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It is our aim, our ambition, our aspiration even, to build our Journal worthily and well, not for the hour only, but for future years; for the few men in the forefront of an enduring and a laborious art; for the disciplined ranks of a distinguished profession; for the young men—Architects to be—and for all who love a clustered column or a flying buttress, a traceried window or a Greek frieze; for the man, too, who honestly plumbs a jamb. . . . .

CAXTON HOUSE, WESTMINSTER.

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Fire Prevention at St. Paul's Cathedral.

The accounts that have appeared in the daily Press with respect to the new scheme of fire-protection for St. Paul's Cathedral are, we are informed, unauthentic. It is true that a scheme is under consideration, but the details have not yet been made public. The generalisation, however, cannot be very far wrong. The cathedral is surrounded by tall buildings, many of which are filled with highly inflammable goods. Fires in the district have been fairly frequent, and in some instances have seriously menaced the safety of St. Paul's. The danger is greatly increased by the vast height of the dome, which, while it might easily take fire by having burning materials blown against it, is inaccessible to the fire brigade, who could not raise water so high. Their appliances are not effective beyond a height of seventy or eighty feet, whereas the dome of the cathedral is about 300ft. high. The cathedral, of course, has its own storage tanks, but if these were exhausted ineffectually, London's grandest landmark would melt before the gaze of the awestruck and helpless crowd. In order to prevent such an unspeakable catastrophe, the surveyor of the cathedral is no doubt endeavouring to avail himself of all the resources at command, and, by making use of the high-pressure system he will be able to render the cathedral virtually immune from the ravages of fire; always provided that his well-devised scheme is not crippled for want of funds. In the richest city in the world, and where the existence of that city's noblest building—its veritable *genius loci*—is concerned, the sum required should be obtained without the slightest difficulty.

The Disaster at Newport.

In spite of all that can be done by the exercise of the utmost available knowledge, skill, and foresight, it is seldom indeed that a great constructional work can be carried to completion without the occurrence of some serious accident involving the risk or forfeiture of human life. Indeed, on an engineering work of any considerable magnitude, such accidents are regarded as being incidental and almost inevitable, and complete or comparative immunity from them is nearly always the subject of surprise and congratulation. So puny is man in comparison with the titanic forces he can set in motion, that it would be wonderful if he could ever get them under complete control. The appalling disaster that occurred at Newport, Monmouth, last Friday, is exceptional only in the number of its victims, of whom more than thirty were killed, while some of the survivors will be maimed for life. The accident was of a kind with which builders and contractors are only too familiar. A trench, about 30ft. wide and 60ft. deep, suddenly caved in—from what cause, stringent enquiry may or may not ultimately reveal. Although, as the result of very frequent accidents, very special attention has been given to the timbering of trenches, and collapse is consequently now far less frequent than it used to be, there is always the haunting fear that some unknown characteristic of the soil, some undetected weakness of the walling or strutting materials, or some thoughtless action on the part of the users, may nullify the most elaborate precautions and produce most lamentable disaster. That the toll of human life exacted by constructional works is far less than that imposed by railway and motor accidents, and in coal-getting, is but a melancholy consolation, and will not relax in the slightest degree the humane, strenuous, and persistent effort to reduce risks to a minimum.

Art and Dogma.

The Bath Street controversy has given rise to discussion of an interesting side issue. According to Mr. Eustace Balfour, F.S.A., F.R.I.B.A., the chairman of the Baths Committee of Bath has written "an amazing sentence" involving "a dogmatic statement of the proportions which should govern Ionic columns." Mr. Balfour points out that "there is no rule of architectural proportion except that of taste and judgment. The proportions of a column are dependent quite as much upon its material and the weight which it has to carry, as upon any authority of Classical or Renaissance times." He thereupon suggests taht Vitruvius should be read in the light of Palladio, which, in any circumstances, is excellent advice. But in the chairman's sentence there is surely nothing that deserves the strong adjective "amazing," unless we are to take that much-abused word in its modern or newspaper-placard sense, and to consider that, by habitual misuse, it has lost its original force and thrill. Possibly the chairman is still under bondage to the precisians who thought that the study of the Orders was an exact science, and who refused to be shaken in that belief by the ascertainments of Messrs. Stuart and Revett and the late Mr. Penrose. The rigid adherents to diameter theories have been perhaps subject to some confusion of thought. Seeing that, for instance, the Ionic differed from the Doric in being more slender in relation to its height, they may have thought it convenient to find in each case a fixed standard of proportion, or absolute ratio; unmindful that, though there may be a good deal of truth in the allegation that "science is measurement," more liberty is demanded by art. The builders of the Early Christian churches seem to have gone to the opposite extreme. In appropriating columns from the ruins of basilicæ, they seemed to care not a jot for proportion. If a column was too tall, they simply cut it down; if it was too short, they mounted it on a pedestal. Their example is only less exasperating than that of the dogmatic rule-of-proportion school because, unlike the latter, they were usually governed by necessity.

Land Values and Buried Treasure.

Italy also has, or has had, its land-value problem; and, as with us, there has been hot controversy on the question of ungotten treasures. The archæologists desired a law declaring that a landowner possessed no archæological property beneath the soil, or, in other words, no right whatever to antiquities found in excavation, and that he could only claim compensation for loss or damage done to his land by the process of excavation. The law, however, as recently amended, deals more tenderly with the landowner, giving him a fourth part of the value of the antiquities discovered. On another point the archæologists have scored heavily. It has been decided that in assessing the value of the land expropriated by the State for excavation no account is to be taken of the presumed value of antiquities that may be found beneath. This alteration is probably a direct consequence of the impossibilist attitude of certain holders. Hitherto, for instance, it has been impossible to expropriate the unexplored portions of the site of Herculaneum owing to the fabulous price demanded by the owners. In this and in other instances, private interests, though duly regarded, will no longer be allowed to obstruct research that may put the world in possession of discoveries of vast importance to art, architecture, and archæology. The value of this concession may be illustrated from a recent instance. An hotel keeper who had received permission to make excavations on private property at Pompeii has laid bare the remains of a large villa, containing a dining-room, in which there are frescoes of exquisite workmanship, representing Silenus giving drink to a thirsty man—a subject that must have hugely delighted the archæologically inclined Boniface—an Ariadne, and a winged Victory about to strike a vanquished woman, for whom a third woman is interceding. Here the Government has intervened, stopping the excavations, and prohibiting the removal of the frescoes. The new law forbids all irresponsible traffic in art treasures. In England we have, of course, the law of treasure trove; would also that we had an art-sensitive State!

Londonderry's Level Lump Sum. The corporation of the historical city of Londonderry seems to hold peculiar views on the subject of contracts, and it clings to them with all the tenacity that one might expect from the descendants of the heroes of the famous siege. The Guildhall is to be rebuilt, and the corporation doggedly insist on having "a lump-sum contract" for the job. So far as we can gather from a full report of a protracted debate on the subject, the worthy burgesses of Derry think that their interests will best be served if they can get a contractor to state that he will do the work for a rigidly fixed sum, with all extras barred. In vain the Architect, the Town Clerk, and the City Surveyor indicated that more latitude was desirable. The corporation seemed to be infatuated with the lump-sum theory. Even after the very careful explanations of their expert advisers, these City Fathers remained obdurate. In vain they were warned that the application of Medo-Persic rules to building operations might lead to expensive litigation, and that, in any case, to pin down the contractor to a lump sum was to handicap him to their own detriment. The architect, easily more wise than his dogmatic employers, had set down a provisional sum for ventilation. This they resented. In their view a specification must be definite and final in every item, and complete down to the most minute particular. Otherwise how could one arrive at an inviolable lump sum? To comment on such an absurd attitude would be mere waste of words. Londonderry corporation should buy their Guildhall ready-made. It is positively the only way in which to secure a bargain on the lump sum theory.

The Patriarchitect. The subjects that were under discussion at the Congress of French Architects at Toulouse are, from our insular point of view, chiefly interesting for their incidental revelation of certain points that are refreshingly novel. It became obvious, for instance, from the paper and discussion on assurance against professional risks, that the French architect is more subject to pains and penalties than is his professional brother in this country, and that, unless M. Gouault has miscalculated or has been misreported, the total amount of the premiums paid by French architects for assurance against such exactions is 500,000 francs, which is estimated as representing two per cent. of the architect's fees. Apparently the architect of a French building is held accountable for everything that goes wrong; and, as if this burden of plenary responsibility were insufficient, the architect must needs take upon himself the solution of the apprenticeship difficulty—a matter that our own architectural societies would regard as being the purely domestic concern of the builders. The French architect, however, seems to be regarded as the patriarch or patriarchitect of each tribe or clan of builders — the real *architecton* or chief builder—to whom all the rest may confidently look for both professional and paternal guidance. So was it in these islands in the days of old; but we seem to be getting further and further away from the old traditions. The fissures are not only widening, but increasing in numbers; the newest "split" being that of the architectural assistants.

Bulls. He that is not grateful for a bull is as fit for strategies and treasons as the man that hath not music in his soul. We hasten, therefore, to share our innocent joy in rather a neat one that appeared in a newspaper description of the Birmingham University Buildings. The writer descants upon the height and beauty of the clock tower, which is to commemorate the name of the Right Hon. Joseph Chamberlain, who has played so strenuous and so effectual a part in the founding of the University. The tower, the writer says proudly, is conspicuous for miles around. He adds, immediately, that the University buildings completely realise Mr. Chamberlain's ideal as "something that is not to be seen anywhere else." Cart-horses should not drag from us the source of this delectable bull. A somewhat similar infelicity of juxtaposition hardly attains to the dimensions of a full-grown bull, although it comes from Cork. "The fifties introduced [to Cork] the romantic school, its chief exponent being William Atkins, who designed the Lunatic Asylum. . . ."

House Pride. Once we were considered to be a purse-proud people. Now, according to the "Spectator," we are becoming house-proud, which is far better. "House-pride burns to-day as it has never burnt before. We have all become exquisitely conscious of our environment." That is good only as far as it goes; for it appears that "a new self-consciousness is destroying the picturesqueness of a thousand villages, and is studding the railway line all over the Home Counties with hideous tiny villas." Why are those tiny houses hideous? Because, apparently, the awakening sensitiveness to art has taken the builders by surprise. They have not yet realised that half-a-century of education has given birth to a strong feeling for beauty; and that feeling itself, though strong, is no more than rudimentary. It needs training and refining. Here surely a splendid opportunity for mission work presents itself. Formerly the people were stonily indifferent to the architectural amenities of their dwellings. The stolid householder was a veritable Gallio, caring for none of these things. Now, it would seem, he is in a most responsive mood, and would gladly render his house beautiful within and without if only he knew how. The better-class surburban dweller has already got hold of the gospel. He lives in a house that is by no means hideous in its construction or in its plenishings. It is not impossible that his example will yet percolate to the lower strata. Then we shall get architecture in the humblest dwellings.

MODERN ECCLESIASTICAL ARCHITECTURE.

By G. Gilbert Scott.

At the fourth ordinary meeting of the Architectural Society of the University of Liverpool, held on Thursday, June 10th, Mr. G. Gilbert Scott read a paper on "The Problem of Style in Modern Ecclesiastical Architecture."

In order to understand the present state of chaos, Mr. Scott said, it must be borne in mind that the widely divergent and often conflicting views held by those architects who honestly have the improvement and advancement of modern architecture at heart may be broadly divided into two main schools of thought—that held by a majority which is striving to pick up the broken threads of a lost tradition, and is attempting to evolve a new phase of the Renaissance, and that held by a minority, working in an entirely different direction. Mr. Scott said that, as a member of that minority, he felt it incumbent upon himself to explain and justify his position. In such a justification it was obviously necessary to put aside those individual preferences which have arisen merely from natural inclination or initial training, and to consider the whole question of the relative possibilities of modern Gothic and Renaissance architecture for ecclesiastical work, on the merits of actual evidence alone. In considering the two most prominent styles of our time, whatever may be urged against the legitimacy of Gothic, on the grounds of its being exotic, can with equal force be applied to any other style that has no claim to the title of Renaissance, the naturally predominant modern manner.

An examination of the whole case, Mr. Scott contended, inevitably leads to the discovery of the inadequacy of Gothic for the secular requirements of present-day civilisation; but in one branch of architecture, church-building, the case is entirely reversed. The validity of this contention Mr. Scott based on the hypothesis that achitecture, to be good, must be logical, and to be logical must reflect the conditions and feelings of contemporary life. To obtain a true answer to the question, "Is the Gothic style exotic?" it is necessary first to observe the distinctive characteristics of the Gothic style so that it may be possible to ascertain what special qualities it is best able to express, and then to make some excursion into the realms of sociology in order to examine the forces of modern life of which architecture should be the unconscious reflection.

The generally accepted superiority of Gothic is its power to express true religious feeling, and the current belief that it undoubtedly possesses characteristics appertaining to the Christian religion, which may not be claimed by the other style, cannot wholly be ascribed to association—to the fact that we have so long been accustomed to seeing churches in Gothic that unconsciously we associate the style with religion, and imagine it to possess an atmosphere of sanctity that is in no sense an innate quality of the style itself.

Rather it is precisely this quality which distinguishes it from Renaissance ecclesiastical work. In the latter the suppression of all spontaneity, the calm self-conscious intellectuality always evident, are more in keeping with the self-satisfied worshipper of science than with the humble and self-effacing spirit of the Christian. A fine Renaissance church appears a product of the intellect, a fine Gothic church a product of emotion. And in this lies the superiority of the Gothic style in religious appropriateness. The interior of a Renaissance cathedral seems more suitable as a setting for the tombs of national heroes than for the purposes of Christian worship, and, for this reason the Wellington monument in St. Paul's—which Mr. Scott considered the finest tomb in the country—is the right thing in the right place, and thoroughly in keeping with the very worldly spirit of the whole

—the tattered and war-stained flags, the coats of arms, and the general irreligiously impressive atmosphere of imperial magnificence.

But the question now arises, is the capability of the Gothic style for devotional feeling one which the requirements of modern civilisation actually demand for their full expression? Considered in relation to other phases of social life, is religion in its present position and character a living force, one to be taken into account and sufficiently strong to possess an influence upon contemporary architecture? To a limited extent it would appear undoubtedly to be so. The tolerant indifference of the majority is opposed by the earnestness of a minority to whom religion is a reality, and who are consequently anxious for it to be enshrined in a befitting and appropriate manner in structures that reveal their true purpose.

And as modern architecture, to be of genuine value, must express modern conditions and requirements, so it follows that the definite existence of this minority may be taken as a complete justification for the employment of Gothic in church design.

But the character of such work must, to be worthy of consideration, be free from all that affectation which, since the pre-Raphaelite movement, has in many quarters become synonymous with Art, and must be thoroughly modern in spirit. Mediæval work, beautiful as it is, is an impossibility in these days of individuality in Art. It was more the product of Guilds than of single master-minds, and in consequence its chief characteristic is the extraordinarily free and irresponsibly random manner of design, resulting in an unconscious picturesqueness, which is often increased by the inconsequence with which later additions were made; so that almost all mediæval buildings appear to have been put together partly by accident, and with so little regard to the relation of the various parts that no strong controlling quality of design, in the strictest sense of the word, is anywhere evident—there is no evidence of a supreme personality.

Chartres Cathedral, however, really possesses this quality, and for that reason Mr. Scott considered it to be the finest in Europe, and the only Gothic cathedral which ever inspired him with any enthusiasm; and to those people who sometimes expressed the supposition that he had studied a great number of old cathedrals and derived much inspiration from them, he said he was obliged to confess that he had never seen a cathedral that really fired his enthusiasm until he saw Chartres four years after the production of his design for Liverpool Cathedral. In this notable exception of Chartres, a strong personality dominates the whole composition: the subsidiary parts, such as windows and buttresses, are all designed to help the expression of the one great abstract idea. The scale is heroic, so that the work is one of those instances of the grand manner so very rare in Gothic. Though the majority of mediæval cathedrals are large in themselves, they are yet made up almost invariably of details on quite an unimposing scale, and the feeling of immensity that ought to be produced is frittered away in the smallness and trivial subdivision of the parts. Beauvais may be taken as a typical example of this, and it is instructive to compare its effect with that of Chartres. To obtain largeness of scale, a most careful and reticent treatment of the component parts of the whole is essential: they must not be obscured in a multitude of petty decorative features and frivolous little pinnacles and crockets, but all unnecessary detail must be eliminated, till only such is left as is essential to the design and contributes to the impact which the whole makes upon the mind.

But the true Gothic feeling is not to be found in our heartlessly restored cathedrals that are now nearly all dry bones and cast-iron, soulless museum relics. It is to be found rather in our little out-of-the-way, unknown and unrestored village churches. From these the spirit and not the mere forms of the style are to be learnt, and once that has been captured by the architect, it is possible for him to design with such freedom that imitation of mediæval work becomes more of a labour than the working out of new ideas. But in these days the style has comparatively few architectural exponents, and its very existence is due in large measure to the natural preference shown for it by the clergy and archæological laymen.

In studying the Gothic Revival, it is interesting to observe how in the first period of the movement knowledge of mediæval forms was considered the essential for a true interpretation of the style; and as the movement progressed the spirit of the style began to be discovered, and pedantic accuracy of form to be ousted from its supreme position, so that in the second period, the period of Bodley, Garner, George Gilbert Scott, and others, the work was distinguished by a happy balance of scholarship and artistic feeling; while in the third and present period, archæological knowledge occupies a position of comparatively slight importance, the artists preferring to rely solely upon their own feelings—usually with disastrous results. In their anxiety to avoid archæology, they rush to the other extreme and produce very shallow work.

The originators of the revival were men inspired with almost fanatical enthusiasm, and enjoying the most enviable opportunities. Yet the work of the period is undeniably dull and unconvincing. The true inwardness of the style was not grasped: the outward forms were seized upon as essentials, and archæology so strongly developed that it began to be mistaken for the art of design—an error which still persists amongst laymen who have taken up the study of

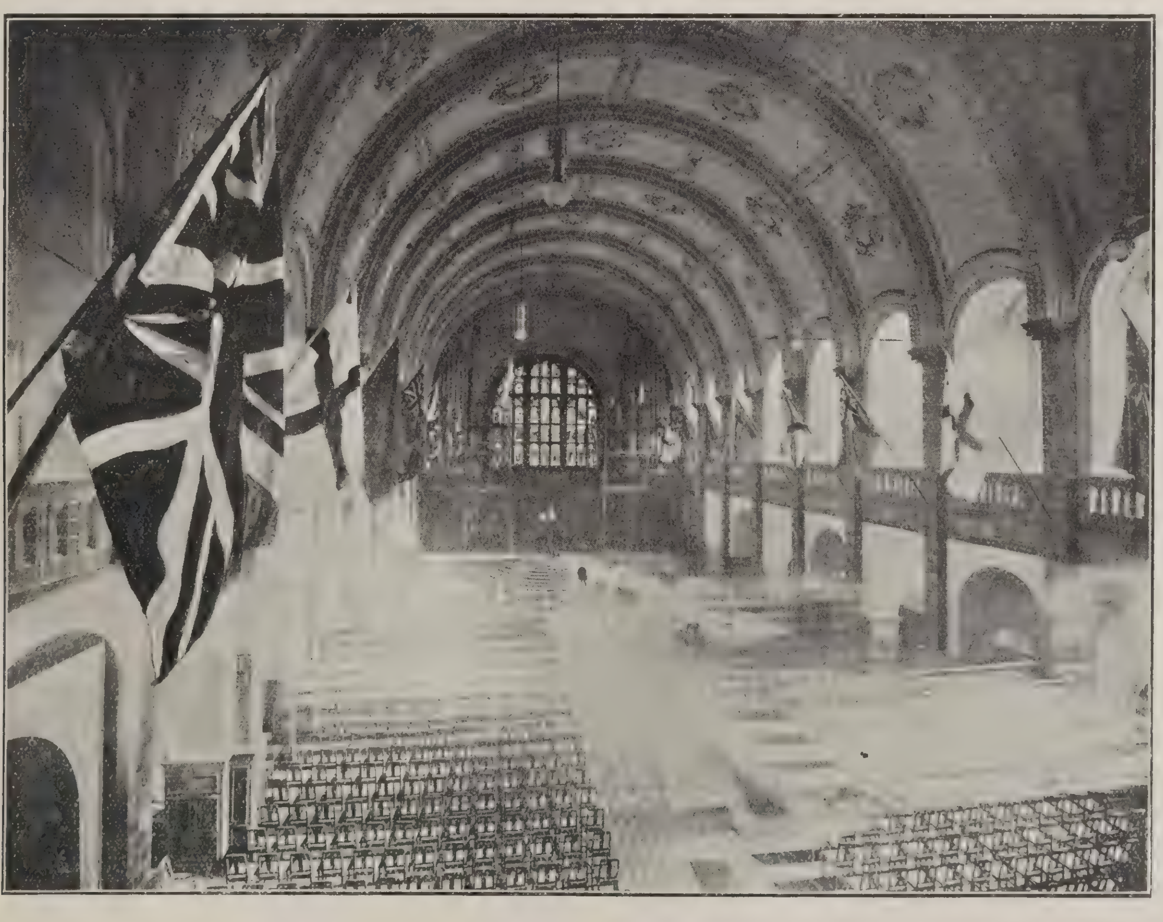


Photo: Topical.

BIRMINGHAM UNIVERSITY: GREAT HALL. SIR ASTON WEBB, C.B., R.A., F.R.I.B.A., AND E. INGRESS BELL, ARCHITECTS.

The Great Hall, in which the King performs the opening ceremony to-day, runs north and south, and at the south end there are a stained glass window, the gift of Sir John Holder, and a fine organ, which has been presented by the family of the late Mr. Charles Harding.

mediæval work as a hobby. Lack of any depth of insight leads them to attach importance to externals, and having the history of the style at their finger-tips, they fancy that they know all that there is to be known about it, and proceed with extraordinary confidence to sit in judgment on any modern design that may come to their notice.

The extreme difficulty of producing really good modern ecclesiastical Gothic lies largely in the appalling freedom of the style—a freedom which quickly betrays the incompetent artist: there are no orders for him to fall back upon, no recognised proportions to use as a foundation upon which to base his design. He must rely solely and entirely upon his own sense of fitness. The repetition to a motif a few times constitutes a crime. A man may use an Ionic order all his life and not be accused of repeating himself. Yet let him occasionally repeat a particular Gothic column and arch, and he stands condemned for poverty of invention and lack of resource. Moreover, it is allowable to follow a type more closely in Renaissance work than is permitted in Gothic, with the result that architects erecting buildings, say in the Queen Anne manner, may copy a type very closely indeed, and still escape the accusation of plagiarism. Mr. Scott declared that, in short, after designing both in the Gothic and Renaissance manner, he had come to the conclusion that it is more difficult to do good work in the former than in the latter.

Mr. Scott concluded his lecture by discussing the possibility of evolving a certain type of Renaissance church that would possess the essential religious atmosphere—a dream which he thought would probably prove too Utopian for actual realisation. Brunelleschi's interior of the Badia at Fiesole is imbued with poetic charm, the plain plaster walls and the simple details accentuating rather than concealing the construction, contributing to produce a wonderfully appropriate and impressive feeling of religion. The work contains a seed that never grew or blossomed in subsequent development, and Mr. Scott expressed the hope of having at some time the opportunity of trying its possibilities.

The lecture was followed by a discussion on Scale, in which Professor Reilly and Professor Adshead took part.

A NEW FIRE EXTINGUISHER.

All who are interested in the question of fire extinction are familiar with the dangers and difficulty inherent to combating conflagrations where petroleum, gasoline, benzine, or other liquids lighter than water, are involved. As is well known, the attempt to extinguish with streams of water in such cases results usually in a spreading of the inflammable liquid, an increase of the area of combustion, and a greater intensity of conflagration. The use of steam or of a current of inert gas is available only for incipient conflagrations in well-closed rooms. It presupposes, also, the permanent location, on the spot, of stationary apparatus for the purpose. According to the American Consul at Chemnitz, a distinct step forward in the means of battling with such conditions has been made in Germany, where the use of a tenacious foam, dissipated with difficulty, has been found of great value in cutting off the supply of air necessary to maintain combustion, and thus extinguishing flame. The method and the requisite apparatus have been perfected at Salzkotten, near Minden, in Prussia, and have been submitted to exhaustive tests by the heads of the fire brigade and others interested in the question of protection against the dangers from combustible liquids.

The apparatus employed consists of a simple metal cylinder provided with a long spout, and divided into two chambers. One chamber is charged with an aqueous solution of potash alum and sodium sulphate, the other with a similar solution of sodium bicarbonate, sodium sulphate, and liquorice extract. The cylinder is so arranged that, on being inclined or reversed, the two solutions mingle as they issue from the spout.

There is no pressure evolved, and consequently the liquid does not issue with sufficient force to cause a spattering of the burning hydrocarbon upon which it may be poured. The result of the chemical reaction between the alum and the bicarbonate is a prompt evolution of carbon dioxide which, in contact with the liquorice solution, forms an exceedingly stiff and persistent foam. Such a layer of foam, containing an inert gas upon the surface of a burning liquid, cuts off all access of air, and combustion necessarily ceases. The temperature of the liquid may have reached a sufficiently high point, so that, through evaporation bubbles of the vaporised hydrocarbon rise, for a time, through the stratum of foam, and tongues of flame flutter over its surface. These soon cease, for simultaneously with the evolution of the carbon dioxide, there is a loss of latent heat, the temperature of the foam-yielding solution falls, and this, in turn, cools down the combustible liquid. The solution acts thus in a double manner as a protective agent.

Among the numerous tests to which the apparatus has been submitted by the heads of fire departments in Germany, the following, by the head of the Tanover department, may be mentioned. An iron vessel, five and-a-half by two and a-half feet in size, and four inches deep, received a charge of eighteen gallons of benzine. Benzine was likewise poured on the ground where the vessel rested. The liquid in the vessel, and outside the same, was lighted, and allowed to burn for three minutes. The contents of two foam extinguishers were then allowed to flow over the whole. Combustion was promptly arrested. The superincumbent layer of foam was then removed, and the benzine lighted anew. The attempt was now made to extinguish the flames by means of water, first with a simple, portable house extinguisher, and then with the use of the city water supply, issuing from a two-inch hose. In neither case could the fire be extinguished. On the contrary, the area of combustion was rapidly extended, until it covered over forty square yards. It was then necessary to discontinue the use of the hose, on account of the danger to the buildings surrounding the court in which the experiment was conducted.

The success attendant upon this and similar tests has led to the conviction among German authorities on protection against fire, that the foam extinguisher is capable of rendering valuable service in all places where combustible liquids are stored, and especially in automobile garages, and motor yachts. The use of liquid fuel for rapid locomotion by land, water, and air is extending so rapidly that the new protective, it is said, will meet a distinct need.

Complete plans for the new Quebec Bridge have now been submitted for the approval of the American Government. The failure of the partly erected structure having been caused by the insufficient strength of the lower chords, it is proposed to substitute a proportion of nickel steel for the carbon steel previously used. It is asserted that if bridges are to be constructed of a greater span than 2,000ft., nickel steel must be adopted.

* * *

Mr. Alfred Walter Bayes, A.R.E., who was killed by a motor-car accident, was born in 1832, and had intended to become an architect, but was attracted to the pictorial side of art. His scenes from the history of the Pilgrim Fathers, such as "The First Sunday in New England," and "The Departure of the Mayflower," became very popular. Mr. Bayes had contributed to the Royal Academy since 1858, and he was an Associate of the Royal Society of Painter-etchers. He had been for some time engaged on etchings of "Old and Vanishing London."

Correspondence.

[*The Editor declines responsibility for the statements made by correspondents.*]

Middlesbrough Library Competition.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—At the suggestion of certain architects, the memorial and letter in reference to the above competition was sent to the Competitions Committee of the R.I.B.A., the hope being expressed that they would take up the matter strongly. To this they replied as follows:—

"The Competitions Committee have considered the objections to the assessor's award raised in your memorial to the Middlesbrough Council.

"It appears that the most serious objections to the award in your views are:—

"(1) The position of the lending library.

"(2) The area devoted to patents library, etc.

"The other objections do not appear to be of any great importance.

"With regard to the first, the committee is of opinion that the clause in the instructions defining the position of the lending library is somewhat ambiguous, but it does not seem to necessitate its actually abutting on the dwelling-houses. The suggestion is that it should be on that part of the block of land adjoining the dwelling-houses.

"Your second objection as to the area of the patents library seems to be due to a misapprehension of the schedule of accommodation given in the instructions. The 1,739ft. required includes corridors, lavatories, etc.

"An examination of the successful plan will show that the door from the newsroom to the entrance hall is a private passdoor, and not for the use of the public.

"The Competitions Committee consider that when an assessor has been regularly appointed it would be well to bring any objection to the award before them in preference to approaching the promoters directly."

To which we replied disagreeing with their interpretation of the conditions, and laid the whole of the correspondence before the president of the R.I.B.A., at the same time sending a copy of same to the "Architect," "British Architect," "Builder," "Building News," and "Builders' Journal," all of whom published it in last week's issue, with the exception of the "Builder," which had an article in support of the protest.

The president's reply, per the secretary R.I.B.A., was as follows:—

"The president of the Royal Institute of British Architects desires me to thank you for your letter. He has very carefully considered the terms of the protest which you have sent to him, together with the conditions and the successful design, and he has come to the conclusion that the decision arrived at by the Competitions Committee of the Royal Institute is a sound one."

We have replied as follows:—

"We have to acknowledge your letter of the 26th inst., but would point out that you appear to have misunderstood our intention in forwarding you the protest in question.

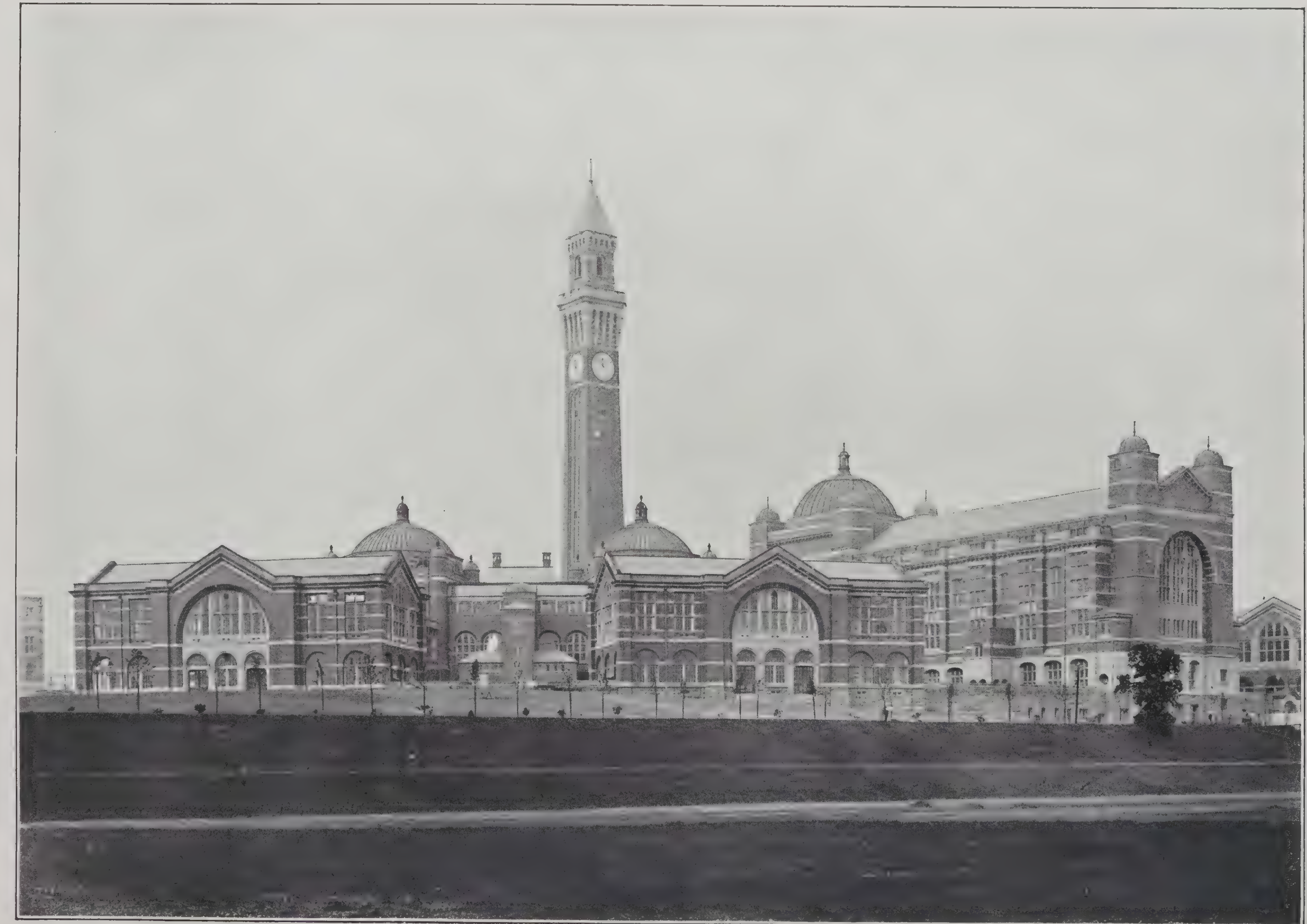
"This was sent to you, as head of the Institute, with the object of having the matter thoroughly investigated by the Council of the Royal Institute, and not by you personally (see clauses 3 and 4 in our letter), and we shall be obliged if you will be good enough to bring the matter before your Council at the earliest moment."

Yours faithfully,

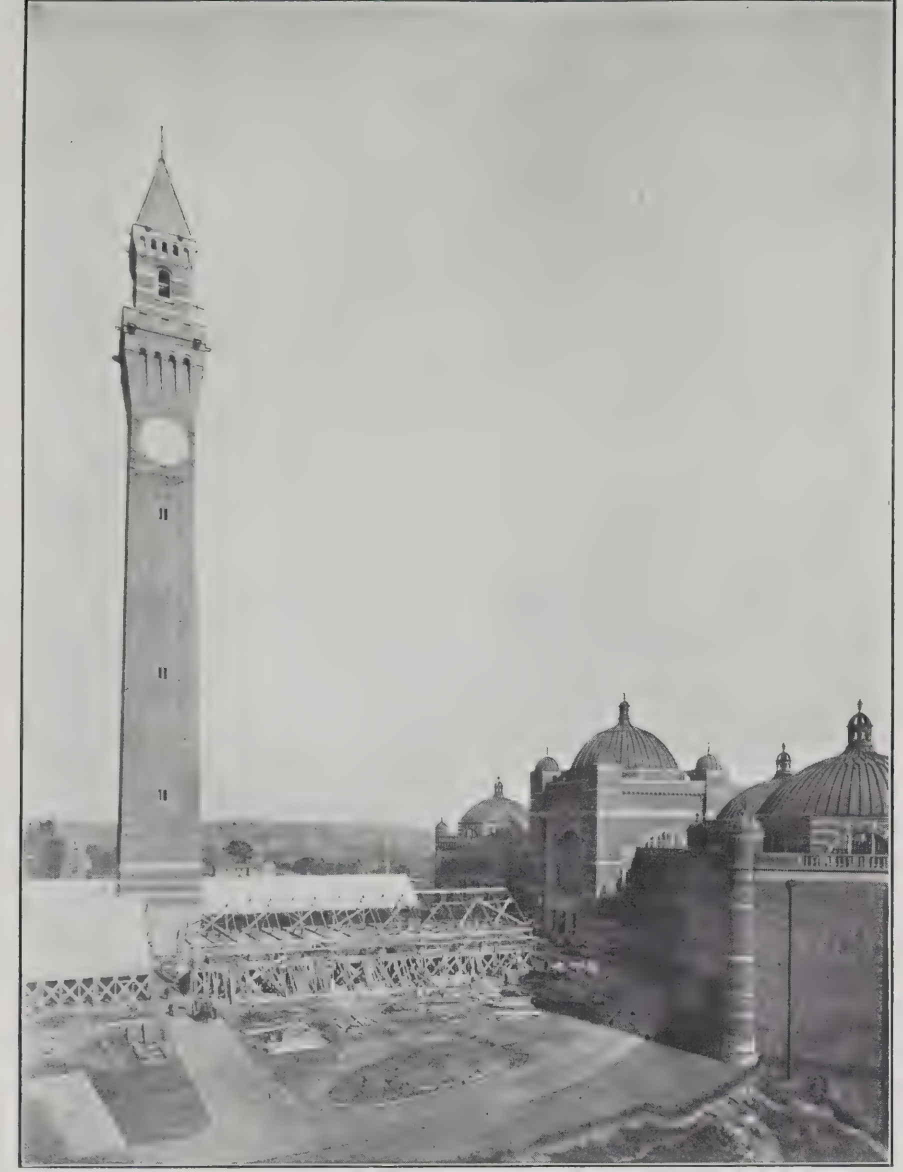
HOSKINS AND BROWN, Court Chambers, Darlington,
KITCHING AND LEE, Houndgate Chambers, Darlington,
W. H. BOURNE, A.R.I.B.A., Houndgate Chambers, Darlington.
June 29th, 1909.

At a recent meeting of the Council of the Quantity Surveyors' Association, Mr. H. T. A. Chidgey was elected president for the ensuing year, and Messrs. S. Chatfeild Clarke, and J. S. Parmenter, vice-presidents.

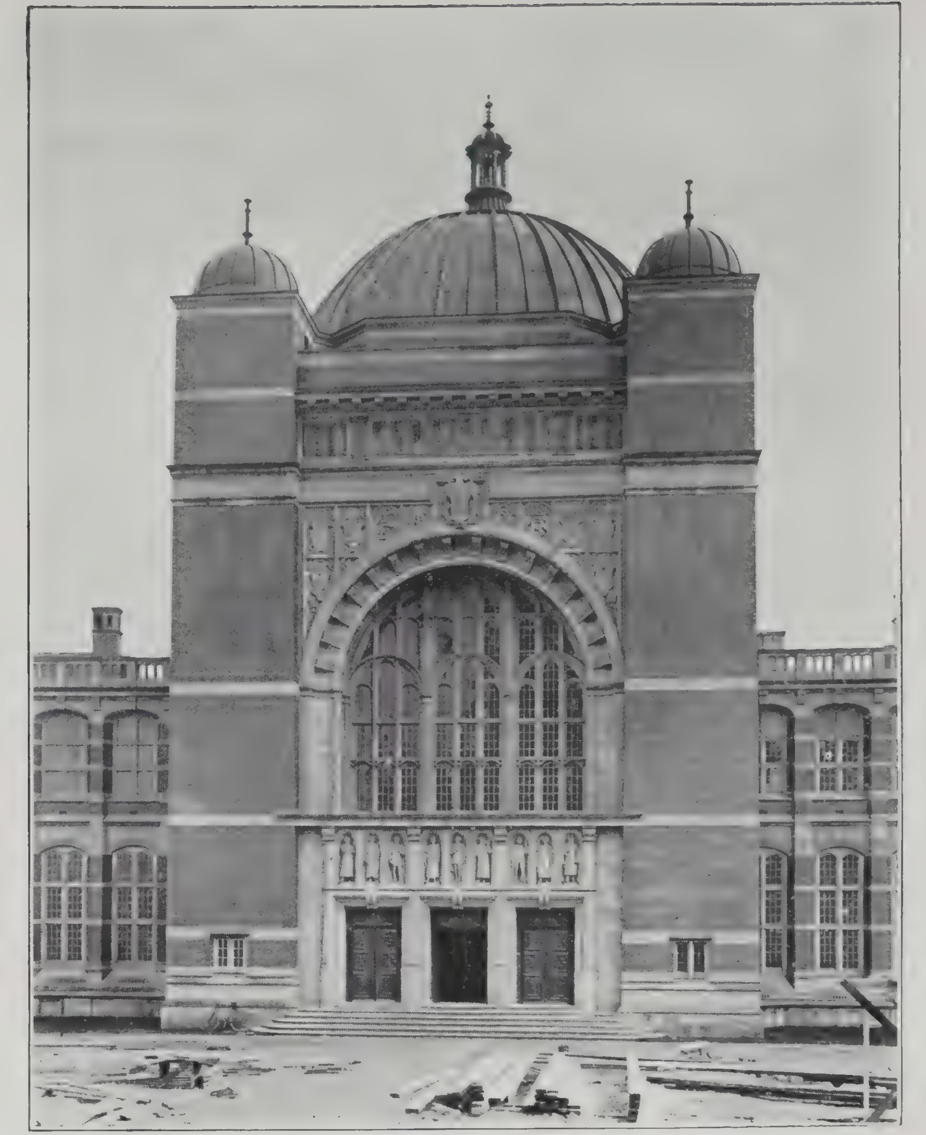
LIBRARY
OF THE
UNIVERSITY OF ILLINOIS



General View of the Buildings from the Back.



General View of the Main Façade and the Chamberlain Tower.



The Main Entrance.

[Photos: Topical Press.

BIRMINGHAM UNIVERSITY. SIR ASTON WEBB, C.B., R.A., AND E. INGRESS BELL, F.R.I.B.A., ARCHITECTS

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
July 9	PUBLIC BATHS, WOOD GREEN Architects desirous of competing are invited to send full particulars of any recent public baths designed by them, the erection of which they have supervised, stating general accommodation, cost, etc., to W. P. Harding, Clerk to the U.D. Council, Town Hall, Wood Green, not later than July 9th. From those thus applying a selection of not more than 15 Architects will be made, who will be invited to compete on certain conditions and particulars. Premiums of £52 10s., £26 5s., and £15 15s. will be awarded to the designs placed by the Assessor as first, second and third. Assessor: Mr. A. Hessell Tiltman, F.R.I.B.A. Cost not exceeding £8,000. The Council reserve to themselves the right of selecting from the premiated designs the one eventually to be erected.
July 9	STOKE-UPON-TRENT. Additions to Town Hall including large hall to seat 3,000 people, police court, etc. Premiums of £100 and £50 for second and third designs respectively. Assessor nominated by Pres. R.I.B.A. Conditions and particulars from Jno. B. Ashwell, Town Clerk, Town Hall, Stoke-on-Trent,
July 17	NEW PUBLIC BUILDINGS, BURSLEM. The Architect whose design is placed first by the Assessor will be appointed to carry out the work. Premiums of £100 and £75 to authors of second and third designs, respectively, Conditions and plan of site from F. Bettany, Borough Surveyor. Deposit, £2 2s., returnable on receipt of *bona fide* design.
July 19	WHITLEY BAY PUBLIC ELEMENTARY SCHOOL for 600 scholars, for the County of Northumberland Education Committee. *Limited to Architects practising in the County and in the City and County of Newcastle-on-Tyne.* Particulars and plan of site from C. Williams, Secretary to the Education Committee, The Moothall, Newcastle-on-Tyne. Assessor: W.H. Knowles, F.R.I.B.A., F.S.A.
July 30	GRIMSBY TOWN HALL EXTENSION. Estimated cost £26,000. Conditions of competition sent to any applicant on receipt of a stamped addressed foolscap envelope. Full particulars, schedule of requirements, plans of existing buildings, etc., on receipt of deposit £2 (cheques to be made payable to Frank Stephenson, Borough Treasurer), which deposit will be returned to those who send in designs, or if the whole of the particulars are sent back within ten days from the date of their receipt by the applicant. Premiums of £250, £150 and £100. An Architect of eminence will advise in conjunction with the Borough Engineer. Applications to be made to the latter, H. G. Whyatt, Assoc.M.Inst.C.E., Town Hall, Grimsby.
July 31	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
Sept. 1	BRANCH LIBRARY, NEW CROSS, for Deptford Borough Council. Limited to Architects practising in the City or the County of London. Assessor: J. S. Gibson, Vice Pres. R.I.B.A. Premiums, £52 10s., £26 5s., and £10 10s., for three selected designs, and will be awarded in accordance with the conditions contained in the instructions to competitors. Site plan and copy of instruction from Vivian Orchard, Town Hall, New Cross Road, S.E. Deposit £1 1s., refunded on receipt of *bona fide* design or if instructions are returned within 21 days.

New Library, Liscard.

The assessor in this competition, Mr. G. H. Willoughby, F.R.I.B.A., of Manchester, has given his award as follows:—First, Messrs. R. B. MacColl and G. E. Tonge, Bolton and Southport; second (bracketed), Mr. J. R. Earnshaw, Manchester; Messrs. Packer, Drewitt and Drewitt, Southport; Messrs. Appleyard and Quiggin, Liverpool; Messrs. Deacon and Horsburgh, Liverpool; Messrs. Sproat and Warwick, Liverpool.

BIRMINGHAM UNIVERSITY.

The new University at Birmingham, which will be opened by the King to-morrow (Thursday, July 7th), has, over the main entrance, statues of Shakespeare, Plato, Virgil, Michael Angelo, Faraday, Darwin, Newton, Beethoven, and James Watt—a sufficiently catholic, not to say heterogeneous, collection, representing the very varied interests and activities of the University. The floor of the dignified entrance hall is in dove Pentelikon and Sicilian marble, and the walls are adorned with Breche Violette columns, having grande antique bases and skirtings, and statuary caps. The columns support a circular promenade, above which is the dome with whispering gallery. The buildings comprise the following blocks: Mining and metallurgy, civil and electrical engineering, mechanical engineering, chemistry, physics; and there are foundries, forges, buildings for large furnaces, and experimental plant in connection with the metallurgical department, and an experimental mine. The clock tower, which is 325ft. high, and in which there is a peal of bells, is to be called the Chamberlain Tower, and is a conspicuous landmark for miles round.

The buildings may be thought to lack something of the grace and serenity of the older university buildings in the kingdom, but it must be remembered that, as indicated in the description given above, Birmingham University will fulfil many purposes that were undreamt of in constituting and designing the older seats of learning. Its objects are largely utilitarian, and the buildings certainly express their purpose, and thus fulfil one of the cardinal conditions of good design.

The architects are Sir Aston Webb, C.B., R.A., F.R.I.B.A., and Mr. Edward Ingress Bell, F.R.I.B.A., the chief contractor being Mr. Rowbotham.

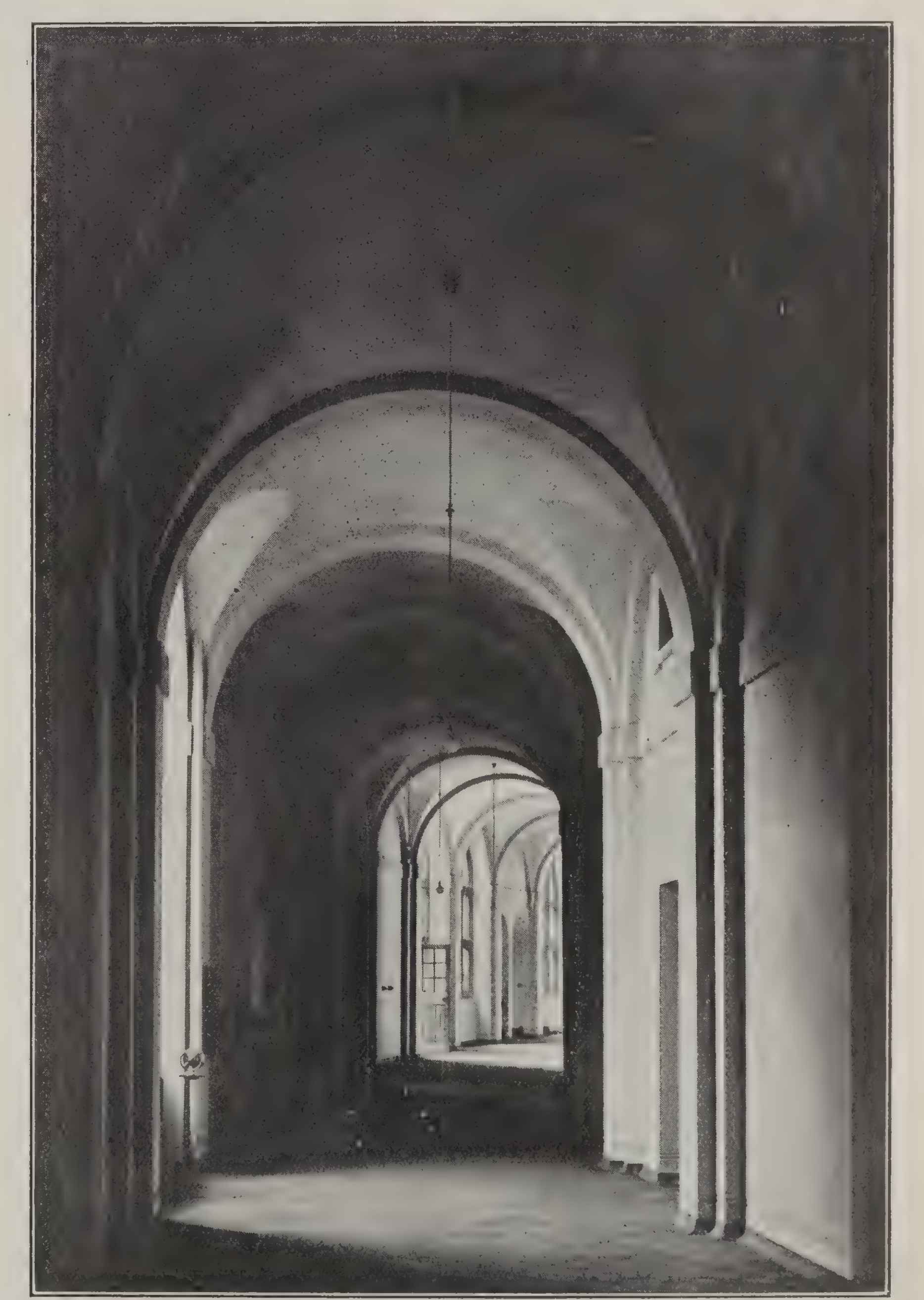


Photo: Topical.

BIRMINGHAM UNIVERSITY, MAIN CORRIDOR. SIR ASTON WEBB, C.B., R.A., F.R.I.B.A., AND E. INGRESS BELL, F.R.I.B.A., ARCHITECTS.

In designing the main corridor, the Architects have avoided, on the one hand, the baldness of a mere passage, and, on the other, the tendency to ecclesiastical style that is exceedingly tempting. This corridor, however, possesses character of its own, and is of dignified and graceful proportions.

Photo: Topical.

BIRMINGHAM UNIVERSITY; ENTRANCE HALL. SIR ASTON WEBB, C.B., R.A., F.R.I.B.A., AND E. INGRESS BELL, F.R.I.B.A., ARCHITECTS.

The Entrance Hall forms a fitting introduction to the Great Hall opening out of it. The floor is paved with dove Pentelikon and Sicilian marble, the walls are adorned with Breche Violette columns with Grande Antique bases and skirtings and statuary caps. The columne support a circular promenade, and above is the dome with whispering gallery.

REINFORCED CONCRETE AND FIRE RESISTANCE.

Numerous fire tests have been made to determine both the resistance of concrete to actual test, and also the depth to which the reinforcement must be embedded to prevent its being damaged. The maximum depth of pitting observed by Mr. Leonard C. Wason in actual fire tests, where a temperature of 1700 degrees F. or more has been maintained for a period of five hours, has been in either walls or ceilings one inch to one and one-half inches. Also by the examination of actual conflagrations, such as that at Baltimore, and elsewhere, it has been apparent that the prearranged fire tests are more severe in the results shown by the structure than are actual conflagrations. Therefore, Mr. Wason argues, if we can protect the materials against damage in a prearranged test, they will stand any actual service. The consensus of opinion of engineers is that there should be at least one inch of concrete between the nearest point of a bar to the ceiling in panels, at least two inches below the ceiling in beams and girders, and also two inches of concrete outside the vertical bars in columns. In designing columns, it is common to figure only that area of column inside the vertical bars when hooped as carrying the load, or if hoops are omitted, and but light reinforcement is used to prevent bending stresses, to add an extra inch beyond that needed to carry the load all around the outside, which might be burned away without endangering the load-carrying capacity of the balance of the column within. If this is burned off, it can be plastered back, giving the column the same fire-resisting qualities as before.

Fire underwriters are always interested in knowing whether a particular structure is properly built or not. There is very little difference in outward appearance between one of perfect construction,—that is, in regard to size and placing of steel, size of members, etc.,—and one which is imperfect, and the only positively sure way to know is either by inspection or by test. There is no type of construction where more painstaking care in providing for every detail is necessary than in reinforced concrete. Concrete is either good or bad. There is no half-way about it, and if bad defects are manifested before the builder is clear of his work, he is usually the one to suffer. A precaution to assist inspection is the setting of the steel rigidly in place before pouring the concrete. The quality of the sand and stone used must be as carefully inspected as the cement, and a sufficiently rich mixture required to allow for inequalities of mixing and placing. With well-graded materials and first-class workmanship, a floor can safely be built with a mixture of one cement, three sand, and six stone, and, as insurance against uneven or poor workmanship, to-day it is quite common to specify a mixture of one, two, four, which, with thoroughly first-class workmanship, gives a stronger result than is necessary, and with ordinary or careless workmanship, ought to give a job which is still strong enough. Incidental to the process of construction while the concrete is still green, and much weaker than it will be with age, it is loaded frequently as heavily as it ever will be in actual service, and always it is loaded sufficiently to give a fair idea of its strength. Where there is any doubt of its strength, load tests can be applied. With these safeguards, in addition to those provided by the engineer, architect, or building department, the underwriters need have no fear that a building they are asked to insure is structurally weak.

As a basis for the proper regulation of construction, Mr. Wason, himself an American, can offer nothing better than the building code recently perfected by a joint committee of American Society of Civil Engineers and other societies, and approved with slight changes by the National Association of Cement Users (U.S.A.).

The other types of fireproof construction which are coming into competition with reinforced concrete are—structural steel encased in concrete (and this, when thoroughly encased from a fireproof standpoint, is similar to an all-concrete building); structural steel frame encased in terra-cotta; and, to a small extent, plaster of Paris and brick have been used in fireproofing steel, but not sufficiently to be worthy of much comment. Thoroughly well-laid brickwork is a good protection to columns, but when cast as arches between beams, it leaves the bottom flange exposed, which is a serious defect. Actual conflagrations have conclusively shown that terra-cotta is not so perfect a fire protection as concrete. This is, in Mr. Wason's opinion, largely due to the fact that its coefficiency of expansion is high, so that it expands to such an extent that when confined between the beams it is crushed, the lower member falling and thus weakening the floor. It is also more susceptible to a combination of fire and water, being to some extent brittle, and cracking when a cold stream strikes a hot surface.

Before concrete will disintegrate when exposed to fire, the large amount of moisture chemically combined in the setting of the cement, being 20 per cent. or 25 per cent. of its weight, has to be driven off by heat, and then the vapour thus driven off has to be evaporated from the pores of the concrete before it becomes sufficiently hot to crumble. The slowness of evaporating this vapour is probably the cause of concrete resisting extremely high temperatures for the brief period of a few hours, while a much lower temperature, if long continued, would ultimately disintegrate it. Cement, Mr. Wason asserts, will resist 500 degrees F. for an indefinite period, while a continuous temperature of over 700 degrees F. is disastrous. The cement coating of the stones of the concrete will resist the attack of fire so long that it is of less consequence whether the stone can be damaged by the fire or not. Thus pure limestone is a most excellent aggregate, and will not decompose until after the cement has done so, and after the cement has gone it is immaterial what aggregate is used, as the work has then failed anyway.

Regarding the cost of this type of construction as compared with others, the large use has proved conclusively that it will compete, because the item of cost is considered paramount in 99 out of every 100 structures. For large buildings the structural frame is almost always cheaper than the steel. Thin curtain walls cannot be built as cheaply, on account of form work, which is constant for a thin wall as well as for a thick one; but if the wall must be 16ins. or more in thickness, concrete is cheaper than brick. In small structures, such as dwelling houses, concrete is materially more expensive than brick or wood, because the form work is more irregular, and because of the greater expense of supervision. This is why it is not commonly used in small dwellings, and probably will never be much used. It has been used, and can be economically used, for large dwelling houses, especially those of simple design, where the form work is nearly as easy of execution as in an office building or mill.

Notes and News.

The first concrete building erected as a private residence in America is, it is believed, that built for the Hon. William Ward at Portchester, N.Y. It was begun in 1875, and completed in 1877. The architect was Mr. Robert Mook of New York. Some of the floors and ceilings were made of reinforced concrete, and this was thirty-four years ago!

* * *

The octocentenary of the building of Southwell Minster was celebrated last week by a diocesan service of commemoration and thanksgiving. The sermon was preached by the Archbishop of York, eighty-eighth in the line of bishops and archbishops, of whom Thomas of Beverley, who directed the building of the Minster, was the twenty-eighth. The date of the commencement of the work is lost, and it was decided to hold the commemoration on the anniversary of the consecration of Thomas of Beverley to the See of York, June 27th, 1109.

* * *

The Northern Architectural Association, of Newcastle-on-Tyne, will hold their annual excursion on Wednesday, July 14th, when Selby and the neighbourhood will be visited. Of course, the Abbey Church will be included, and by the courtesy of Mr. J. Oldrid Scott, F.S.A., the architect for the restoration, the party will be conducted over the work. The party will afterwards drive to Hemingborough Church, which is one of the most interesting in Yorkshire.

The Council of the Royal Sanitary Institute have appointed Mr. Henry Adams, M.Inst.C.E., F.S.I., etc., to represent the Institute at the conference which is being organised by the Engineering Standards Committee to consider the desirability of a standard being adopted for stoneware, fireclay, and other similar pipes.

* * *

The Building Acts Fire Escape Co. have asked us to state that, in order to obtain better facilities for handling the increasing business with which they are being favoured, they have removed from 4, Southampton Row, to 9a, Little James Street, John Street, W.C.

* * *

Mr. R. Stenning, President of the Surveyors' Institution, Mr. J. Carmichael, Past President of the Institute of Builders and the London Master Builders' Association, and Mr. E. B. Ellington, Vice-President of the Institute of Mechanical Engineers and Councillor of the Institute of Civil Engineers, gave evidence on June 28th against parts of the London County Council's General Powers Bill, which is being considered by a Committee of the House of Commons. Owing to the rapidly increasing use of steel frames for buildings, it has been complained by architects, builders, and other persons, that the regulations prescribing the thickness of outer walls are unduly exacting where structures with metal skeletons are concerned. The Bill seeks to meet this objection, but it also proposes to extend the Council's power of regulation to inner walls, and this plan is resisted by the Royal Institute of British Architects, the Surveyors' Institution, the Institution of Civil Engineers, and other bodies. They also object to the insertion of regulations in the Bill, as they contend that such an arrangement would be a bar to the adoption of improvements, and they urge that any regulations made by the County Council should be submitted to the Local Government Board.

Coming Events.

Thursday, July 8th.
London Master Builders' Association, 31 and 32, Bedford Street, Strand, W.C.—Special Council Meeting, 4 p.m.

Wednesday, July 14th.
Northern Architectural Association, 6, Higham Place, Newcastle-on-Tyne.—Annual Excursion, Selby.

Thursday, July 15th.
London Master Builders' Association.—Organisation Committee Meeting, 2.30 p.m., and Council Meeting, 4 p.m.

Monday, July 26th.
Builders' Benevolent Institution.—Annual General Meeting, 4.30, and Committee Meeting, about 5 p.m.

GUILD OF ARCHITECTS' ASSISTANTS.

A well-attended meeting of the Guild of Architects' Assistants was on June 18th held at Cardiff, in the New Law Courts, designed by Messrs. Lanchester and Rickards, to consider the formation of the Guild of Architects' Assistants, Mr. Lumsden presiding.

The Guild of Architects' Assistants was, as our readers are aware, recently formed in London, the object being to remedy certain discontents that have been growing more and more acute in recent years, and have chiefly arisen from the lack of co-ordination and unity between practising architects and their assistants. The object is to protect the interests of properly qualified assistants from unfair competition, while securing for practising architects the advantages of knowing that they were only engaging qualified men, and at the same time uniting both parties in an endeavour to further the interests of the profession generally.

Mr. E. J. Dixon, A.R.I.B.A., London, founder of the Guild, delivered an address in favour of establishing a branch of the Guild for South Wales and Monmouthshire. He pointed out the practical advantages of unity, saying that the days when the principal took a real interest in his pupils were past. He referred also to the architectural assistants turned out by the schools, colleges, and even the universities, without any attempt to regulate the supply.

The assistants must combine for their own support, and so be able to insure themselves against the many and various difficulties that arose in the course of their business. The benefit gained by mutual help would be of immense advantage to the rank and file of the profession. For the great majority of the assistants, architecture was first and foremost their means of gaining a livelihood, and some steps ought to be taken to render that livelihoood less precarious than was at present the case.

The Guild could act in a variety of ways for the benefit of its members. A principal had his remedy against an incapable or fractious assistant, but the assistant had no remedy in those cases where he was at the mercy of an unscrupulous employer. The Guild would have to undertake cases of this kind, first by friendly remonstrance addressed to the principal, and then by such other means as the nature of the case might suggest.

Then an employment bureau would be formed, and an allowance made to those out of a berth. Endeavours would be made to organise a system of registration on a large scale, so that the central body or local branches would be able to place many in situations who at present were unable to get in touch with the work for which they were fitted.

Statistics would have to be obtained in all centres as to the number of assistants, and the percentage of unemployment, before any definite unemployment scheme was adopted; but the tentative proposal was to pay a

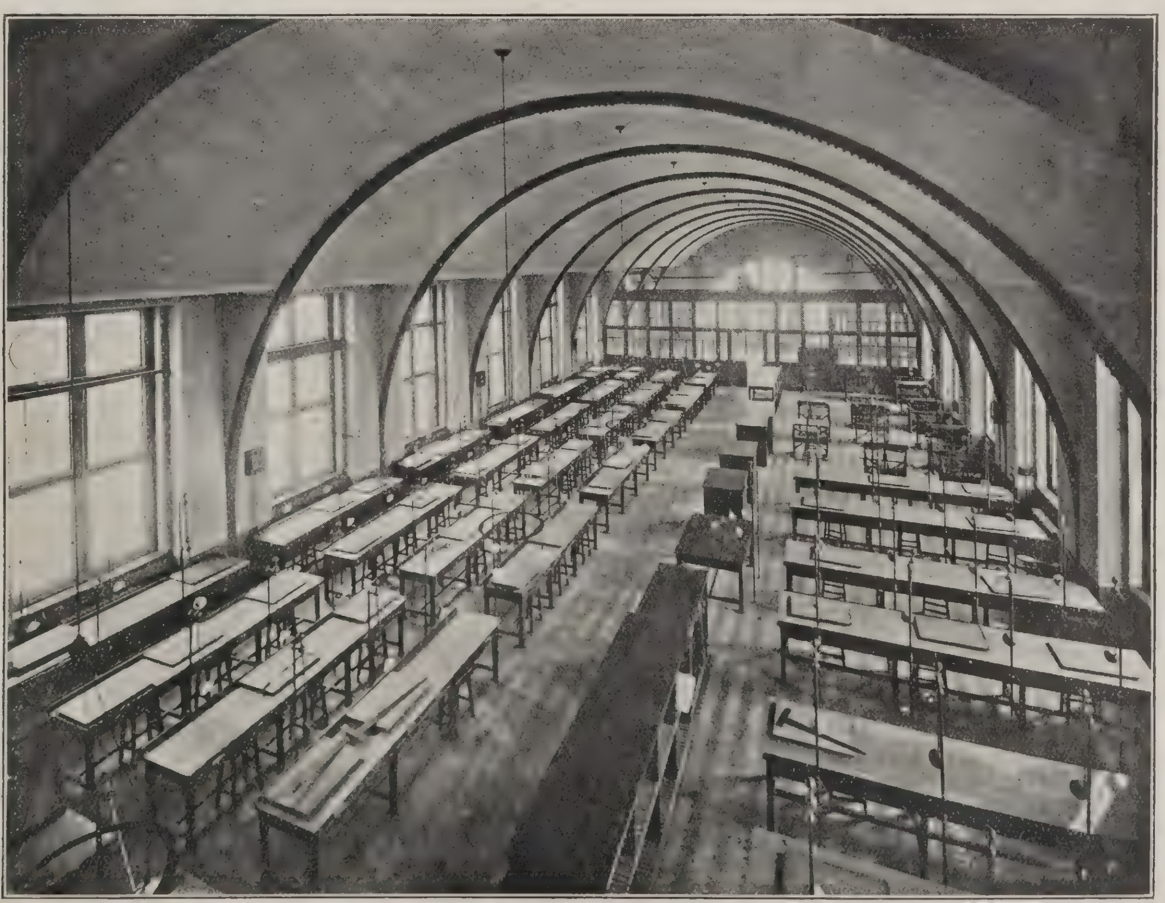


Photo: Topical.

BIRMINGHAM UNIVERSITY: DRAWING OFFICE IN MECHANICAL DEPARTMENT. SIR ASTON WEBB, C.B., R.A., F.R.I.B.A., AND E. INGRESS BELL, F.R.I.B.A., ARCHITECTS.

In the Mechanical Department architectural effect has been wisely subordinated to utility; and the Drawing Office here shown has the obvious merit of being exceedingly well-lighted.

thirtieth of the salary to the funds, and receive a half of the salary when unemployed.

There was also the question of the graduation of salaries, which undoubtedly bristled with difficulties, yet he believed it was far from being impossible of solution. Much more could be done by the grading of assistants into their respective spheres as designers, draughtsmen, constructionists, etc., and he had no doubt that with the co-operation of employers much could be accomplished to remedy a state of affairs under which some of the best men in the country were working for salaries no larger than the wage of an artisan.

He also referred to a scheme of education, pointing out the anomalies of the present examination system. Finally, he invited all to do their best to bring the Guild into active operation, and to see that it did not fail for lack of energy. There was no body at present dealing exclusively with the interests of assistants, who were fast becoming a most important section of the profession; and it was for the Guild to fill up this gap, and unite for protection and advancement.

An animated discussion then took place, in which several points of interest relating to the constitution of the branch and the scope of its work were satisfactorily answered by Mr. Dixon, and the following resolution was thereupon adopted:—"That this representative meeting of architects' assistants, supported by several well-known local architects, recognising the urgent need of combination and union in order to further their professional interests, resolves that a branch of the Guild of Architects' Assistants for South Wales and Monmouthshire should be formed in Cardiff, and that a committee be forthwith appointed for that purpose."

The Provisional Committee was then reelected, with power to co-opt others, Mr. S. Bowen Williams, of 110, Miskin Street, Cardiff, being appointed hon. secretary.

BRIGHTER PROSPECTS FOR THE BRICK AND TILE TRADES.

The season of early summer used to be one of the busiest for the brickmasters, and from June on to the end of October the demand increased. The building trades were generally in full swing, as well as many large contracting enterprises, and railway extensions and widenings swelled the demand. Notably was this the case while the Great Central Railway was being constructed. All other railways were also large users of blue and brindled bricks, rival railways were then keenly competing for ascendancy, and numerous branch lines were made in order to reduce distances and accelerate transit.

Now, however, the rivalry seems to have subsided. The boom in branch lines has ceased. Attention, however, is being devoted to the widening of existing lines, and this, of course, implies the occasional enlargement of stations, and the making of wider viaducts, bridges, and tunnels. Railway engineers have a profound faith in blue and brindled bricks, but in specifying them they leave the contractors a free hand to buy in the best markets. North and South Staffordshire are the largest producers of this class of clay goods; and although the brickyards in those districts are not as brisk as formerly, they are enjoying the lion's share of steady and continuous demand. Profits, however, are lower than formerly. It used to be the custom of nearly all firms to issue periodical printed price-lists, but for some time now that practice has been abandoned, and it is the rule to quote only on application, and according to the quantities needed for specific contracts. It is now the rule to quote nett prices, both at the works, and inclusive of delivery by road, rail, or water, and the abolition of discounts has made the terms much more satisfactory to the builders and contractors. The system saves much trouble to all parties, and renders the quotations, accounts, and book-keeping more clear and simple. Railway companies never allow discounts, and universal abolition would certainly simplify business. The railways issue their accounts at the end of the month, and require payment before or by the end of the month after, and the brickmasters, having adopted this practice, have not experienced much difficulty in carrying out the new system.

The demand for best-pressed blues and reds for facings has somewhat declined, terra-cotta having come more into use, especially for such buildings as free libraries, science and art institutions, and technical and other schools; but common reds, browns, and brindles, are in full demand. There are some big undertakings projected that will inevitably, if carried out, create greater prosperity for the makers of blue and brindled bricks. Sir John Jackson, in giving evidence in London before the Royal Commission on canals and waterways, on the question of a canal for sea-going vessels and battleships between the Clyde and the Forth, via Loch Lomond, estimated the cost at £20,000,000. The canal would probably be used by German vessels from Hamburg to New York, owing to the saving of time that it would enable them to effect. The Scotch manufacturing districts, however, would benefit largely from this great waterway. The contract for the construction of a huge dock at Rosyth has already been let to the firm of Easton, Gibbs, and Son, of Westminster, and they will very soon be placing their orders for materials, including Staffordshire bricks. Some millions of blues and brindles will be used. Messrs. H. Lovatt, Ltd., builders, Wolverhampton, have secured a large contract from the Great Western Railway for the further extension of that company's station at Snow Hill, Birmingham. Another waterway scheme that is mooted will, if carried out, infuse new life into the South Staffordshire and Midland trades. Sir John Wolfe Barry is conducting, on behalf of the Royal Commission on Canals and Waterways, an inquiry into a proposal to deepen the waterway from Gloucester to Worcester, and the canal from Worcester to Birmingham, to a sufficient extent to take barges carrying 100 tons and upwards. This will admit of manufactured goods from the Midlands being brought down to Cardiff for shipment, and enable timber, grain, and other importations into Cardiff to be transported to the Midlands. The scheme, if carried out, will cost £2,000,000. The new Naval docks to be constructed along the east coast will require millions upon millions of blue and brindled bricks, and will give a much desired impetus to the brick trades.

Our railways have for a long time shown great consideration to the brick and tile industries, having for many years ceased to exact their maximum tolls for bricks; and some of the permanent rates are exceedingly low. From South Staffordshire and East Worcestershire, for instance, to London, the rate for 5-ton loads is only 6s. 3d. per ton, and the railway companies have generously met the makers for all large lots required for specially large contracts. They also show more liberality in dealing with claims for brittle goods broken in transit, while the charges for detention of trucks (demurrage) have been reduced to one-half.

A DECADE OF FIRE PREVENTION.

The British Fire Prevention Committee, which was founded on the occasion of the great Cripplegate fire of 1897, and which was incorporated in 1899, celebrated the tenth anniversary of its incorporation on May 24th and 25th, when a number of distinguished visitors, including several from abroad, attended its meetings.

The committee's primary object during the last ten years has been to deal with the protection of life and property from fire by the adoption of preventive measures, and, during that period it has favourably influenced the reduction of the possibilities of fire, and of the spread of fire.

The greater knowledge of building materials and appliances obtained by scientific independent tests at the committee's testing station has done much to obtain a better understanding of the value and also the limitations of different methods of construction and equipment, whilst considerable influence has also been exerted by the committee in guiding building and fire service legislation in directions where it is most effective to prevent loss of life and loss of property.

Probably the most notable event in the committee's career was the large International Fire Prevention Congress of 1903, and the arrangement of the technical exhibits at the Fire Exhibition that was held on that occasion at Earl's Court. No fewer than 800 delegates attended the Congress, including more than 200 from abroad.

Other notable events were the arrangement of special commissions, comprising members of the committee who are instructed to visit various foreign countries and report on the subject of fire preventive legislation, and fire preventive arrangements generally, on the Continent. In this manner Austria, Hungary, Italy, Switzerland, and South Germany have been visited, and North Germany is being visited this year. Illustrated reports were issued dealing with these journeys, and were at the disposal, not only of members of the committee, but of the various public authorities concerned.

Another special commission that was appointed was that to deal with concrete aggregates. This commission has already published an interim report, but its final report will be dependent on the extent of the tests that can be undertaken with concrete aggregates according to the amount of funds available for this enquiry.

The reports issued by the committee to its members number 140, and comprise a comprehensive survey of the subject of fire prevention.

Of the founders who have held office on the Executive from the time of its incorporation to the present time should be mentioned Mr. Edwin O. Sachs, F.R.S.Ed. (chairman); Mr. Ellis Marsland (hon. secretary), and Mr. Max Clarke, F.R.I.B.A.

The objects tested by the committee since its formation numbered 160 to the end of last year, and it should be understood that the investigations into any one object sometimes requires as many as 20 or 30 testing operations. Notable tests have been those with large reinforced concrete floors, a series of fifty fire-resisting doors, fire-resisting glazing, and latterly also with safety devices.

Probably the tests that have had as great an influence as any on the development of the building industry were those with concrete and reinforced concrete floors, of which twenty have been under test, and several have been under test more than once. There were also tests with floor slabs of identical dimensions, but of different aggregates. Tests that have also materially influenced the development of fire preventive measures are those with fire-resisting glass. The wire glazing was under test on seven different occasions, and the electro glazing on five occasions.

The whole of the funds required for the establishment of the committee's testing station, and the execution of its work, have been raised voluntarily. More than £20,000 has been expended in ten years on the work of the committee, and the whole of the services of the committee and their officers are rendered voluntarily, members as a matter of fact even bearing all their own out-of-pocket expenses.

It is customary to decry the research work done in the United Kingdom as compared with the research work done elsewhere with the aid of Government grants and subsidies, but the British Fire Prevention Committee's testing station has so far not been rivalled in any other country, although imitated in the United States, France, and Germany, with the aid of Government funds.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himsel of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

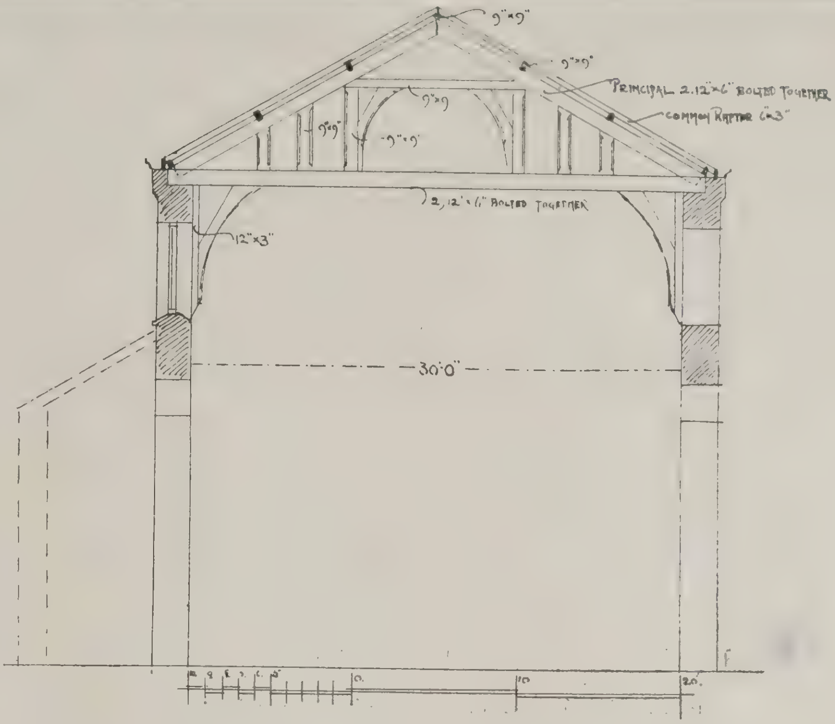
This fee of 1s. required fo answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable and it must be understood that both question a reply will, as a rule, be published in these columns.

Truss for Church Rcof.

GLASGOW.—"J. W. S." writes:—"What is your opinion of the church roof shown on the accompanying sketch drawing, and what is the easiest way to get sizes of the various timbers in same? Also, could you name a good book or books on estate management?"

The truss submitted would be a novel form, but not a particularly desirable one, as it would take rather more timber than usual, and would want great care in jointing and bolting. A single 12in. by 6in. timber would be ample for the tie-beam and also for the principal rafters; the truss being made 6in. thick, all the members may be flush on the two faces. The purlins need not be more than 9in. by 6in. For books on estate management, see Burn's Outlines of Estate Management (Lockwood, 2s. 6d.), Henderson's Young Estate Manager's Guide (Batsford, 4s.), Stephenson's Repairs: How to Measure and Value them (Batsford, 3s.), Greenwell and Curry's Rural Water Supply (Batsford, 4s.), Everyday Uses of Portland Cement (Associated P.C. Manufacturers, Portland House, Lloyd's Avenue, London, E.C., 2s. 6d. HENRY ADAMS.



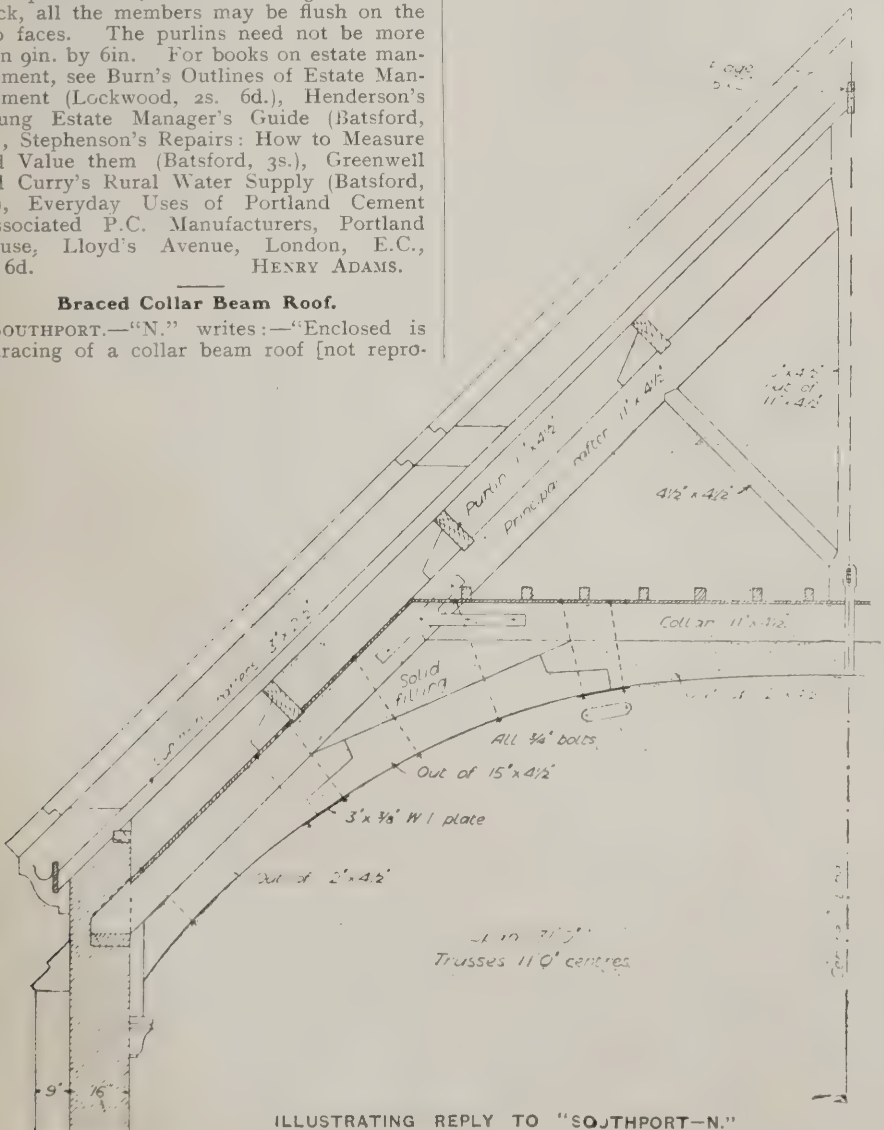
ILLUSTRATING REPLY TO "GLASGOW—J.W.S."

Braced Collar Beam Roof.

SOUTHPORT.—"N." writes:—"Enclosed is a tracing of a collar beam roof [not reproduced]. Will you please let me know whether you consider it is of safe construction?"

The accompanying illustration shows the truss proposed, with the suitable scantlings, joints, and bolts

HENRY ADAMS.



ILLUSTRATING REPLY TO "SOJTHPORT—N."

Load on Channel Section.

LONDON, S.W.—W. H. L. writes:—"How would you calculate the safe distributed load that could be put upon a 15in. × 4in. × 41.94lbs. R.S. channel, with a span between supports of 20ft.? What would be the numerical value of the moment of inertia for this section? The load comes on the flanges."

The moment of inertia of a 15in. × 4in. × 41.94lb. about an axis parallel to the flanges is 377.0in. units.

$$\therefore \text{section modulus} = \frac{3\cdot77}{7\cdot5} = 50\cdot27 \text{ inch units.}$$

Then adopting a working stress of 7 tons per sq. in.,

$$\text{Safe B.M.} = \frac{50\cdot27}{7} = 7\cdot18 \text{ inch-tons.}$$

$$\therefore \frac{WL}{8} = 7\cdot18.$$

$$\frac{W \times 20 \times 12}{8} = 7\cdot18.$$

$$W = \frac{7\cdot18 \times 8}{20 \times 12} = 2\cdot4 \text{ tons nearly,}$$

i.e. nearly 5 cwt.

A.

Steel and Concrete Floor.

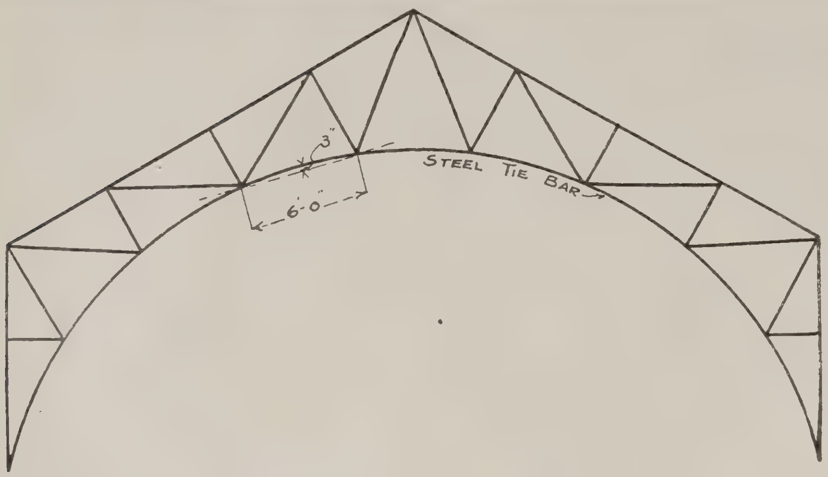
LONDON, W.C.—G. G. L. T. writes:—"In the construction of a steel and concrete floor, a 6in. by 3in. rolled steel joist is to be connected to the main joist (18in. by 7in.) in the position shown in the accompanying sketch [not reproduced]. The small joists only resting on the angles, there would appear to be the danger of their becoming dislodged, especially when the concrete is being rammed in."

In the writer's opinion, the small joists should be fixed in position before the concrete is rammed in. Angle cleats formed of the 3in. × 3in. angle would be satisfactory, or the joists might be just bolted down to the angles. In the latter case, care should be taken to see that the two ⅝in. rivets would be enough to carry the shear. This depends on the spans and loads, but in most cases they would be enough. A.

Stresses in Curved Tie-bar.

SCOTLAND.—FIFER writes:—"(1) Please explain the correct method of calculating the sectional area of the curved tie-rod shown in the accompanying sketch: assuming that the stress in the bar is 20 tons, and the deflection from a straight line joining the ends of bar is 3 inches. (2) Does the same method apply to the curved rafter in a segmental roof, where the stress is of compressive nature instead of tensile?"

(1) The stresses in a curved tie-bar carrying a load W and with a deflection X are given



ILLUSTRATING REPLY TO "SCOTLAND—FIFER."

by the formulæ ·

$$\text{Max. stress}=\frac{W}{A}\left(1+\frac{xd_t}{k^2}\right)\ldots\ldots\ldots(1)$$

$$\text{Min. stress}=\frac{W}{A}\left(1-\frac{xd_c}{k^2}\right)\ldots\ldots\ldots(2)$$

where

A = cross-sectional area of bar,
d_t = distance from centroid to edge of section nearest to chord,
d_c = distance from centroid to edge of section farthest from chord,
k = radius of gyration of section about centroid.

In the present case, assuming that 7 tons per sq. in. is the safe stress,

$$7=\frac{20}{A}\left(1+\frac{3d_t}{k^2}\right)$$

From this the area cannot be obtained directly, but the necessary section must be obtained by trial; e.g., take 2 6×4×½ unequal angles placed with their long legs upwards.

From tables we see that $A = 2 \times 4.75 = 9.50$; $d_t=1.96$. $k^2=\frac{I}{A}=17.1=3.6$.

$$\therefore\frac{20}{A}\left(1+\frac{3d_t}{k^2}\right)=\frac{20}{9.5}\left(1+\frac{3\times 1.96}{3.6}\right),$$

$$=\frac{20}{9.5}\times 2.63=5.53 \text{ tons per sq. in.}$$

This section is therefore stronger than necessary.

Taking 2.5½×3½×½ angles, $A=8.5$, $d_t=1.85$, $k^2=\frac{12.8}{9.25}=3.01$.

$$\therefore\frac{20}{A}\left(1+\frac{3d_t}{k^2}\right)=\frac{20}{A}\left(1+\frac{3\times 1.85}{3.01}\right)=6.7 \text{ tons per}$$

sq. in. nearly.

This will be satisfactory.

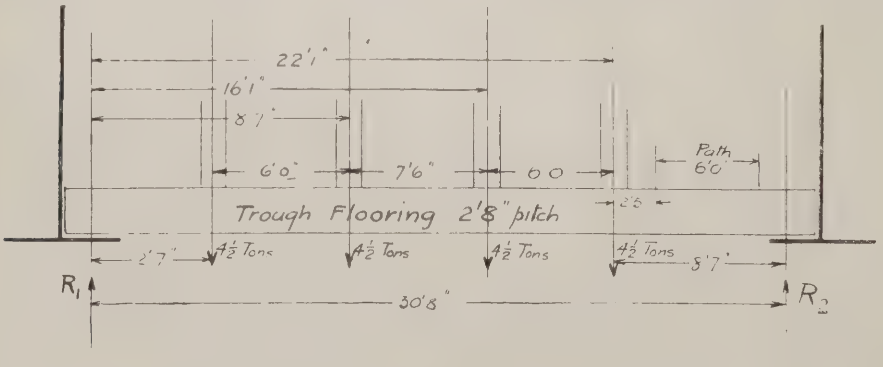
(2) The above method is applicable to the case where the force is compressive, with the exception that instead of a safe stress of 7 tons per sq. in., we must use the safe stress per sq. in. for the section considered as a strut. A.

Trough Flooring Design.

PROVINCES. — WINDSOR writes: — "Please clear up the following points in connection with the design of steel trough flooring: The section of troughing adopted in a given case is sufficiently strong to carry the dead weight of road material, and a crowd of people, on the whole area of the bridge. It is also strong enough to carry a 14-ton traction engine and train of loaded trucks with remaining area of bridge carrying a crowd of people; but in considering a case where two 14-ton traction engines will pass over the bridge, in opposite directions at the same time, it will appear theoretically (as will be seen by the enclosed calculations) that the troughing is much too weak, although the bridge in question has been subjected to such a test upon more than one occasion, and with apparently not the slightest injury to the troughing. I shall therefore be glad to have your views upon the calculations. I am not clear as to which method in cases 1 and 2 is the more correct theoretically, and whether it is wise in practice to allow such a margin as that shown beyond the safe working stress of 6½ tons per sq. inch.

"In case No. 1 the loads transmitted by the traction engines are treated as live loads, and the maximum BM in inch tons × 2 to bring the result to equivalent dead loads. In case No. 2, the loads transmitted by the traction engines are treated as loads which are equivalent in effect to those between dead loads and live loads suddenly applied, as in the case of railway engines, and multiplied by, say, 1½ to bring to equivalent dead loads."

The querist's calculations are not reproduced in detail, but one of his diagrams is here given. This query raises points upon which there is considerable difference of opinion among designers. With a working stress as low as 6½ tons per sq. in., some designers would not make any extra allowance for the fact that the load is "live," but this is not, in the writer's opinion, really satisfactory. In the present case it does not appear to be necessary to limit the number of troughs to 1½; a trough floor may be looked upon as a single beam, and, the loads given, two and a-half or even three troughs might be considered as carrying the load. The writer would therefore recommend dealing as in case 1, *i.e.*, taking equivalent dead load = 2 × live load, and taking 2½ troughs as carrying the load. Then with the above-given values of the bending-moment, the stress would come $=\frac{2202.35}{135.2\times 25}=6.2$ tons per sq. in., nearly. The actual length over which to spread the load is, of course, dependent upon the dimensions of the traction engine, but about 6ft. can be taken as satisfactory in most cases. A.



ILLUSTRATING REPLY TO "PROVINCES—WINDSOR."

Tie-rods to Hall Roof.

ELGIN.—SURVEYOR writes:—"Would the tie-rods shown in the accompanying sketch of a hall roof be of much service? If these are added, would it still be necessary to strengthen the buttresses?"

FIG. 1

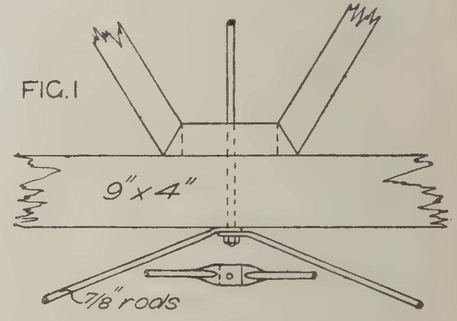
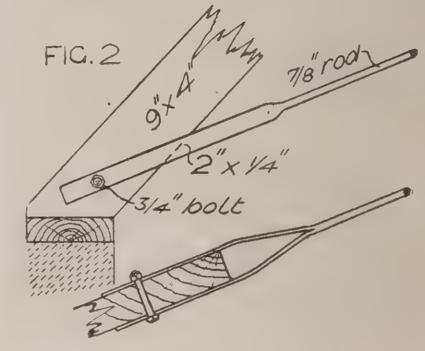


FIG. 2



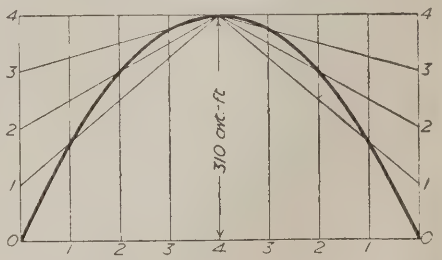
Tie-rods to a large collar beam roof are of great assistance in preventing thrust upon the walls. If they are put into this roof the additions to buttresses will not be needed. The tie-rods can be fixed as shown in Fig. 1 for centre and Fig. 2 for ends.

HENRY ADAMS.

Stress Diagram for Open Timber Roof Truss.

DUBLIN.—R. C., JUN., writes: "With reference to the reply to 'H.,' in your issue of May 12th, will Mr. Adams kindly explain how he obtained parabolæ as diagram of bending moment as shown in Fig. 4?"

Taking the right-hand lower curved brace, the direct tension is 388 cwt., and the versin between the straight line and curve is 0.8ft., giving the maximum bending moment in centre as 388×0.8=310cwt.—ft. The intermediate bending moments between the centre and ends vary as ordinates to a parabola, which is set off as follows. Upon the base given by the straight line joining the ends of brace, set off a central height equal to the maximum bending moment to any given scale, draw a complete rectangle, divide the base into say eight equal parts, and each side into half the number of equal parts, join up as shown, and the parabola will be drawn through the intersections.



HENRY ADAMS.

LONDON FIRE BRIGADE'S NEW CHIEF.

To the general surprise, the question of the command of the London Fire Brigade became the subject of controversy, whereas the public had expected that the appointment would be the simple matter of promoting the second officer, Mr. Gamble, F.S.I. As a leading authority on fire protective matters, and as an officer of seventeen years' standing in the London Fire Brigade, Mr. Gamble had richly merited the advancement; but the County Council, rejecting this simple solution, thought fit to advertise for candidates; and the Fire Brigade Committee, whilst recommending Mr. Gamble to the office, also put forward certain other names.

Photo: Topical Press.

LIEUT. SAMPSON SLADEN, R.N.
The New Chief Officer of the London Fire Brigade.

He joined the Fire Brigade on January 31, 1899, but is still on the active list of the Royal Navy. For assisting to save lives from the Italian steamship *Utopia*, Lieut. Sladen was awarded a medal and diploma by the Italian Government. On his first joining the Brigade he was appointed to the position of Third Officer, but in October, 1904, the title was altered to that of "Divisional Officer," and Lieut. Sladen was placed in direct charge for fire brigade purposes of the whole of the County of London north of the Thames, with the exception of that part included in the central district.

Thereupon it would appear that the General Purposes Committee of the London County Council, in their wisdom, deemed that the command should be vested in a naval officer, as if the whole of the management of the brigade and the whole of the fire protection of London were merely a question of naval discipline! They recommended a naval officer, Commander Cowper. So strongly was this General Purposes Committee bent on securing military or naval discipline, that they put forward as alternative candidates not the second officer, but the third officer, Lieutenant Sladen, formerly of the Royal Navy; and a Royal Engineer officer, Major Crookshank.

Needless to say, the general public of the metropolis interested in the subject—and, as a matter of fact, the Council as a whole—were dissatisfied with the action of the General Purposes Committee, and when their recommendation came forward it resolved itself into a question of voting as to whether the whole matter should be "referred back" or not. The result of the voting against this "reference back" was a small majority, obtained on a plain show of hands. That the matter was not referred back as it should have been as one would have expected, was due, we are afraid, to the entirely injudicious and untimely action of certain superintendents and firemen of the London Fire Brigade, who, thinking that they would do Mr. Gamble a "good turn," actually petitioned the Council for his appointment. Nothing could have been less in the interests of Mr. Gamble or in the interests of the brigade than this unwise action on the men's part, for every member in the Council who has had anything to do with military or naval matters naturally disliked the idea of a petition of this kind. To put it quite plainly, it was this unfortunate petition (of which Mr. Gamble and the other superior officers of the brigade had not the slightest cognisance), which ruined his claims.

Mr. Gamble having been thus unfortunately put out of court, it only remained for the Council to decide which of the three candidates put forward by the committee should be selected; and we think the Council acted rightly in selecting Lieutenant Sladen, who has had some ten years' experience of Fire Brigade work, and so had far greater claims than any stranger. We believe that the large majority by which this officer was finally selected was due in great part to the whole of the votes for Mr. Gamble having been transferred to Lieutenant Sladen; and we think this was also done rightly, for it would have been a set-back to the whole of the fire service of the country if a stranger had been allowed to step in at this stage. It would have meant cutting off the career of the junior officers of the brigade, and it would have been a kind of advertisement that scientific knowledge or experience were not wanted in fire brigade work.

Whilst sympathising most sincerely with Mr. Gamble, on the other hand, we are glad that, failing him, the succession should have fallen to Lieutenant Sladen.

During the time Lieutenant Sladen has held the position of Third Officer, he has taken the greatest possible interest in the technical aspects of fire protection. Building questions have been a particular study of his, and he has been actively interested in the scientific study of fire protection. It is to be hoped that his command will be thoroughly successful, and that the excellent relations that exist between the London Fire Brigade and the various fire service and fire preventive associations at the present time, may be maintained. Mr. Sladen enters his new duties and responsibilities with the good wishes of those who have the fire protection of the Metropolis at heart.

L.C.C. FIRE BRIGADE COMMITTEE.

The Fire Brigade Committee of the London County Council report that working drawings of the proposed new fire-station in Parnell Road, Bow, have been prepared, and that quantities should be taken out and lithographed at an estimated cost of £235. The Council had approved an estimate of expenditure on capital account of £2,400 in respect of the purchase of a site and the preliminary expenses in connection with the preparation of plans; but as the site cost £2,200, exclusive of costs, the balance of the estimate was not sufficient to cover the cost of the quantities. A supplemental estimate of £300 to cover the cost of the quantities and other preliminaries was therefore submitted to the Council. The committee think it undesirable that an estimate of the whole cost of erection of the station should be submitted at this stage. The committee also report that the external woodwork and ironwork at sixteen fire stations and eight street fire-stations, and the front appliance room doors at twenty-three fire-stations require to be painted this year, and that the expenditure, which is estimated not to exceed £1,189 11s. 3d., is provided for in the estimates for the current financial year. The work is to be executed by Messrs. Gladding and Co., under the jobbing schedule. A further recommendation is that expenditure not exceeding £111 be sanctioned for the purchase of 120 chemical fire extincteurs for the fire brigade; it being a rule that a chemical fire extincteur should be kept at each fire-station, and that two extincteurs should be carried on each motor fire-appliance. They cost £1 each, less 7½ per cent. discount.

ANNUAL CONGRESS OF FRENCH ARCHITECTS.

The thirty-seventh annual congress of French architects, which was held at Toulouse from June 20th to June 26th, appears to have been, at least from the social point of view, entirely successful. The meetings were held at the Hôtel d'Assézat, which is a building of considerable architectural interest. It was built about the middle of the sixteenth century, but has, of course, undergone many restorations. It is the favourite hotel of the learned societies of Toulouse.

The sittings opened under the presidency of M. Yvon, of Paris. The members of the Congress were welcomed by M. Feuga, representing the Mayor of Toulouse. The first matter under discussion was an elaborate report, prepared by MM. Bonpaix and Delaire, on the incidence of taxation with respect to the liberal professions, and its effect on architects. The chief grievances seem to be that architects are required to furnish the authorities, during January, with a full and particular account of their incomes during the year immediately preceding, the architects naturally requiring more time for the ascertainment of their earnings; and that the official inquiry into the architect's circumstances is inquisitorial and humiliating. The whole subject, however, assumed so much complexity that the meeting felt unable to deal with it, and expressed the view that the Central Society of Architects should make representations to the Fiscal Commission of the Senate.

The next question debated was that of the insurance of architects against professional risks. The nature of these risks may be inferred from the fact that several speakers held that, under a proposed system of mutual insurance, "honest and conscientious architects would be paying premiums for the sole benefit of those who were less scrupulous, who covered by the insurance, would not hesitate to produce careless work (*n'hésiteront pas à livrer un travail négligé*)." The Congress unanimously approved of the principle of assurance against personal risks, but rejected the idea of mutual assurance.

M. Frantz Blondel, President of the Provincial Association of French Architects, took the chair at the session of June 22nd, when M. Masquet introduced the subject of the organisation of apprenticeship in the building industry. He advocated a system in which the workshop training afforded by the employer should be supplemented by some special organisation which should superintend and systematise the instruction of apprentices. A desultory discussion, in which a good many more or less visionary and manifestly impracticable ideas were expressed—as, for instance, that parents being deterred from apprenticing their boys to an industry that made no provision for the aged workmen, the obvious remedy was to include in the apprentice's education a course of instruction in social economy, so that he might see clearly the necessity for thrift and foresight! Naturally, it was at this point that the sitting was adjourned for the day. At the resumption, M. Blondel deprecated any further appeal to the State. "We have," said M. Blondel in effect, "enough laws and by-laws. The real remedy does not lie in that direction." After an animated debate, the following resolutions were adopted: (1) That the architectural societies take the initiative in promoting the formation of societies for the development of apprenticeship in the building trades. (2) That the societies thus formed shall put themselves in communication with the chambers of commerce, general and municipal councils, employers' and operatives' organisations, and all other groups and individuals concerned, in order to obtain their moral and financial support, with the object of (a) organising the pre-apprenticeship conditions, either at school or otherwise; (b) subventioning the smaller employers to encourage them to take apprentices; (c) stimulating the apprentices by means of competitions with prizes and rewards; (d) assisting the young workmen to perfect themselves in craftsmanship by establishing courses of technical instruction. (3) That the syllabus in primary and higher elementary schools should be so modified as to give the chief attention to classes of manual instruction, design, modelling, woodworking, ironworking, and similar occupations. (4) That the law of 1892 with respect to the working-time of apprentices, and that of 1902 concerning hygiene, should be modified, with due regard to the proper limitation of hours for those of tender years. These views are almost identical with those enumerated at the recent Paris Congress, the chief difference being that those were of general application, whereas at Toulouse only the building trade was taken into consideration. The fact that architects should think it worth their while to take such an active interest in a question which the profession in this country would consider to be a purely family affair for the employers is rather a striking proof of the diverse footing on which the architects of the respective countries stand.

There was, of course, the usual round of visits to places of interest; and the inevitable banquets were held, respectively, at the Grand Hotel and in the Palais d'Orsay.

Works in Progress and Completed.

ABERAMAN.--The new Public Hall has been opened. It comprises a large hall to seat 1,400 people, a lesser hall to seat 400, eight committee-rooms for workmen and others, reading-room, lending library, ladies' reading-room, slipper and shower baths, swimming bath, billiard-rooms, and game rooms. It is lit by electricity. Mr. T. Roderick was the architect, and Messrs. J. Morgan and Son, Ltd., of Aberdare, the contractors. The cost was above £10,000.

ASHFORD (Middlesex).—A new residence is being built here in Reedsfield Road by Mr. S. Dinn, of 17, Cathnor Road, Shepherd's Bush.

ASHLEY DOWN.—A large mixed school, known as the Sefton Park School, is being erected from the designs of Messrs. W. V. Gough, F.R.I.B.A., and A. R. Gough, A.R.I.B.A., of Bridge Street, Bristol, and the general contractors are Messrs. G. Humphreys and Son.

BATH.—The additions to the Bath Royal United Hospital have been completed. The site was obtained by the demolition of four small shops, and the space obtained was awkward and cramped. The additions comprise an extension of the nurses' home; accommodation for the out-patients; and the provision of an isolation ward. The building, of four floors, is faced with Bath stone, and has a flat roof. Mr. E. Keene Oliver, of Bath, is the architect, and Mr. F. J. Blackmore, of Tiverton, W. Bath, the contractor. The cost is about £4,000.

BEN RHYDDING.—A new Wesleyan Church, to seat about 250, has been erected here at a cost of about £3,500.

BIRKDALE.—Messrs. Austin and Paley, Lancaster, are the architects for the extensions at St. John's Church, the original church being erected from their designs in 1889. The additions comprise a new north aisle practically the same as the present south aisle, the present temporary north wall of nave and chancel being removed, and an arcade of five arches substituted; a new entrance at the western end of aisle; a clergy vestry at the east end, and a choir vestry, 25ft. by 17ft., on north side, with separate porches and lavatories. The chancel screen will be continued under the new north arch. It is proposed to remove the organ to position of the present temporary vestry in south aisle, so as to allow of additional sittings. The total additional accommodation obtained is 186 sittings. The contractors for the work are Messrs. Duxfield Bros., of Southport.

BRIDGEND.—A new mission Church, to seat 250, has been erected here. Mr. A. Jenkins, of Blackmill, was the architect, and Mr. Philip Gayland, of Bridgend, the contractor.

CARDIFF.—The foundation stone of St. Luke's Church, Victoria Park, Cardiff, has been laid. The building, which has been designed by Mr. G. E. Halliday, F.R.I.B.A., is to seat 700 people, and the estimated cost is £3,500.

CASTLEFORD. — The new Secondary School in Cemetery Road, designed by Mr. W. S. Braithwaite, of Leeds, and costing over £12,000, was opened last month. The school comprises assembly hall, twelve class-rooms, manual instruction room, domestic science room, committee-room, headmaster's and assistants' rooms, bicycle rooms, gymnasium and dining-room, chemical and botanical laboratory, lecture theatre, optical room, physics and geographical laboratory, elementary and advanced art rooms. The grounds are laid out for tennis court, hockey, cricket ground, and school gardens.

DARLASTON.—A new Central Primitive Methodist Chapel in Slate Street is now being erected. The new building will hold about 700 people, and cost about £3,300. Mr. C. W. D. Joynson, of Wednesbury, is the architect.

DINGWALL.—The new U.F. Church has been erected at a cost of £3,500. The architect was Mr. William Mackenzie, Dingwall; and the contractors were: Mason work, Messrs. Tuach and Son; carpenter, Mr. Wm. Macdonald; plasterer, Messrs. Mackay and Son; plumber, heating, and electric light, Mr. Donald Mackenzie; slater, Mr. Rod. Fraser; painter, Mr. James Mackenzie.

EALING.—The foundation stone of a new church-house, club rooms and chapel for St. Saviour's Church, has been laid. The building is in late Gothic style, and will cost about £4,000.

EBBW VALE.—The new church of St. John, Newtown, erected from the designs of Mr. G. E. Halliday, F.R.I.B.A., has been opened. The structure, which was built by the Ebbw Valley Building Company, seats 500 people, and has cost about £3,000.

EDINBURGH.—The Charlotte Chapel in West Rose Street is to be rebuilt on the present site at a cost of between £6,000 and £7,000. The new building is to provide accommodation for 1,000 persons in the main hall, 500 in the lower hall, and 250 in an upper hall. Mr. J. A. Arnott and Mr. J. Inch Morrison, of 21, York Place, are the joint architects.

FAILSWORTH.—The foundation stones of the Macedonia Congregational Church have been laid. The building will seat 500 people, and is designed in a modern treatment of Gothic, with facings of red-pressed brick, with dressings of grey terra-cotta. The total cost, inclusive of land and furniture, will be about £2,400. Messrs. Ernest Ogden and Percy C. Hoy, A.R.I.B.A., are the architects.

FAIRHAVEN, LYTHAM.—A new Wesleyan Church is being erected here at a cost of £5,250, to the designs of Mr. A. Brocklehurst, Adelphi Chambers, Brown Street, Manchester. The design is in the late decorated Gothic, the main features being the five-light traceried windows over the front double entrance doors, and massive but graceful towers. Externally, the building is being faced with Rossendale wallstone with Stancliffe white dressings, and the roof covered with Westmoreland green slates. The general contractors are Messrs. Smith Bros., Ltd., Burnley and Blackpool.

GLASGOW.—The merchants' house building has been re-opened after extensions and internal reconstruction, from the designs of Mr. J. J. Burnet, A.R.S.A., F.R.I.B.A.

GLOUCESTER.—A L.G. Board enquiry has been held relative to a proposed loan of £15,000 to the County Council for extending the Shire Hall. Plans have been prepared by Mr. R. Phillips, Assoc.M.Inst.C.E., Consulting Surveyor to the Council. Tenders have been invited for the new building, the lowest amounting to £13,857 16s. 6d.

GOUROCK.—A new school in Binnie Street for 700 scholars has been opened. Sewing and art rooms and a science laboratory are included in the accommodation, there being 12 classrooms and a large hall. Mr. Alex. Cullen, of Hamilton, was the architect, and the cost amounted to £9,295.

HANLEY.—The Town Council has accepted the tender of Mr. Godwin at £4,793 for the erection of the new Council Chamber over the Quarter Sessions Court. The plans have been prepared by the Borough Surveyor and Mr. A. Scrivener.

HARROGATE.—The new Church of St. Andrew, Starbeck, is to be commenced immediately. The cost is estimated at £6,100.

HASLINGDEN. — The new infirmary buildings are in course of erection. Provision is made for 158 beds, a maternity ward, and a nurses' home. Mr. Henry Ross is the architect. Wm. Brown and Sons, of Salford, are the masons employed, and the other contracts have been placed as follows:—Moore, Rawtenstall, joiner; Riley, Accrington, plumber; Cooper, Manchester, steelwork; Whitehead and Binns, Rawtenstall, plasterer; Holt, Haslingden, slater; Houlgrave, Accrington, painter. The heating will be done by the Brightside Engineering Co., Sheffield; the ventilating by Hargreaves, of Bury, and the warm air ventilating stoves by E. H. Shorland and Bro., of Manchester.

HEANOR.—A Baptist Sunday School is being erected here at a cost of £1,186.

HEYWOOD.—The tower of All Souls Church, which is being erected by the Vicar, the Rev. Rathbone Hartley, to the memory of his late wife, will stand about 80ft. high, and is faced with dressed stone and Yorkshire parpoints in keeping with the rest of the church.

HINDLEY. — A new Congregational Church (St. Paul's), will be commenced shortly, on the site of a former church, dating from 1815. Mr. Herbert Wade, of Blackpool, is the architect, and Mr. J. Cocker, of Walkden, the contractor.

HOVE.—For extensions at the Infectious Diseases Hospital, the Town Council has accepted the tender of Messrs. Peerless, Dennis and Co., of Eastbourne, at £5,236.

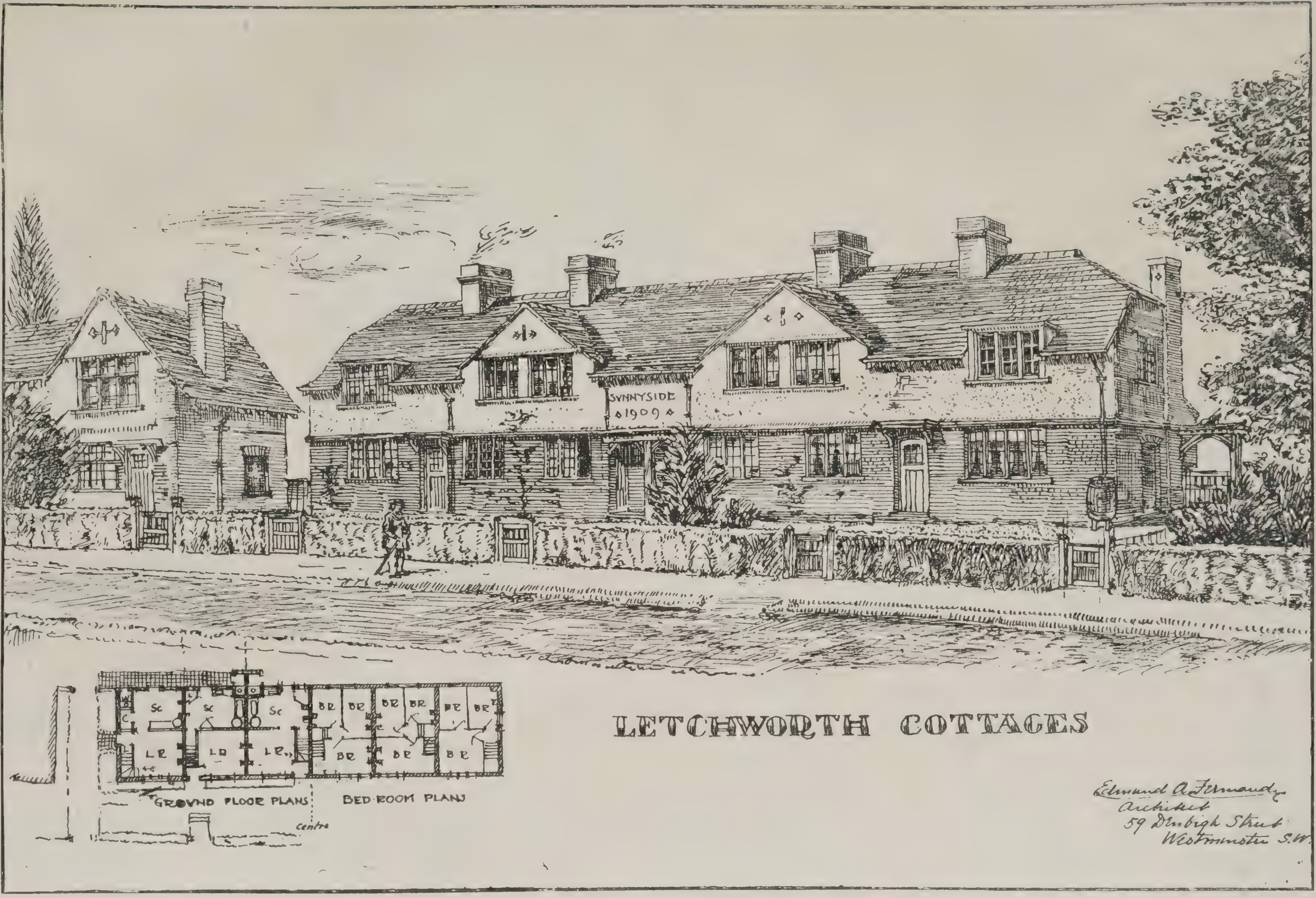
HOWRAH (INDIA).—The provision of a separate building to accommodate the office of the Superintendent of Police, the Court "hajat," the "malkhana," and the Court Inspector's office having been sanctioned, the local P.W.D. are taking steps to erect the necessary building, which will be a two-storied "pucca" structure with terraced floor and roof, over steel joists and tees. The estimated cost of the proposed building is Rs.35,600 (about £2,374).

HULL.—The new post-office is to be opened by the Postmaster-General on July 22nd. The building in Renaissance style is situated at the corner of Lowgate and Alfred Gelder Street, and has been designed by Mr. W. Pott, A.R.I.B.A., of H.M. Office of Works. Messrs. Arnold and Sons, of Doncaster, are the contractors, and the cost has been £53,000. Mr. James Atkinson, of H.M. Office of Works, supervised the work of erection.

KIRKCALDY.—A new Salvation Army Citadel has been erected here by Mr. Robert Frew, Cupar. Mr. W. Dow, of Kirkcaldy, was the architect, and the following were contractors for various works:—Mason, Messrs. Wright and Reekie; joiner, Mr. David Simpson; plumber, Mr. Jas. Blyth; plasterer, Mr. Wm. Grant; slater, Mr. Wm. Currie; glaziers, Messrs. James Haxton and Co., of Kircaldy.

LEEDS.—The new district Church of St. Hugh, Armley Lodge Road, has been erected at a cost of about £5,000.Mr. H. S. Chorley, of Leeds, was the architect.

LIVERPOOL.—The repair of the roof of the Philharmonic Hall is rapidly progressing under the supervision of Messrs. T. Mellard Reade and Son, architects to the society, in consultation with Mr. Hall Blyth, M.Inst.C.E., of Edinbugh. The contractors are Messrs. Jones and Son, Pleasant Street, Liverpool, and the steelwork is being supplied by Messrs. Redpath, Brown, and Co., of Trafford Park, Manchester. One of the



COTTAGES, LETCHWORTH. EDWARD A. FERMAUD, ARCHITECT.

This design, placed first by the Committee of Assessors at the last Letchworth Cottage Exhibition, is for a block of six cottages with frontages of 16 feet. Two serviceable rooms are provided on the ground floor in preference to the usual parlour, kitchen and projecting scullery, which in many cases interferes with light and prospect. The walls are faced with red bricks with cement roughcast to upper part. The roof is tiled. The living rooms have wood block floors (on 6 inch cement concrete) in order to avoid vermin. The first floor is pugged and plastered between joists which are left exposed and stained. The partitions on upper floor are solid and finish 3ins. thick. Mr. E. A. Fermaud of 59, Denbigh Street, Westminster, is the architect.

great difficulties was to design the new superstructure so that it could be erected without exposing the interior decorations of the hall to possible damage from the weather. The steel frame superstructure, weighing some 50 tons, is being built over the old roof four feet above its ultimate level, and when all is ready the old roof will be cut open, and the whole of the new structure lowered by hydraulic jacks on to its beds on the four-brick piers at each corner of the hall, and the ceiling secured. The new roof, which is to be covered with copper for lightness, will then be completed and all covered in. From the exterior the new roof will appear as two large pediments or gables above and at either end of the old roof; and along the centre, for a width of 12ft. on either side of the ridge, the new roof will run from gable to gable at a height of about eight feet above the old roof. During the operations now in progress the whole roof and ceiling are being supported temporarily by 14 wood skeleton towers, 70ft. high from the floor to the roof, and those who only know the hall during the concert season would doubtless be surprised to see the avenues of timbering which now occupy the auditorium. It is expected that the work will be completed early in September.

LONDON.—The Marylebone Borough Council have accepted the tender of Mr. B. E. Nightingale, of Albert Works, Lambeth, at £13,560, for the erection of the new borough depot buildings.

LONDONDERRY.—The corporation have had plans and a specification prepared by Mr. W. E. Pinkerton, for rebuilding the Guildhall, which was burnt out some time ago. These plans and the specification have been submitted to the City Surveyor and to the Town Clerk, who are reported to have stated that they could not advise the corporation to place them before the quantity surveyor, as they were not in the requisite form for the lump sum contract, which the corporation desired. After a very protracted discussion, during which Mr. Pinkerton refuted the suggestion that the plans and specifications were not in a fit state to go before the quantity surveyor, the corporation decided, under their agreement with Mr. Pinkerton, to take them over and pay him the sum of £300 for his services. Mr. Pinkerton refused to accept the sum as a settlement of his claim; but the Mayor intimated that the Corporation would consider any claim for extra work.

LONGTON.—The new post-office in Chancery Lane has been formally opened. The cost has been £3,500, and the contractors were Messrs. Tompkinson and Battelley, of Longton.

MADRAS (INDIA).—The Madras Council is considering designs for the new Council Chamber and offices to be erected shortly on the site of the Old Banqueting Hall behind the Secretariat Buildings in Fort St. George. The cost is estimated at two lakhs of rupees (about £13,400).

MANSELTON.—A new English Baptist Chapel, to seat 650, is being erected in late Gothic style, of local stone, with blue Pennant stone facings and Bath stone dressings. Mr. W. Beddoe Rees, Cardiff, is the architect, and Messrs. Turner and Sons, Cardiff, are the builders. The cost will be about £3,000.

MOUNTAIN ASH.—The nave and aisles of the new Church of St. John the Baptist, Miskin, have been completed, and the building has been consecrated for worship. The present accommodation is for 485 persons; but when the chancel, vestries, and parish rooms have been added, there will be a total accommodation of 515 sittings. The building is faced with grey pennant stone with the traceries of St. Aldhelm stone, and the roofs are covered with green Bangor slates. Mr. E. M. Bruce Vaughan, Cardiff, was the architect, and Messrs. E. Turner and Sons, of Cardiff, were the contractors. The cost has been £3,500.

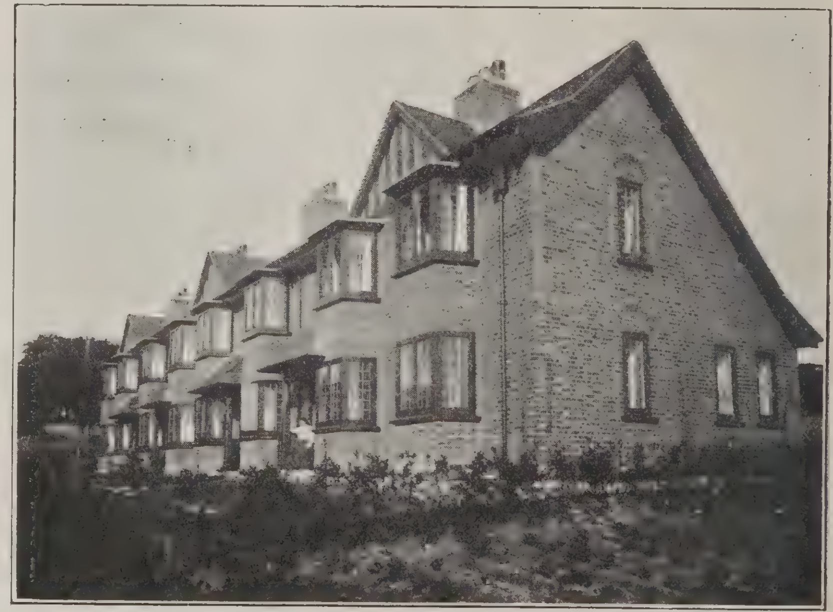
NEWPORT (MON.).—The foundation stone of the Technical Institute at the junction of Clarence Place and Rodney Street, has been laid. The building, with equipment, will cost about £40,000, is to be finished by July, 1910, and has been designed by Mr. C. F. Ward, A.R.I.B.A., the borough architect. Mr. W. E. Blake, of Plymouth, is the contractor.

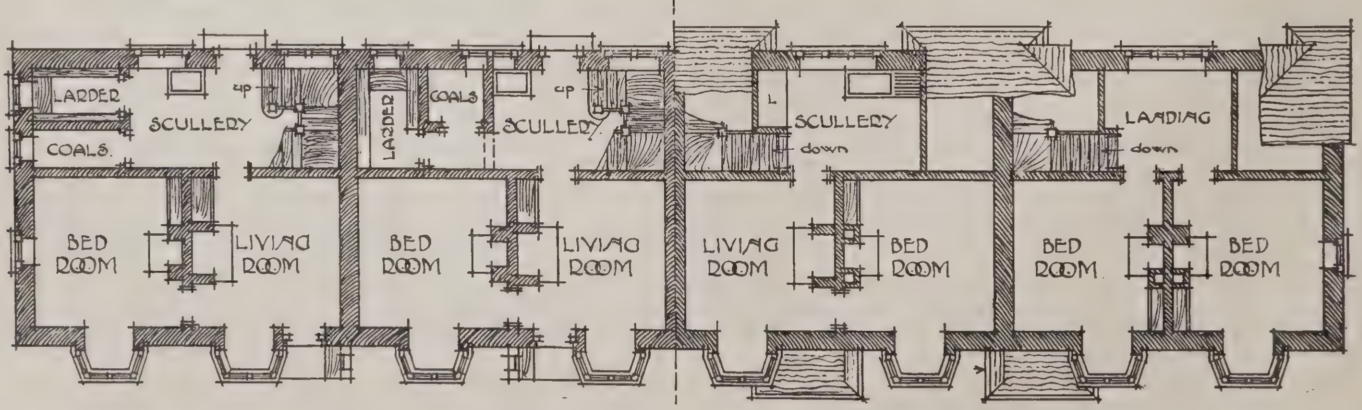
NORTHAMPTON.—The contract for the rebuilding of Messrs. T. C. Mann and Sons' factory, which was burnt down at the beginning of the year, has been secured by Messrs. Sharp and Robinson, of Earls Barton, and operations are now in progress.

ST. PAUL'S BRIDGE.

After long deliberation, the Bridge House Estates Committee of the Corporation of the City of London have decided to recommend a drastic improvement of the means of communication between north and south London via the City. The committee, after considering the matter for four years, have decided to recommend that, while the gradient of Southwark Bridge shall be improved, a new bridge shall be provided between it and Blackfriars Bridge, and shall be continued by a viaduct to Cannon Street, near the east end of St. Paul's Cathedral. The estimated cost of the two schemes is nearly £1,878,000.

In their report, which will be submitted to the Court of Common Council at its next meeting, the committee point out that additional means for meeting the requirements of cross-river traffic within the City are urgently needed. During the busy hours of the day, when easy transit is most required, the bridges serving the City (with the exception of Southwark Bridge) are greatly congested, and the need of an additional traffic artery is obvious. Southwark Bridge would suggest itself as being, if reconstructed, the means by which relief might be obtained. The construction of an approach wide enough to render a new Southwark Bridge a successful undertaking would, however, involve the acquisition of property so costly as to make the undertaking almost prohibitive. To construct a short approach, ending in Queen Victoria Street or Cannon Street, would only have the effect of creating congestion in an area the traffic of which is already difficult to deal with, owing to the two lines of east and west traffic at the Man-





HOUSE OF REST, WHEATLEY, OXON. S. STALLARD, ARCHITECT.

These cottage homes are built of red brick with tiled roofs, and the exterior woodwork is stained brown.

sion House Station diverging and crossing each other, and meeting others coming in an opposite direction.

Realising, however, the necessity of providing improved means of communication, the committee instructed Mr. Basil Mott, C.E., to report (1) on the best method of reconstructing Southwark Bridge, (2) on the question of constructing a new bridge between Southwark Bridge and Blackfriars Bridge, and (3) on the best means of improving the present gradients of Southwark Bridge. Mr. Mott submitted plans showing three different methods of reconstructing Southwark Bridge:—(*a*) for a new bridge with a new northern approach by a viaduct over Thames Street to Queen Victoria Street, at a cost of £878,325, or if widened to 80ft., £966,574; (*b*) for a new bridge on its present site, with a new approach to Queen Victoria Street as in scheme (*a*) at a cost of £876,194, or if widened to 80ft., £964,443; and (*c*) for reconstructing the present bridge, with a viaduct over Thames Street to Cannon Street, with two new approaches from Thames Street to the bridge, at a cost of £1,086,225.

With regard to the construction of a new bridge, Mr. Mott's report suggested the erection of a new bridge, commencing at the junction of Southwark Street and Southwark Bridge Road, ascending in a north-westerly direction, crossing the river in three spans, and then being continued by a viaduct over Upper Thames Street and Queen-Victoria Street, terminating at Cannon Street, near St. Paul's Cathedral. The construction of such a bridge would have the effect of creating a new north and south thoroughfare. The bridge, which is provisionally indicated by the name of "St. Paul's Bridge," is shown in the plan as widened to 80ft. to accommodate tramways from its southern end to its termination in Cannon Street. An improvement which might be carried out in the future is the acquisition of certain property north of Cannon Street and to the east of the Cathedral, in order to carry the thoroughfare to St. Martin's-le-Grand.

In this scheme the tramways, on reaching the north side, would dip into a subway and ascend in Aldersgate Street, thus avoiding interference with the surface traffic in the City. The estimated net cost of constructing the suggested new bridge 80ft. wide is £1,646,983.

In all plans for rebuilding Southwark Bridge, the committee state the subject of the northern approach will be the vital point; and such an approach cannot be made without absorbing a large area of most valuable property, the cost of which makes it improbable that it will ever be attempted. It therefore appeared to them useless to proceed with the proposals referred to; but it was continually being urged upon them that the heavy traffic in Thames Street should be afforded an improved outlet to the south side of the river.

They therefore had prepared a plan showing an improvement of Southwark Bridge by lowering the crown of the arches and reducing the gradient to 1 in 33. The estimated cost of this proposal, including compensations, is £231,000, and Thames Street and the streets communicating with it are not interfered with.

As to the proposed new bridge, "the possibility of obtaining a new north and south thoroughfare capable of accommodating tramways without interference with the surface traffic of the City is a highly desirable and attractive one." In the opinion of the committee, therefore, the proposals that should be adopted are—(*a*) the new bridge at an estimated cost of £1,646,983; and (*b*) the improvement of the gradients of Southwark Bridge at an estimated cost of £231,000.

The work would be carried out without cost to the ratepayers, from the Bridge House Estates funds, which, it will be within the recollection of readers, supplied the money for erecting the Tower Bridge.

Fire Prevention Notes.

A Homely Little Homily. A useful little homily on fire prevention, appearing in a popular medical journal, insists on such obvious truisms as to raise a temporary suspicion that they were intended to be addressed to the nursery. Thus, we are told that lamps and candles should not be set where draperies can be blown to them, that ashes should be taken up in a fireproof vessel, and that care should be exercised in the use of paraffin. Unfortunately, the adults of the community show in nothing more clearly than in their general recklessness with regard to fire that they are "but little children of a larger growth," and that therefore this very elementary advice is by no means superfluous. Nor can it be said that the equally rudimentary remarks on building are unnecessary. "Far too little attention to safety from fire," remarks our homilist, "is paid in building. Besides the use of inflammable materials, there are often inaccessible little cubby-holes and attics; chimneys or pipe-holes in unsafe places; the water supply in the most unhandy position; and no provision made for reaching the roof." This is only too true; but the writer sets up a somewhat dubious doctrine when, after delivering himself of the further truism that "a little forethough in planning a house would often make it safer," he suggests that "the money sometimes spent in needless ornamentation would pay for the most important parts being of fireproof materials, insuring almost entire safety." It is true that there is here much virtue in the word "needless"; but the suggestion of any sort of rivalry between fire-prevention and æsthetics is also needless, and might tend to the utter discouragement of the babes and sucklings, to whom the writer is endeavouring to teach the ABC of the subject.

Pioneer Efforts in Fireproofing. For the first strenuous attempts at rendering buildings fireproof it is natural to turn to American records. As long ago as 1856, Mr. Peterson, architect, used, with this object, hand-made hollow tiles in the first floor of the Cooper Institute, New York. Later, the Fireproof Building Company, of New York, were endeavouring to protect ironwork from the effects of fire by coating it with a composition of plaster of Paris and a French cement known as lime of Tiel, and they used hollow blocks that were made in accordance with the system invented by Garcin in 1867. A hollow-tile floor, invented by George H. Johnson, was used in the New York Post Office about 1872, and in the same year that gentleman rebuilt the Equitable Building, which had been destroyed in the great Chicago fire, with hard-burned hollow clay blocks, a system that he also applied in a building for the Singer Sewing Machine Company at St. Louis. Flat arches of burned clay were used in the halls of the New York Coal and Iron Exchange, which was built about 1876 by the Fireproof Building Company from the plans of Mr. Richard M. Hunt, who later adopted a similar specification for the floors of the "Tribune" building. In 1875 and 1876, Mr. Thaddeus Hyatt, an American, made exhaustive experiments with reinforced concrete in England, and chronicled the results in a book that was circulated privately in 1877. In 1876, Mr. William L. Ward, of Portchester, commissioned Mr. Robert Mook, architect, to build a large house, in which the walls, floors, roof, partitions, and porches, are of reinforced concrete, and this, so far as is known, is the first instance of the structural use of reinforced concrete in America. Other early examples of fireproof construction in America are as follows:—In 1875 the first cast-iron columns fire-proofed with burned clay were used in the Chicago Club, porous terra-cotta blocks being fastened to the column with screws. In 1878 the floor arches of Cook County Court House at Chicago were built with flat hollow tiles. In 1880 the Chicago City Hall was the first large public building of which the entire interior was constructed with hard-burned hollow tile, with hollow-tile fireproofing for all columns and girders, and a hollow brick-tile roof. In 1879 parts of the Chamber of Commerce at Milwaukee were fireproofed with porous terra-cotta, of which blocks were screwed to the iron columns, while the ceilings were covered with 2in. tiles screwed to the floor-joists. Similar construction was adopted in the same year with respect to the 500 columns supporting a large store built by Mr. Ferry, at Detroit. Another building, erected a few years later—the Grannis Building, Chicago—was burnt out, and when the columns, which had fallen in the general wreckage, were examined, it was found that the fireproofing was still attached to them, uninjured. The first office building of fireproof construction throughout, in the modern style, was the Montauk, in Chicago, which was erected in 1881-2, and is noteworthy as being the first in which concrete and iron grille foundations were used. It successfully withstood a severe fire in an adjacent building. It was taken down in 1907. The first building in which the bottoms of the iron beams were protected by burned-clay tiles was the Mutual Life Insurance Building in New York City; the contractor having patented a method by which the soffit tiles could be held in place. This building was erected in 1883-4.

Fire Prevention in Germany. The special commission of the executive officers of the British Fire Prevention Committee, which visited Berlin and Hamburg, have returned to London. The commission comprised half-a-dozen prominent officials of the committee. The questions examined by the commission on the journey related chiefly to the construction of large drapery stores, warehouses, theatres, schools, and hospitals. The commission also viewed a number of petroleum stores, scenes of fires, and they had an opportunity of inspecting a number of new fire stations and of witnessing demonstrations with modern fire appliances. On their journey outwards they visited Hanover, and some of the members of the commission also visited Kiel. At Berlin the occasion of the visit was taken by the chief officer of the Royal Police Fire Brigade to arrange a special display of the working of his brigade. The arrangements for the journey having been carefully prepared in advance, and the authorities having put all possible facilities at the disposal of the commission, a mass of useful data was obtained, and it is intended to publish the information thus obtained.

Fire Prevention a Duty. An extensive fire at Bromley, in Kent, last month, emphasises the fact that there is an enormous field for missionary work with respect to fire prevention. Bromley, which but a few years ago was little more than a village, has grown rapidly to the dimensions of an authentic and unquestionable town; and yet apparently it is being built up without very much regard for modern fireproofing methods. But, leaving Bromley out of the question, it is certain that, in spite of all precept and example, there is still too much trusting to luck in the construction not only of dwellings but of business premises. Immediate interest—the saving of a few pounds on the contract—seems to outweigh any consideration of the terrible risks that are involved in neglect of the available means of fire prevention. It is for this reason that some day—probably as the result of some disaster of appalling magnitude—legislation will compel proper precautions against the outbreak of fire, and more particularly against its extension. It would seem to be feasible that the occupant of a house has a moral right to demand protection against the destruction of his property and the risk to his life that may arise from the failure of his neighbours to adopt known means of confining an outbreak of fire to the apartment in which it originates.

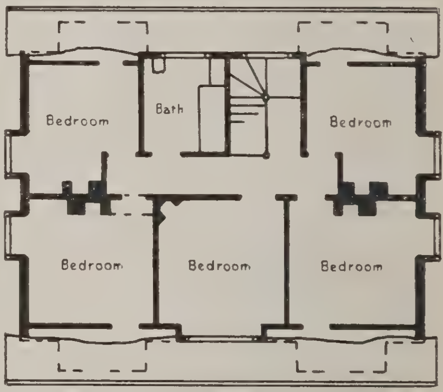
The Fastening of Fire Doors. A glance over the photographs of several of the fire door tests that have been carried out by the B.F.P.C. suggests an interesting point that should be of some moment to the manufacturers of doors other than roller shutter doors, and also to the architects who contemplate using them. That point is concerned with the arrangements for securing the door. In the majority of the tests, however well the door stood the tests, a tendency was shown to buckle inwards at the top and bottom corners of the doors, allowing the flame to pass over, under, or round them. In later tests this was obviated by securing the door with additional bolts at the top or bottom of the opening side, and in one case the door was secured by three bolts on the opening side, and on the hinge side by the two hinges and, half-way down, by a lug shutting into a slot when the door was closed. This arrangement kept the door tightly secured to the frame and prevented the door warping or buckling or allowing any flame to pass. The point is worthy of attention. But as a corollary, it is also necessary to arrange that the three bolts on the opening side can be shot or drawn simultaneously. In case of fire, every moment is of importance, and in the general excitement, and, perhaps panic, it is not well to leave too much for the human element to achieve in the face of danger.

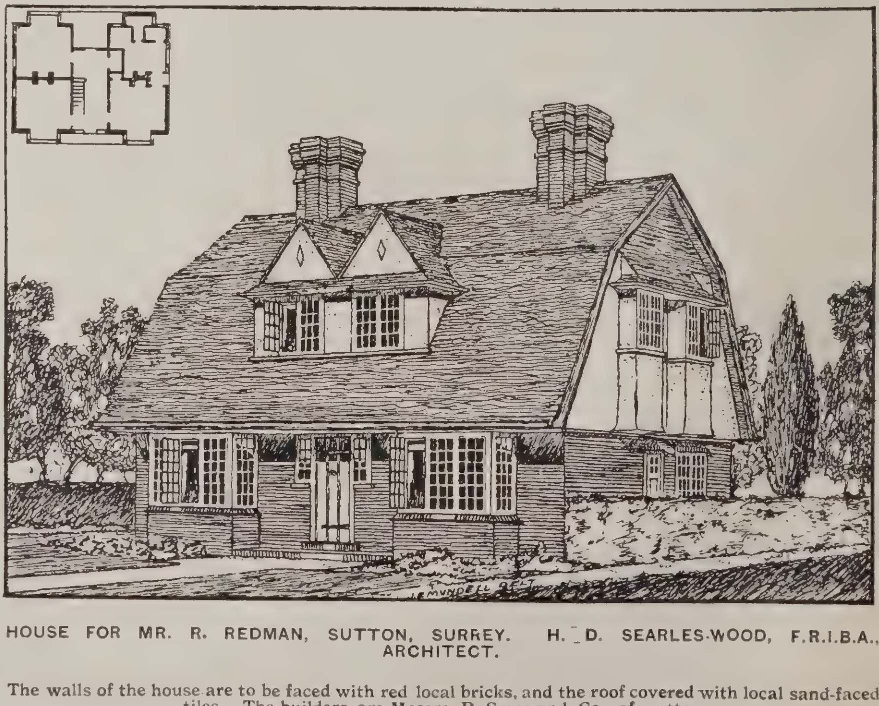
Fire Tests. During the present month additional tests with roller shutter doors will be undertaken. A further series of tests with fire extinguishers has been arranged. Of tests undertaken during the past month, there were tests with three doors, one of which was a 3-ply wood, asbestos protected "armoured" door to a 7ft. opening. Another was a similar door, but 2-ply, into an opening of about 3ft. The third was with an iron door. The British Fire Prevention Committee will in due course issue reports upon these tests.

Fireproof Construction and the By-laws. The Committee of the House of Commons, of which Mr. Mooney is chairman, have given decision on Part V. of the London County Council (General Powers) Bill, under which it is proposed to amend the London Building Acts, 1904 to 1908, with special reference to buildings of iron and steel skeleton construction, and to make regulations as to the use of reinforced concrete. Clause 30, sub-clause (33), provides that any person dissatisfied with any requirement or decision of the district surveyor in regard to metal skeleton framework construction may appeal to the County Council, whose decision is to be final. The Tribunal of Appeal established under the Act of 1894, had been substituted for the County Council, but the committee directed that the appeal should be to a police-court magistrate. Sub-clause (34) provides that, in order to facilitate the erection of buildings of metal skeleton framework, the Council may modify or waive any of the requirements of Clause 30 "upon any subject to such terms and conditions as they may think fit, and any person failing to comply with any such term or condition shall be liable to a penalty, to be recoverable in a summary manner, not exceeding £20, and to a daily penalty not exceeding the like amount." The committee decided that there should be, in regard to this provision, an appeal to the Tribunal of Appeal. They also directed that Clause 33 (increased fee to district surveyor in certain cases) should be altered so as to make clear the exact basis on which the fees of the district surveyor were to be calculated in the case of the alteration of an existing building of metal skeleton framework construction. The committee found the preamble of the Bill proved.

ROMAN KITCHENS AND ROMAN COOKERY.

Co-existent with the advanced state of civilisation and luxury closely identified with the establishment of the ancient Roman empire, was the cult of cookery by the gluttonous old time denizens of the eternal city. Doubtless much of the culinary skill of the Romans was inherited from the Greeks who, in their turn, acquired it from other nations, perhaps more particularly from the Egyptians and Lydians, whose cooks were in great request, when Athens reigned supreme over Hellenic national life. But whatever degree of excellence in the refinements of civilisation may have been obtained by their illustrious predecessors, it was reserved to the Roman conquerors of the world to raise gastronomy to the level of a fine art. Thus the "culina" or kitchen, necessarily became one of the most important of the many stately apartments of the Roman mansion. In addition to the periodical banquets provided for the delectation of their personal friends (which led the rich citizens of Rome to sweep land and sea to furnish food for the gastronomical orgies at which they were accustomed to pass whole days or nights), it was usual for the wealthy City parvenu to distribute, day by day, an immense amount of food to his humble dependents ("clientes") and it thus became necessary for him to pay special attention to the culinary department of his household. Many of the kitchens attached to Roman houses presented the appearance of large vaulted halls, wooden ceilings being eschewed in order to lessen the possibility of accidental fire, and an ancient inscription, discovered many years ago at Palestrina, instances a kitchen no less than 148ft. in length, but this particular *Culina* does not appear to have been of more than average size. The Roman kitchen was profusely decorated, its walls being elaborately painted, often with a representation of the *Fornacalia* (a festival in honour of *Fornax*, the goddess of furnaces), varied by paintings of fish, poultry, and game. One of the most noticeable features of the room was its paving, usually consisting of a fine black composition possessing the extremely useful property of rapidly absorbing water, and thus the floor of the Roman kitchen always remained dry. Over the hearth (*caminus*) upon which the fire for cooking was laid, there was a large archway (*fornix*) constructed to afford a ready vent for the smoke. Subsidiary offices, planned for use in connexion with the *Culina*, were the *Olearium*, for storing oil, the *Horreum*, a storehouse for winter provisions, the *Pistrinum* or bakehouse, which was separated from the main building as a precaution against the spread of fire, the granaries and the wine cellars. The latter were often of enormous size. It is said that the cellars of Hortensius, the orator, contained no less than 10,000 casks of Arvisian wine. The wine cellars and granaries were usually placed upon the north side of the house to protect their contents from the damage which might otherwise occur through exposure to the heat of the sun, and refinement was sometimes carried to the remarkable extent of perfuming the cellars for the purpose of giving the wine a superior flavour. A branch of cookery on which the Roman *chefs* especially prided themselves was that of making artificial birds and fishes of such delicious flavour that their exquisite taste is said to have excelled the reality. Their skill in the art of making bread, of which Pliny mentions four kinds, was also very noticeable.





HOUSE FOR MR. R. REDMAN, SUTTON, SURREY. H. D. SEARLES-WOOD, F.R.I.B.A., ARCHITECT.

The walls of the house are to be faced with red local bricks, and the roof covered with local sand-faced tiles. The builders are Messrs. R. Smee and Co., of Sutton.

THE CONCRETE INSTITUTE.

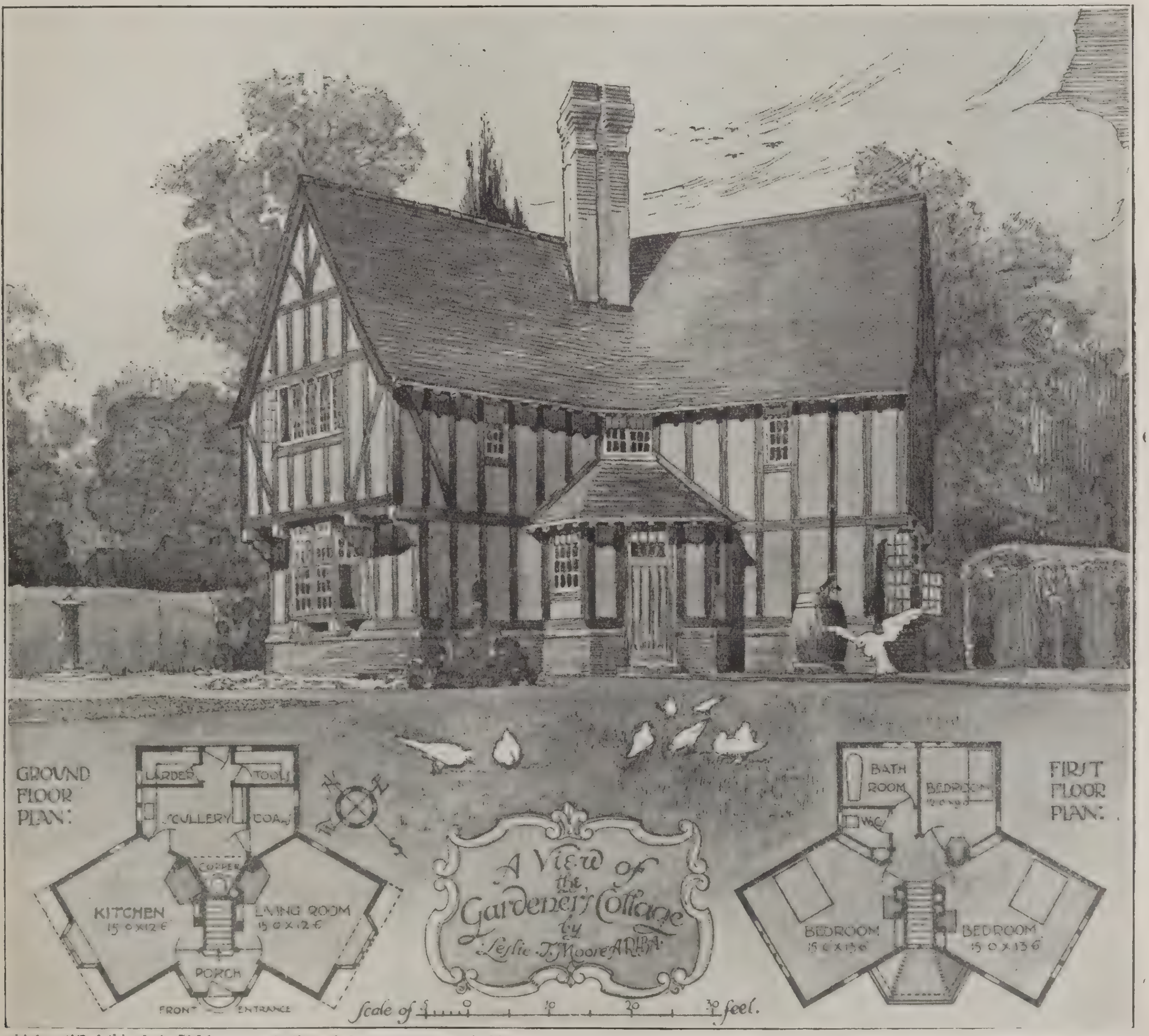
The Setting of Portland Cement.

A general meeting of the members of the Concrete Institute was held on Thursday evening, June 17th, at the Royal United Service Institution, Whitehall, S.W., for the purpose of resuming the debate, adjourned from the previous meeting, upon a paper read by Mr. H. K. G. Bamber, F.C.S., on the setting of Portland cement, and the methods adopted for regulating same. Mr. F. E. Wentworth-Shields, M.I.C.E., presided, and a somewhat protracted, but interesting, discussion took place, among those present being: Messrs. Bamber, E. P. Wells, J.P. (hon. treasurer), H. Kempton Dyson (secretary), Blount, W. H. Reid, J. W. Plaistor, A. O. Trechmann, Wm. Gilbert, G. B. Blyth, J. F. Fenwick, J. W. Davis, etc.

The Chairman said that a suggestion was made at the previous meeting that M. Le Chatelier, the author of the famous cement test which bore his name, should be invited to attend that evening and take part in the discussion. Unfortunately, he had not been able to come, but he had written from Paris to Mr. Bamber, who had made a translation of the letter.

Mr. Bamber then read the translation of M. Le Chatelier's letter, which dealt with the questions of tricalcic silicate, quickness of setting, hydration of cement by steam, and tests of the unchangeability of volume and heat. Mr. Bamber remarked that he much regretted M. Le Chatelier's inability to be present, but he wished to express their indebtedness to that gentleman for the trouble he had taken in sending a few notes on the subject before them. He was glad to accept the assurance of M. Le Chatelier that the many theoretical difficulties of the supposed complex chemical combinations that might be formed had not the importance usually attributed to them, and further, that they had nothing to do with the practical application of cement. He thought, therefore, that the manufacturer might well leave these questions to the specialists, and that the consumer need not worry himself about the chemical side of the question, but should confine himself to seeing that his cement conformed to the specification.

Mr. Walter Reid, F.I.C., said that with regard to Mr. Bamber's observation as to lime being present in cement in a different form from that in which they were accustomed to see lime, and in which it slaked and expanded considerably in volume, he thought that was a remark of the greatest importance. In many cases they had got no lime, and when they put the product in water it did not slake at all, yet after a time the water in which it was put became alkaline, and caked up lime. There could be no doubt whatever that at the temperature at which cement was clinkered, lime did exist in a different state from what it did in ordinary lime, and was one of the reasons why the search after free lime had given so much trouble to different investigators. In practice it had been found that that form of lime could be produced in another way in connection with limelights. Lime for limelights were made of caustic lime highly compressed and saturated with nitrate of lime, and calcined at a high temperature. The process was repeated, and they got a substance, almost metallic in its hardness, which would stand the atmosphere for a very long time indeed. He had made many thousands of tons of cement in the old way, with the old kilns, but his experience led him to the conclusion that fuel ash had very little to do with the setting of the whole charge of the kiln. Over and over again he had picked out pieces of clinker from a kiln and ground them separately, and found that they more or less agreed with the setting of the bulk of the charge from the same kiln. To his mind, it was quite impossible that the small percentage of ash which was contained in the fuel could have any appreciable effect on the



The chief motif of this design is the concentration of flues to one central chimney stack. The "Y" form of plant adapts itself admirably in this respect, also to simplicity in roofing. The rooms are a pleasing shape, all having fireplaces suitably placed. Externally the cottage forms a picturesque whole; gaining all the advantages of aspect. The general framing, standing on a brick base, is to be of local hewn oak, left from the adze, filled in between with brick nogging, the panels being finished in plaster. The tiling of the roof is to be eased round the internal (obtuse) angles, following the old methods. The roof could equally well be thatched where the material is available. Mr. Leslie T. Moore, of 3, Raymond Buildings, Grays Inn, is the Architecet.

time of setting of the cement, and he definitely stated, as the result of his experience, that the time of setting was dependent on the composition of the material as it was put into the kiln, and only in a very small degree indeed upon the small fraction of ash that might be derived from the fuel. With regard to the action of carbonic anhydrite on cement, he did not think it did so act in practice; it could only be when it was combined with water that it would act. With regard to the actual materials that were present in cement, he thought one ought to bear in mind the fact that chemical substances nearly related to each other almost always dissolved each other, and he thought the hope of isolating definite compounds from the clinker itself was altogether illusory, because there was no doubt that the silicates formed in the clinker, and the aluminates were so closely allied chemically that they acted as mutual solvents. They were almost driven to the method of experimenting which Mr. Bamber had himself carried out, viz., the formation of different silicates, and the testing of them separately. With regard to carbonate of lime being inert in the mass, Mr. Bamber treated it as if it were absolutely inert, but he thought there was no question at all that carbonate of lime was an important ingredient in mortar, and that it was not absolutely inert. The other day he examined some mortar which was probably 4,000 years old, and then there was the mortar from Pompeii, which he had also examined, and that contained as an important ingredient powdered marble. The lime that was used as a plaster, whether with sand or alone, would certainly not have stood like those ancient mortars in which, as Vitruvius told them, the mortar was made up with powdered carbonate of lime in a hard form. Therefore, he did not think that if cement had been weathered they should assume that, because a certain portion of the mass became hydrated, it was inert. With regard to the question of reducing or lengthening the time of setting, some interesting experiments were made a number of years ago with regard to the action of moisture in lengthening the time of setting. They were first carried out, he thought, on a large scale in Germany in the ring kiln, where they used to sprinkle water on the clinker before it was cold, and they found a material advantage in doing that, the cement setting more slowly, and altogether it was considered a great commercial advantage, and was indeed at that time kept a secret. But, curiously, he had previously done it himself at Rugby in cases where the stone was not so intimately mixed as it might be, and there was almost visible free lime in the clinker. The ingenious process that had been devised by Mr. Bamber for carrying out the partial hydration in a measured way was likely to get over any difficulty that might still remain in that particular operation, and he congratulated Mr. Bamber on having thought out so accurately a method of carrying out the operation on a manufacturing scale.

Mr. Wm. Gilbert, M.I.C.E., said he would like to ask if the setting time of cement was better controlled by preserving the high temperature of 180 degrees Fahr. than the more usual temperature of 140 degrees. With regard to the Le Chatelier test, it appeared to be a weak point in it that no measurement of expansion was commenced until the cement had been immersed in water for 24 hours.

Mr. Trechmann said he thought that the rotary kiln was rapidly developing, but he did not think that Mr. Bamber had entirely made out a case against the fixed kiln. As to the quantity of fuel used in the competing processes, some types of fixed kilns consumed over 33 per cent. less than the best handled rotary kilns.

Mr. J. B. Blyth said he believed the rotary kiln would very shortly take a second place. He would not say that the cement manufacturers were sick of rotaries, but they were so enamoured of something else that they had given an order for eight brace on spec. With regard to the setting time, he mentioned some cement with which he had got a quicker setting time in a damp carriage house at his works than in a dry sample room. He thought the different results which they now obtained in the setting time were due to the fine grinding, which made some peculiar difference that was not shown by chemical analysis, and which did not obtain in the good, old coarse-ground days. He suggested that if users wanted to "slow" their cement it would be better to add 4 per cent. of water when they gauged up the cement than to leave the manufacturer to put it in some time previously. Personally, he was strongly opposed to the Le Chatelier test, which he thought was most misleading. With regard to cheap cement, he thought the most excellent thing that all users of cement could do was to eliminate the bottom tender of all.

Mr. J. W. Plaister said he had a strong prejudice in favour of steam aeration of cement, but he was convinced that with certain classes of clinker nothing could beat the cooling of it by exposure to the air, more especially for getting a good initial set. He would like to mention, however, that he had seen cement put into extremely important work which had been absolutely ruined by the suicidal mania for over-aeration.

Mr. J. W. Davis remarked that he had found that well-burnt intermittent kiln clinker had an almost instantaneous set. He had yet to learn that anybody could produce clinker from rotary kilns, made with chalk and clay, that was anything but quick setting when it was first ground, unless it was treated by some method for the purpose of retarding the initial setting time.

Mr. G. F. Fenwick having also spoken,

Mr. Bamber replied to the discussion both at that meeting and at the previous gathering. He agreed, he said, that the National Physical Laboratory might well take up the question of the composition of cement and thoroughly investigate it. He claimed that in some form or other the system of hydration of cement was being carried out at every works in the United Kingdom. He did not state that fuel ash had any very great effect on the setting time of cement, but he thought it might possibly have some effect in slightly retarding the setting time. As to carbonate of lime not being an inert substance, he had learned that for the first time. With regard to the temperature for the setting time being kept high, the effect was always greater and more rapid if they did it at a high temperature. It enabled them to produce a cement straight from the tube mill without aeration of any sort, which, when tested by the Le Chatelier test did not expand even the 10 millimetres referred to in the British Standard specification, and it was common to get cement tested within an hour of leaving the mill expanding only 1 millimetre. Possibly half the cement manufactured in this country was manufactured by the rotary process, and he thought the possibility of that proportion being increased was near at hand.

A Kansas City firm has offered Prof. Duncan $1,500 a year for two years to be awarded to some student to spend his time hunting for more uses for Portland cement. This provision is of unusual interest to the people of Kansas, as the cement industry promises to be one of the large interests of the State, and every new practical use discovered for the product will help the industry greatly. The chemist who secures this scholarship is to spend his time partly in the university laboratories, and partly in visiting the various cement mills in the State. He will conduct all kinds of experiments, and Prof. Duncan feels confident that he will be able to find new uses for cement. In all the leading universities of America, as well as at State and Government experiment stations, cement is receiving much consideration from both chemical and engineering standpoints. No other material is receiving equal attention. The explanation is that cement is fast becoming the most useful structural material of the age.

Federation News.

BARNSLEY ASSOCIATION.

Secretary: J. Denton.

At the monthly meeting of the Barnsley Federation of Building Trade Employers, held the the King's Head Hotel, Barnsley, on June 9th, Coun. G. Haigh (president), who occupied the chair, was supported by seventeen members. Four new members were unanimously elected.

The report of the last Yorkshire meeting was submitted by Mr. E. Broley. A small committee was appointed to make arrangements for the forthcoming annual outing, when there is to be a cricket match, "Barnsley Master Builders" versus "Rest of Federation."

A short report of the Local Conciliation Board annual meeting was submitted by Mr. C. D. Potter, who remarked upon the good feelings existing between masters and men, and the very light duties of the Conciliation Board. He had nothing of importance to report.

The president (Councillor G. Haigh), submitted a short account of the Barnsley Master Builders' tour in Ireland, describing in detail the beauties and the grand scenery of the North of Ireland. Mr. P. Dalby corroborated.

Mr. C. D. Potter introduced a suggestion, which he threw open for debate, for curtailing the various holidays of the year, and having one full week in August. Mr. F. Goodyear was in sympathy with this suggestion, but was unable to see how the minor holidays could be curtailed. Mr. E. Broley and the president suggested that the matter should be discussed at the next Conciliation Board meeting, in order that the feelings of the men could be ascertained. Mr. T. Lindley did not think it would be wise to interfere with the other holidays, and thought it would be very difficult to get a universal week's holiday. He cited the unsuccessful efforts in this direction lately made in Sheffield. Mr. C. D. Potter, in reply, admitted the difficulties, but was of opinion that they could be easily surmounted. Mr. J. Smith asked whether this question had not been previously discussed and shelved at a town's meeting. He foresaw great difficulties. Mr. H. Ashworth remarked that the building trades could manage the week's holiday themselves. Councillor W. G. England, J.P., agreed that a full week's holiday during Barnsley feast week was very desirable. Mr. C. D. Potter, in a final reply, contended that the holidays could be consolidated, and that the tradesmen connected with the building and allied trades would welcome the suggested week's holiday. Ultimately it was resolved, on the motion of Councillor W. G. England, J.P., that the matter be thoroughly discussed at the next meeting of the Local Conciliation Board.

Mr. T. Lindley reported upon the preliminary arrangements made in connection with the forthcoming visit of the Belgian Master Builders' visit to Sheffield. These were as follows: Arrive at Victoria Station, Sheffield, Tuesday morning, second week in August, a civic welcome being extended to them by the mayor and corporation. Various large works to be visited in the afternoon, followed by a banquet. Wednesday, visits to large steel works, and drive, probably to Chatsworth House. A hearty invitation is given to all members of building trades Federations to attend.

BATH ASSOCIATION.

Secretary: E. J. B. Mercer.

On June 23rd, members of the Bath Association and their friends (the party numbering sixty-five), had their nineteenth annual outing, when, as was reported in last week's issue, Torquay and Paignton were visited. Upon reaching Torquay they received a hearty welcome from the corporation. Mr. Councillor Smerdon (three times mayor), acting on behalf of the mayor, who was unavoidably absent, gave a cordial greeting to his brother builders, and wished them a happy day. The corporation hospitably provided four four-in-hand char-a-bancs, in which, accompanied by various members of the corporation, the visitors drove round the borough. Upon their return from the drive, the members of the Bath Association, now joined by several members of the Torquay corporation as their guests, lunched in the large hall at the museum, that being the only room available for the number. After the luncheon, the party went in motor 'buses to Paignton, where they were heartily welcomed by Mr. H. Parnell, the chairman of the Urban District Council, and for an hour or so a number played cricket and bowls in the Queen's Park, which had been placed at their disposal by the council. At 5.20 the party adjourned to the Pavilion, where high tea was served, the president being in the chair. The party started on the return journey at 7.40, and arrived in Bath soon after 12 midnight. The arrangements were made by Messrs. S. Ambrose and E. J. B. Mercer, secretary.

BIRMINGHAM ASSOCIATION.

Secretary: E. J. Bigwood, J.P.

A committee meeting of the Birmingham Building Trades Employers' Association was held at 17 and 19, Colmore Row, Birmingham, on Wednesday, June 23rd. Mr. F. G. Whittall, president of the association, presided, and there were ten other members of the committee present.

Mr. J. J. Moffat reported that he had met the city surveyor and discussed with him the new by-laws of the city council. He pointed out to the committee the alterations from the old by-laws, and was asked to arrange to meet the city surveyor again.

The secretary reported that at the annual meeting of the Local Conciliation Board it was decided that the labourers should be represented on that board. Messrs. A. H. Loud, Guy Sapcote, and G. Percy Trentham were elected to fill the vacancies on the employers' side of the board.

The president was asked to represent the association on the Provisional Committee of the Midland Counties Property Protection Society.

A deputation was appointed to attend the funeral of the late Mr. Thomas Barnsley, J.P., and the following resolution was passed:—"That this committee desire to express to Mrs. Barnsley and family their deep sympathy with them in the great loss they have suffered by the death of Mr. Thomas Barnsley, and their high appreciation of the valuable services Mr. Barnsley has rendered to this association and the trade during the last fifty years."

It was decided to renew for another session the prizes in builders' quantities, carpentry, and joinery, drawing, practical sanitary science, and masonry, at the Municipal Technical School.

Forty new members were elected.

The annual excursion of the association was held on Tuesday, June 29th. The party took train to Droitwich, and then drove through Ombersley to Holt Fleet; lunch was taken at the Holt Fleet Hotel, and the company afterwards journeyed by the steamer "Duchess of York" through Worcester and Upton-on-Severn to Tewkesbury, where dinner was served at the Bell Hotel. The number was not as large as was anticipated, but this was doubtless due to the inclemency of the weather in the early hours of the morning.

BLACKPOOL ASSOCIATION.

Secretary: W. A. Clarke.

As a result of the notice given by the operative joiners for an increase in wages and various alterations in the working rules, and of the counter-notice given by the Master Joiners for a reduction of ½d. per hour and alterations to rules, the matter has come before the Local Conciliation Board, but although four meetings have been held, no agreement could be arrived at, and the dispute has been referred to the Northern Centre Conciliation Board.

HULL ASSOCIATION.

Hon. Secretary: A. Peers.

The annual picnic of the Hull Association took place at Pateley Bridge, when about 90 members and friends formed the party, which left Hull at 7.20 a.m., arriving at Pateley about 10 o'clock. After a hot luncheon at the King's Arms Hotel, the visitors drove in carriages to Howstean Dock, where the afternoon was spent. The drive gave the members the opportunity of viewing the compensation reservoir belonging to the Bradford Corporation, and many diversely interesting objects. At 8.15 p.m. the start was made for Hull, where the party arrived soon after 11 o'clock.

LEIGH AND DISTRICT ASSOCIATION.

Secretary: S. Wigham.

The half-yearly meeting of Leigh and District Association was held at Higson's Restaurant, Market Street, Leigh.

The following were elected members of the association:—Messrs. Langley and Annett, joiners, Atherton; Mr. J. Tildesley, joiner, Atherton; Messrs. Clarke and Mather, joiners, Glazebury; and Mr. G. Moss, joiner, Leigh.

It was decided to adopt the following rule: "(*a*) Any member of this association found infringing any of these rules shall, upon receiving not less than two clear days' notice in writing from the secretary respecting such infringement, appear before the committee and give an explanation of his conduct in respect to such violation of the rules; and should his explanation be deemed unsatisfactory, the committee shall be empowered to fine or otherwise deal with him as they think proper, subject to his right of appeal to a general meeting if he considers he has been unjustly dealt with. (*b*) But should a member refuse to pay a fine, or disobey in any other way the directions of the committee, they may then report him to a general meeting of the association, when he may be expelled by a majority of votes of those present, if due notice of proceeding under this rule has been given on the circular calling the meeting."

LLANDUDNO AND DISTRICT ASSOCIATION.

Secretary: E. P. Morris, Accountant.

On July 22nd the members of the Llandudno Association held their annual excursion, when Llangollen was the venue. A motor char-a-banc left Llandudno at 9 o'clock. Proceeding through Abergely, past Gwyrch Castle (the seat of Lord Dundonald), the party stopped at St. Asaph for refreshments, and then went on past Denbigh to Ruthin, where a further halt was made in order to inspect the new county buildings. The party then proceeded through pretty scenery to Llangollen via Corwen. After luncheon they visited Bryntysilis Church, where there is a tablet recording the fact that Robert Browning worshipped in the church. A start was made for home at 4.30, and Llandudno was reached, via Bettws-y-Coed and Llanrwst, at 9 o'clock p.m., after a most enjoyable ride of 115 miles.

LONDON MASTER BUILDERS' ASSOCIATION.

Secretary: T. Costigan.

An emergency committee meeting of the London Master Builders' Association was held at 31 and 32, Bedford Street, Strand, W.C., on Monday, June 7th, 1909.

The president (Mr. F. G. Rice) was elected to serve as the representative of the association at the conference on taxation of land values, to be held in the Queen's Hall, Langham Place, W., on Tuesday, July 13th next.

The president (Mr. F. G. Rice was elected to serve as the representative of the association on the Home Office Departmental Committee on dangers of white-lead poisoning in house decoration.

The Organisation Committee met on Thursday, June 10th, and also on Thursday, June 17th. Mr. F. Higgs was elected chairman of the committee. Sub-committees were elected, and maps of the district were considered and determined upon.

The Joint Office Premises Committee met on Tuesday, June 15th. Several premises were considered. It was decided to recommend to the council the acceptance of the third floor of the building about to be erected at the corner of Kingsway and Kemble Street.

The Finance Committee met on Thursday, June 17th. The financial statement was submitted and considered, and routine cheques were drawn.

A Council Meeting was held on Thursday, June 17th. Reports from the Emergency Committee, the Organisation Committee, the Office Premises Committee, and Finance Committee were read and approved.

The recommended new offices were unanimously approved by the council. They will be ready for occupation in about twelve months' time.

The visit of master builders from Brussels and Antwerp was reported, and inquiries were ordered to be made connected with it.

SHEFFIELD ASSOCIATION.

Secretary: T. Smith.

The monthly meeting of Sheffield Master Builders' Association was held on June 10th, Mr. W. W. Mears presiding.

Mr. Forsdike reported that the deputation which had waited on the town clerk and city surveyor with reference to the proposed substitution of the city council's ordinary form of contract for small jobs, instead of the short, simple form of contract heretofore in use, had been most favourably received. They had agreed that it was unfair to impose the clause providing for 5 per cent. of the contract price to be retained for 6 months and a further 5 per cent. for 12 months in jobs of this kind, and that all jobs up to £100 in value be settled within 3 months; and it had also been tentatively agreed that jobs of £1,000 value should be settled within 6 months. The deputation had pointed out that it was manifestly impossible for a contractor to be responsible for woodwork done hurriedly for a period of 12 months, as no amount of care could prevent some shrinkage.

A report was given of the meeting with a deputation representing the Builders' Merchants Association with the object of arranging preferential prices to builders. The builders' merchants recognised the fairness of the proposal, and expressed themselves as quite willing to make some concession to builders, but pointed out that there were many difficulties. Unfortunately some builders' merchants were not members of the Merchants' Association, and these would not fall into line, with the result that they would secure the orders of those against whom prices were raised; while, on the other hand, there were builders who were not members of the M.B.A. Beyond this it was a fact that some builders were in the habit of passing the local merchants with their large orders, and using the local merchant merely for odds and ends. If the builders would agree to put their larger orders in the way of the local merchant, there would be a substantial inducement for the merchants to put such rule in force. Again, the deputation contended that there was some difficulty in determining who was a builder, and they could not very well refuse cash with order. Very large users would also buy direct if prices were put up against them. The deputation also held that brick and timber merchants should concede a similar preference. The bankrupt builder financed by another party was also a difficulty, but it was pointed out that in such a case the bankrupt builder, and not his principal, was the person properly entitled to the discount. The matter altogether seemed to bristle with more difficulties than were anticipated, but it was thought that they were by no means insuperable, and the matter was ultimately left over for further discussion by both parties, on the understanding that a start would be made with specific goods, and the preference conceded to members of the M.B.A. only, the main grievance appearing to rest in the system which permitted persons quite outside the building trade to purchase materials at the same prices as builders, and contract for the labour separately.

A report was given of the meeting of the Conciliation Board, and the several matters were discussed at considerable length. Mr. Boot took very strong objection to the way in which his firm had been referred to, and several members expressed the opinion that some apology was due on the part of the operatives.

With respect to the practice of increasing the time on the time sheets when overtime is worked, instead of increasing the rate of pay to time and a quarter, time and a half, or double time, it was held by members that the system kept the rate uniform, and was a great clerical convenience. The wage clerks did not and were not required to take cognisance of overtime, but simply made up wages at one uniform rate for each class of workmen in accordance with the hours shown on the time-sheets, which hours were fixed at the time of working. The system of paying differential rates would lead to complicated entries on the time-sheets and in the wages book, and would doubtless lead to many errors. If a workman receiving 9½d. per hour worked 6 hours on a Sunday, it made no difference whether he was paid for 12 hours at 9½d. or 6 hours at 1s. 7d. The objection of the operatives that the time-sheet might at some subsequent period make it appear that the man had worked overtime at ordinary rates was not tenable, as the time-sheets usually showed the time of commencing and finishing.

With respect to the system of making stoppages from wages to cover the premium for the first week of disablement, the secretary was instructed to ask the operatives to give any specific instances in which the system was in operation.

A report was also given of the meeting of the Trades Committee in reference to the question of proposed abolition of walking time, in lieu of which the operatives had asked for an advance of ½d. per hour, which it was unanimously held could on no account be conceded. The operatives also asked for lodging money at 6d. per night on jobs over 4 miles from Sheffield Parish Church. After a lengthy discussion, the following resolution was unanimously passed, and ordered to be sent to the operatives:—

"That lodging money at the rate of 6d. per night be paid to men sent from the contractor's place of business to work on jobs over 4 miles from the Sheffield Parish Church except in cases where by mutual agreement it is considered advisable that railway and tram fares in and out be paid in lieu of lodging money, conditionally upon the men being on the job at the official starting time, no lodging money to be paid to men set on on the job."

YORK ASSOCIATION.

Secretary: J. Hague, Solicitor.

The general quarterly meeting of the York Master Builders' and Contractors' Association was held at the Old George Hotel, Pavement, on Friday, June 11th, at 8 p.m. Mr. Biscomb presided over a good attendance.

The amended form of sub-contract was read and generally approved, but the question was postponed to a future meeting on its being mentioned that the secretary to the Northern Counties' Federation had been requested by the Yorkshire Federation to prepare a draft form incorporating the provisions of the Workmen's Compensation Act, and also the principles laid down in the suggested form.

On the question of third party risks, correspondence was read from two insurance companies. The members considered that the question was very important, and that adequate cover should be secured against what promised to become a serious liability. After a long discussion, the matter was adjourned until next meeting, in order that further information on various points which had arisen might be obtained.

The executive's recommendation as to the constitution of the Local Conciliation Board for 1909-10 was approved, and election was unanimously passed in accordance with such recommendation. The Chairman reported the result of the recent submission to the Board of a question by the operatives, and explained the present position of the working rules. Correspondence was read with reference to the proposed summer excursion, together with an offer from another association inviting a union with them in an excursion to Edinburgh and Loch Lomond. After discussion, Mr. C. Dent moved that the existing minute on the question be deleted, and that no excursion be held. Mr. G. Rawling seconded, and the motion was carried.

It was reported that since the last meeting the local case that has been previously referred to had been settled, a letter having been received stating that so far as the member was concerned, it was unlikely that any further claim would be made against him personally. The result was considered satisfactory, and it was unanimously resolved that an expression of thanks from the Association should be sent to the Yorkshire and National Federations for their assistance in the matter, which had been much appreciated

Mr. J. W. Belleby was to have moved a question having reference to an addition to accounts rendered, for work done, of a percentage on account of heavy premium for compensation insurance of workmen. In the unavoidable absence of the mover, the Chairman introduced the question to the meeting, and a long discussion followed. Finally, Mr. Lacy moved, Mr. Dodsworth seconded, and it was carried, that the question be adjourned until next meeting, in order to allow of the original mover being present and the question re-opened.

Two questions relative to breach of rules were brought forward, the matter being left to the executive to deal with.

Correspondence was read between the Secretary and the Clerk to the Cemetery Company with reference to an application for a rebate on increase in fees charged for memorials taken into the cemetery by local masons between January 15th and March 31st last. The secretary's action was approved.

New Companies.

BRITISH IMPROVED CONSTRUCTION COMPANY, LTD.—Registered June 26th, by Bircham and Co., 46, Parliament Street, S.W. Capital £100,000, in £1 shares (20,000 Cumulative Preference, 30,000 Ordinary, and 50,000 Deferred). Objects: To adopt an agrement with the Improved Construction Company, Limited, and to carry on the business of manufacturers of bricks, tiles, slabs, pipes, pottery, earthenware, china, terra cotta and ceramic ware of all kinds, manufacturers of and dealers in artificial stone, concrete, and other products, etc.

ROBINSON RENEWABDE TREADS AND CONCRETE COMPANY, LTD.—Registered 25th May. Capital £3,000, in £1 shares. Objects: To acquire the patents of A. R. Robinson relating to an invention for treads to staircases, to develop and turn to account the same, and to carry on the business of manufacturers of and dealers in metallic, wooden and other flooring, roofing and eureka and other concrete, fireproof and iron roofing, paving and stone and marble flooring, etc. Private company. Registered office, New King's Road, Putney Bridge Station, Fulham, S.W.

SIMS AND WOODS, LIMITED.—Registered June 26th, by Law and Worssam, 65a, Holborn Viaduct, E.C. Capital, £4,000, in £1 shares (2,000 six per cent Non-Cumulative Preference). Objects: To take over the business of builders, shop-fitters, contractors, decorators, and plumbers, carried on at 26, Brownlow Mews, Gray's Inn Road, W.C., as Sims and Woods, and to adopt an agreement with J. Sims and A. W. Woods. Private company.

WM. BROWN AND SONS (BUILDERS), LTD.—Registered June 26th by L. W. Wigg, 4, Clement's Inn Lane, W.C. Capital, £3,000, in £1 shares. Objects: To acquire the business carried on at 195, Uxbridge Road, Shepherd's Bush, W., and elsewhere, as Wm. Brown and Sons, and to carry on the business of builders, decorators, contractors, erectors, manufacturers, suppliers and letters on hire of scaffolding, etc. Private company. The first directors (to number not less than two nor more than five) are W. Brown and E. V. H. Brown. Qualification, £250. Registered office, 195, Uxbridge Road, W.

Insurance.

Free £500 Accident Insurance Coupons have been sent to the following:

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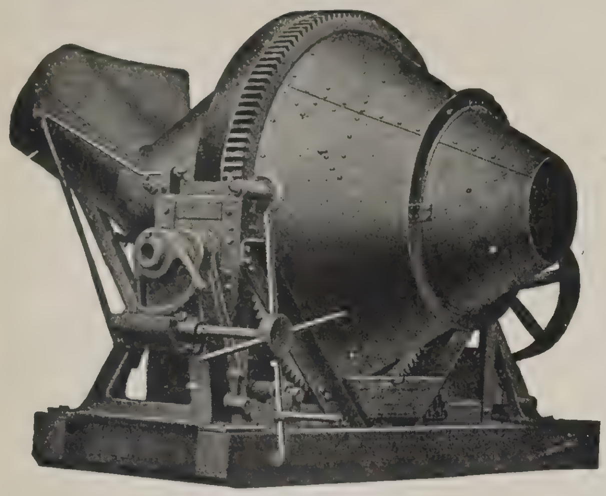

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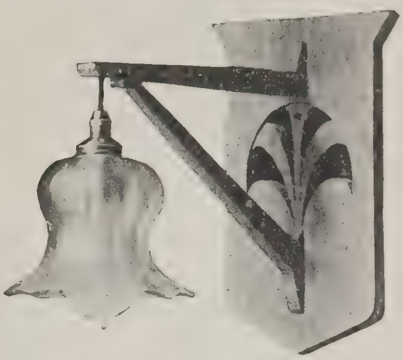

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Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Barry (Wales).—For alterations and additions to Cadoxton Infants' school. for the Education Authority. Mr. G. A. Birkenhead, architect, Caledonian Chambers, St. Mary Street, Cardiff, and Barry:—

	£	s.	d.
W. H. Evans	£2,856	11	7
D. Davis and Sons	2,700	0	0
W. Symonds and Sons	2,652	0	0
Gibby and Cleak	2,648	2	2
H. S. Rendell	2,630	15	8
D. W. Davies and Howell,* Morgan Chambers, Cardiff	2,598	0	0
H. Fisher (withdrawn)	2,309	5	3

*Accepted.

Blairgowrie (Scotland).—For alterations to the High School. Accepted Tenders:—

Ex-Bailie Hill, mason; J. F. M'Ritchie, joiner; G. P. Kidd, plumber; R. T. Craigie, slater; J. Bell, plasterer; J. Burton, painter; J. S. Fraser and Son, heating. Total, about £1,000.

Burslem.—For erection of new Central Schools, Moorland Road, for the Education Committee. Messrs. A. R. Wood and Son, architects, Burslem:—

Contract No. 1.—Elementary Block.

Wilson and Son, Birmingham	£8,370
J. Gallimore, Newcastle	8,219
S. Wilton, Newcastle	8,211
J. Cooke, Post Hill	8,500
T. Godwin, Hanley	7,924
Bennett Bros., Burslem	7,900
W. Cooke, Burslem	7,505
W. Grant and Son, Burslem	7,545
J. Grant,* Cobridge, Stoke-on-Trent	7,503

Contract No. 2.—Manual Training and Cookery.

Wilson and Son	£6,453
J. Gallimore	6,576
W Cooke	6,143
T. Godwin	6,115
S. Wilton	6,055
J. Cooke	5,500
Bennett Bros.	5,900
W. Grant and Son	5,955
J. Grant*	5,585

*Accepted.

Churwell (Yorks.).—Accepted for the various works required in erection of warehouse, etc., Lane Side Mills, Churwell, for Messrs. Charles Scarth and Sons, Ltd. Mr. T. A. Buttery, F.I.A.S., architect, Queen Street, Morley, and 1, Basinghall Square, Leeds:—

	£	s.	d.
W. and H. Sykes, Westfield Road, mason	£1,560	0	0
J. Clegg and Sons, Wesley Street, joiner	896	0	0
J. W. Stakes, Queen Street, plumber	82	10	0
G. Crossley and Son, Victoria Street, Birstall, plasterer	180	0	0
J. Kellett, Fountain Street, slater	159	0	0
J. Bagshaw and Sons, Victoria Foundry, Batley, ironfounder	65	0	0

Rest of Morley.

East Kirkby (Notts.).—For new slaughter-houses. Mr. Walter H. Woods, architect, land and quantity surveyor, High Street, Long Eaton, near Nottingham. Quantities by the architect:—

	£	s.	d.
Tate and Son	£1,389	19	4
Hoole	1,365	0	0
Stubbings and Fell	1,360	0	0
Coleman and Blackburn	1,350	10	0
Messom	1,320	0	0
Evans Bros.	1,305	0	0
Bains,* East Kirkby	1,295	0	0
Wainer	1,255	0	0
Perks and Son	1,249	0	0

*Accepted.

Enfield.—Accepted for erection of a public library, Hertford Road, Enfield Highway, for the Urban District Council. Quantities by Messrs. Young and Brown, 104, High Holborn, W.C.:—

H. Knight and Son, Bruce Grove, Tottenham, N., £3,650.

London.—For repairing, cleaning and painting the interior of SS. James' and Peter's School, Soho. E. R. Robson, F.S.A., architect:—

	£	s.	d.
S. and S. Dunn	£242	0	0
H. and C. Lea	198	0	0
Arthur Daniel	174	0	0
Parkinson and Son	173	0	0
Streek and Co.	168	8	0

(Continued on page viii)

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(Tenders continued from page vi.)

Edinburgh.—For the various works in connection with the New Offices for the United Free Church of Scotland in George Street, Edinburgh. Messrs. Sydney Mitchell and Wilson, architects, 13, Young Street, Edinburgh:—

R. Thornburn and Son, 137, Buccleuch Street, Edinburgh, mason	£10,324	0	0
Wm. Finlayson and Son, Balfour Street, Edinburgh, joiner	4,300	0	0
A. Cunningham and Co., 18, Leith Walk, Edinburgh, glazier	420	0	0
Allan and Sons, 4, George Place, Leith Walk, Edinburgh, tiles and marble	4,131	0	0
Steel and Wilson, 4, Washington Street, Glasgow, plumber	1,080	0	0
G. Rome and Co., 13, Jane Street, Glasgow, plasterer	4,545	0	0
Brand and Son, Arbroath, slater	122	7	5

Holmes Chapel.—Accepted for the erection of "The Hermitage," Holmes Chapel. Messrs. Maxwell and Tuke, architects, 25, Brazennose Street, Manchester:—

Birchall Bros., Middlewich, £416 12s. 7d.

Manton, Rutherlandshire.—Accepted for the erection of a cottage, Manton, Rutlandshire, for Captain E. R. Harbord, D.S.O. J. Frank J. Goodacre, architect, Berridge Street Chambers, Berridge Street, Leicester:—

J. Grocock, Belton £232 4 6

Newbury.—For erection of new offices, for the Town Council. Mr. S. J. L. Vincent, A.M.Inst.C.E., borough surveyor. Quantities by the Borough Surveyor:—

E. A. Bance	£2,678
H. Elms	2,610
A. J. Chivers	2,600
Hoskings Bros.	2,598
Houghton and Hitchman	2,598
G. Elms	2,567
T. Plumb,* Newbury	2,460

*Accepted.

Port Talbot (Wales).—For marking alterations and additions to Gibeon Chapel, Taibach, Port Talbot, for Rev. T. Thomas and Committee. Messrs. Evans and Jones, architects, 5, Station road, Port Talbot:—

M. Cox, Port Talbot	£1,960	0	0
W. P. and E. Williams, Port Talbot	1,717	0	0
J. Davies, Aberavon	1,750	0	0
W. H. Evans, Cardiff	1,762	15	10
D. Davies and Sons, Cardiff	1,640	0	0
J. Nicholas, Port Talbot	1,629	9	9
J. H. Maggs and Co., Cardiff	1,439	0	0
W. Williams,* Pearl Street, Cardiff	1,380	0	0

*Accepted

Portsmouth.—For foundations and buildings to enclose a refuse destructor adjoining the sewage pumping station at Eastney. Mr. C. W. Ball, Q.S.A., surveyor, Whittington Chambers, King's Road, Southsea. Messrs. Heenan and Froude, Ltd., engineers, 4, Chapel Walk, Manchester:—

H. E. Sweetland	£2,100
J. Tanner	1,999
J. Croad	1,949
S. Salter	1,897
J. Crockerell	1,871
Coltherup and Woods,* Portsmouth	1,857

*Accepted.

Rhyl.—Accepted tenders for the construction of Rhyl Pier. Messrs. Maxwell and Tuke, architects, 25, Brazennose Street, Manchester:—

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Swansea.—For additions and alterations to the principal Secondary Boys' School, Dynevor Place, for the Education Committee. Mr. G. E. T. Laurence, A.R.I.B.A., architect, Chandos Chambers, 22, Buckingham Street, Adelphi, W.C. Quantities by Messrs. W. H. Barber and Son, 22, Buckingham Street, Adelphi, W.C.:—

G. Davies	£4,039	5	3
D. Davies	3,752	17	0
Lloyd Bros.	3,603	2	5
H. Billings	3,600	0	0
D. Jenkins, Ltd.	3,566	0	0
Bennett Bros.	3,500	0	0
J. and F. Weaver	3,400	0	0
T Richards,* Swansea	3,150	0	0

*Accepted.

Surbiton.—For erection and completion of extensions to the Electricity Works in Ewell Road, for the Urban District Council. Mr. John Armitage, Sanctuary House, Westminster, architect:—

T. J. Hawkins and Co., Ltd., Westminster	£2,115
J. Casse, Hampton Wick	1,937
S. Kavanagh and Co., Surbiton	1,758
A. M. Coles, Paddington	1,750
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Turtle and Appleton, Clapham Junction	1,580
F. G. Minter, Putney	1,576
Holliday and Greenwood, Brixton	1,569
Patman and Co., Enfield	1,550
J. Carmichael, Wandsworth	1,549
C. F. Kearley, London	1,513
Limpus and Son, Kingston Hill	1,500
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F. and G. Foster, Norwood Junction	1,358
Spencer, Santo and Co., London	1,350
W. J. Fryer and Co., Paddington	1,299
Pasterfield and English,* Streatham	1,266

*Provisionally accepted.

Thornton Heath.—Erection of Beulah Baptist Church. G. Baines and Son, architects, 5, Clement's Inn, Strand, W.C.:—

	Amount of Estimate "A."
Higgs and Hill	£4284
C. Brightman and Son	3,979
Mattock Bros.	3,857
Holliday and Greenwood	3,790
F. G. Minter	3,752
J. and C. Bowyer	3,747
J. Smith and Sons	3,727
Patman and Fotheringham	3,700
Knight and Son	3,679
Lawrence and Son	3,677
Wm. Jerram	3,652
W. Akers and Co.	3,632
Battley, Sons and Holness*	3,587

*Accepted.

Wallasey (Cheshire).—Accepted for erection of a secondary school at Wallasey, for the Cheshire Education Committee.

Huxley, Malpas, £15,430.

Wattstown (Wales).—For erection of a workmen's institute and gymnasium at Wattstown, Rhondda Fach:—

W. Williams, Cardiff Joinery Works, Pearl Street, Cardiff	£3,900
A. Richards, Ton Pentre	2,194
D. D. Isaac, 39, South Street, Tnyshir	2,992
D. Richards, Tnys Villa, Tnyshir	2,600
Evans Bros.,* 32, Woodville Road, Cathays, Cardiff	2,747

*Accepted.

Wrexham.—For school-church, Smithfield, Wrexham, for the Church Extension Committee. Messrs. Prothero, Phillott, and Barnard, architects, 13, Promenade, Cheltenham.

H. A Jones	£1,236
M. Williams	1,022
W. Hughe	1,015
Collins and Godfrey (Tewkesbury)	970
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Lewis Bros.	947
W. E. Samuel,* Wrexham	943

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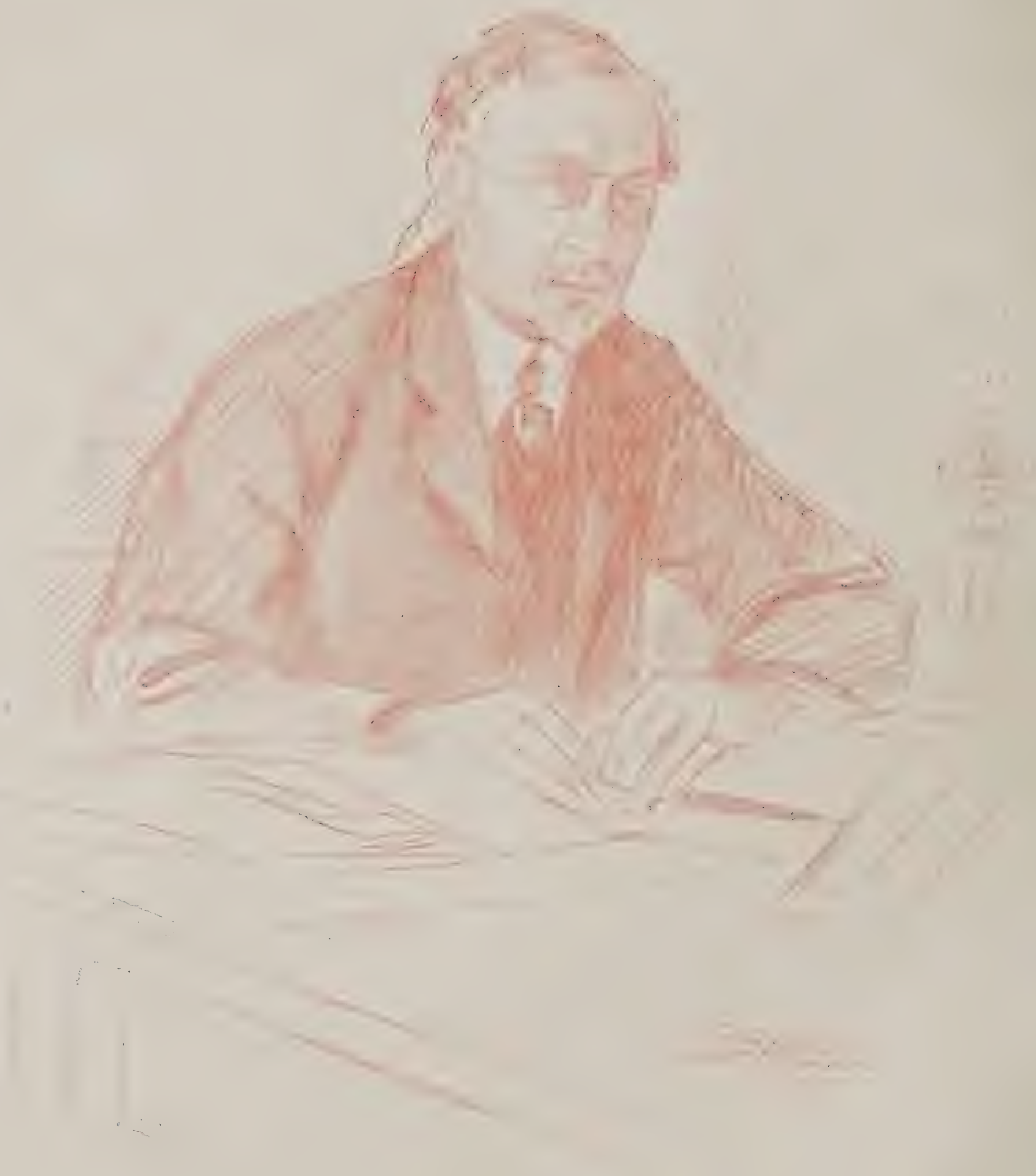

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July 14, 1909. Volume 30. No. 753.

THE BUILDERS' JOURNAL

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Caxton House, Westminster.

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ILLUSTRATIONS.

Mr. Ernest Newton, F.R.I.B.A. (after a Photograph by Messrs. Elliott and Fry), 22; from a sketch by Robert M. Paxton), Supplementary Plate.

Illustrations of some of the work of Mr. Ernest Newton, F.R.I.B.A.: Luckley, Wokingham, 23, 24; Redcourt, Haslemere, 25, 26; Ardenrun Place, Blindley Heath, Surrey, 28 and Centre Plate; Fouracre, Winchfield, Hants; Upton Grey, Hants, 32, 33, 34; Martin's Bank, etc., Bromley, Kent, 35; St. Swithin's Church, Hither Green - - - - - 36
Cottage at Hexham: Edward Cratney, Architect 37
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Architects for the Royal Academy.

The Royal Academy of Arts having been founded in 1768, with Sir Joshua Reynolds as its first President, any complaint that it does not fully justify its comprehensive title, and has never accorded due recognition to the Mistress Art, would probably stimulate architects to no stronger action than "a patient shrug; for sufferance is the badge of all our tribe." We have no intention of raising such an issue. We have the utmost respect for the dignity of the Royal Academy, and any desire to impugn the wisdom of its polity and its practices and pursuits is very remote from our present purpose. We have in view for the moment what is surely a more interesting object, and one that seems to us to be not only entirely void of offence, but to possess a considerable measure of practical utility. It will be granted as being well within the bounds of possibility that the Royal Academy, being a human institution and therefore fallible, cannot and does not invariably select the indubitably most worthy man on whom to confer the honour and dignity of membership or associateship; and that, for rather cogent reasons, its judgments with respect to architects do not always commend themselves to the profession that is most interested in them. Of course, in any case, the elect of the elect is not always, nor perhaps very frequently, coincident with the popular choice. Hence have arisen such significant expressions as "the poets' poet," "the preachers' preacher," "the novelists' novelist;" the form of words suggesting, what is sometimes conspicuously true, that the popular choice of an idol is not necessarily identical with professional preference. In considering these phenomena, it has occurred to us that there is probably in existence, perhaps unsuspecting and unsuspected, "the architects' architect," and we think that it would be, from many points of view, exceedingly interesting to discover his identity. That revelation, however, would be a sort of secondary issue of the scheme that has been suggested to us and that we have decided to put into operation. The primary object of that scheme is to ascertain whom the properly accredited architects themselves would elect if the choice were theirs, and the ultimate aim is by this means to afford guidance which the real Royal Academy electors will no doubt gladly welcome. Accordingly we are putting this issue to the vote. If the interest aroused by this plebiscite is at all commensurate with our own candidly confessed eagerness to ascertain who are the fortunate half-dozen whose work and worth find most favour in the eyes of their professional brethren, and to discover who will head the list as "the architects' architect," the complete success of our plebiscite is assured. We are very earnest in the desire that the opinions thus elicited shall be of practical use to the Royal Academy, and we feel confident that those whom we are inviting to take part in this plebiscite will respond in the same sincere spirit. Full particulars appear on p. 27.

Brentford's Blockade.

There were once upon a time, so runs the legend, two Kings of Brentford reigning contemporaneously and amicably. Has not George Villiers, Duke of Buckingham, celebrated in his "Rehearsal" some of the more dramatic moments in their lovely lives? The habit of congestion seems to have clung to the town; for in the High Street, which is so narrow as to suggest a fleeting doubt as to whether the two kings, neither of whom—they being the politest of monarchs—would have cared to take precedence of the other—could have traversed it abreast. We have been favoured with a copy of the "West London Illustrated Advertiser" (Walter Pearce and Co., St. George's Press, Brentford), in which it is shown, graphically as to the language, and photographically as to the illustrations, that, while High Street, Brentford, is architecturally and in some other respects emphatically an excellent place to get away from, the gratification of that very natural desire is not always so easy and simple of accomplishment as one feels entitled to expect in a civilised country. It is apparent from the pictures that in certain parts of this "main artery from London" there is not room for three vehicles abreast. "It is no uncommon thing," we are informed, "to see the narrow roadway choked with an ever-increasing multitude of commercial drays, traction engines, heavy waggons conveying market garden produce from distant western suburbs to the London markets, continuous streams of electric cars, and innumerable processions of motor cars of every description, all jumbled together in endless confusion, and unable to move in any direction." Five years ago, it is stated, the District Council were seeking powers to widen the High Street, but nothing has been done. Possibly the Council jibbed at the expense, as well they might. At this point, again, the case assumes more than local importance. It is obvious that only a very small proportion of the traffic is purely local. The necessary expansion of painfully constricted "main arteries" should certainly be a national concern. It is iniquitous and absurd to throw on a small town, or even on a large county, the burden of expense involved in forming and maintaining highways that are really national. The Town Planning Bill may remove this injustice; but in the mean time there is likely to be much lamentable delay of vegetable produce in the straits of Brentford High Street; and the many motorists arrested by those traps will be heavily penalised by inability to drive away furiously from the horribly depressing old houses that here and there affront the High Street. That these houses must necessarily be demolished when the High Street is widened is a potent reason for expediting this very necessary improvement.

The Geneva Memorial.

The Calvin Memorial at Geneva, which was unveiled on July 6th, is part of the great memorial to the heroes of the Reformation. The first stone of this great monument has been imbedded in the wall of the rampart built in 1543, which faces the University. The scheme is imbedded in faith, which faces the necessity of raising £24,000 before the monument can be completed. It is not likely that the scheme will either languish or be curtailed for lack of funds; the appeal being international if not worldwide, as the figures that are to be represented on the monument proclaim by their mere names—for instance, Farel, Calvin, Beza, Knox, Cromwell, and Roger Williams. Moreover, at the unveiling ceremony, speeches were delivered by Lord Kinnaird, who is Lord High Commissioner of the Church of Scotland, and by delegates from the Grand Duchy of Baden, Hungary, and Moravia; while the Emperor of Germany contributed a telegram expressing his pleasure at the inclusion of effigies of three of his noble ancestors—Coligny, William of Orange, and Frederick William of Brandenburg. This should loosen the purse-strings in Germany; and on the whole there seems to be no reason for apprehension that the monument will be shorn of its full artistic splendour for lack of "a few rascal counters."

Teutonic Town-Planners. Two hundred members of the German Garden City Association are now visiting this country in order to see what we are doing in the way of practical town planning. Yesterday they were received by the President and Council of the Royal Institute of British Architects, whose hospitality, ever charming, is on this occasion only too obviously disinterested and detached; because the R.I.B.A., as a body, has not been hitherto conspicuous in the van of the town-planning movement. This detachment is not attributed to the R.I.B.A. as a fault. The one other notable occasion on which they have actively manifested their interest in the movement—when they proffered their assistance to Mr. John Burns in relation to his Town Planning Bill—they suffered something that bore at least a distant resemblance to a rebuff that was as ungracious as it was undeserved; and in what other ways they could have demonstrated their interest in town planning would perhaps be difficult to indicate. They are, at any rate, entitled to congratulation on the tactfulness—beyond question free from all taint or suspicion of mere diplomacy in any sinister sense—with which they have seized upon the present occasion to show that they are finely responsive to the amentities of international amity, and that they are at least awake to the importance of town-planning. The visit of our German guests may possibly stimulate the R.I.B.A. to more energetic action in this direction. Our German friends are of course visiting Letchworth; which, equally of course, they, coming of a highly critical race, will not regard as a final solution of the problem, or as a model for all time and all circumstances. They will no doubt admire there the pleasant gables, porches, verandahs, latticed windows, smiling gardens; but they will regret the smallness of some of the rooms, will find fault with some rather inconvenient planning, and will wish the inhabitants a double portion of Teutonic patience with which to await the growth of the forty-five thousand trees that have been planted, and pending whose maturity, as well as the addition of many more buildings, the first Garden City must wear that general air of incipiency which is so fatal to serenity and comeliness. They will probably think that, as the Cockney is wont to say of London, which, by the way, will show our visitors that it has never quite thrown off all traces of its former glories as a vast Garden City—Letchworth "will be a fine place when it is finished."

Dignity at a Discount. With the holidays upon us, it is perhaps a not unseasonable remark that it is not always possible to say offhand whether the tide is coming in or going out. What of those art waves of which we have recently heard so much? Down Torquay way, there is some slight indication that there is at any rate a considerable stretch of rather arid sand, and a goodish bit of very stony beach, on the foreshore. Torquay, it seems, is "still coquetting with its scheme for erecting municipal buildings and a pavilion," and it is strongly urged by a writer in a Devonshire paper not to be like the wave that wavereth, but to "make a strenuous bid for popularity with holiday keepers from all parts of the country." Yet the writer who advises this heroic course appends an admonition that raises in our mind the floating doubt indicated in our opening sentence. "Money," he declares, very candidly, but somewhat hortatorily, "should not be spent on luxuries, or merely to enhance municipal dignity, but no reasonable expense ought to be spared on projects likely to enhance the attractiveness of the town." If what will enhance municipal dignity will not also enhance the attractions of the town, so that the council would be wordly-wise in throwing dignity to the dogs, and in putting up some horrific structure that should shriek aloud for the suffrages of the many-headed mob, with a frank "Philistia, be thou glad of me!" why, chaos is come again; for if dignity is so belittled in genteel Torquay, what ragged remnant of hope is left for vulgar—— The blank may be filled in in accordance with individual preference—one dare not say taste.

Decorations and other Orations. Master house-painters and decorators are an enterprising band, and are sociable and clubbable withal. The London Association of Master Decorators have held their first annual meeting, and have achieved their first annual dinner; while the National Association of Master House Painters and Decorators of England and Wales are busy in preparation for their annual convention, which is this year to be held in Sheffield, in September, and includes an exhibition, which is to be formally declared open by Sir William Richmond, R.A., who also has promised to deliver a lecture on some phase of decorative art; while the Worshipful Master of the ancient City Company of Painter Stainers will be present at the annual dinner, when, if (as seems antecedently improbable) he holds with the poet that "the form, the form alone is eloquent," he will find that there is a good deal to be said in favour of colour, and that the decorators are capable of saying it with a degree of oratorical fervour that justifies our heading. High art, indeed, as Sir William Richmond will allow, is not incompatible with the use of a long ladder or a Palmer's cradle; and, speaking of cradles, one is reminded that the National Association is fostering an excellent nursery of decorative art. It is offering this year nearly £90 in prizes for the work of apprentices, and will inaugurate a prize scheme for young men, who, being out of their apprenticeship, but not more than twenty-five years old, may compete for valuable prizes and scholarships. The Association has also established travelling scholarships, the winners of which go to Italy to study the masterpieces of decorative art. Perhaps it is not incompatible with these high and noble aspirations that the Association does not, apparently, disdain to encourage the curious art of marbling; which, if 'tis done, 'twere well 'twere done quickly—and as artistically as may be; although it is at best a form of decoration that is of doubtful decorum.

NATIONAL FEDERATION OF BUILDING TRADE EMPLOYERS.

As announced in previous issues, the half-yearly meetings of the National Federation are to be held next week at Portsmouth. On Tuesday, July 20, the Council meeting will be held; and on the next day (Wednesday) at 10.30 a.m., the general meeting is to be held in the Grand Jury Room at the Town Hall. Reports of the proceedings will be published in due course.

Architects of the Day.

II.—Mr. Ernest Newton, F.R.I.B.A.

Though our modern public and civic architecture cannot in the main vie with that of our near neighbours the French, or our cousins, three thousand miles removed, the Americans, yet the fame of our domestic work has spread into all lands, and it is particularly appropriate therefore to devote an early article in this series to the work of so talented an exponent of domestic architecture as Mr. Ernest Newton. To his work and to that of some of his immediate friends and contemporaries we owe a renaissance in English house architecture that is the object of study and admiration among the continental nations. Such painstaking and monumental works as "Das Englische Haus," by Herr Muthesius, bear witness to the interest which our English dwelling excites in German art circles.

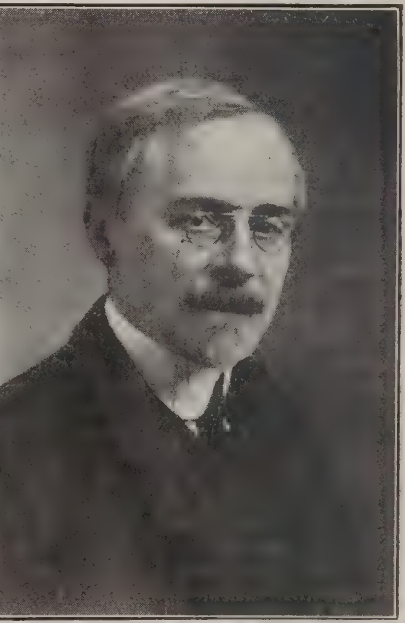


Photo: Elliott & Fry.

MR. ERNEST NEWTON, F.R.I.B.A.

Commencing with a few formal particulars, we may mention that Mr. Newton was born in London in 1856, and was educated at a preparatory school at Blackheath, afterwards proceeding to Uppingham, which famous old public school he left in 1872. In the following year he was articled for three years to Mr. Norman Shaw, R.A., and at the conclusion of his term stayed with Mr. Shaw for a further three years, after which he commenced to practice on his own account. Mr. Newton has been particularly identified with movements tending to the better education of architects and the public. In his early years of practice he was a member of the Architectural Illustration Society, which, for its ultimate object, was designed to raise the standard of work selected for illustration in the technical papers. At that time Mr. Newton tells us the building papers published most things sent up to them, without very much regard to artistic merit in the buildings depicted. The modus operandi of the Society was to invite illustrations of good work from various architects, and under the imprimatur of the Society to publish them as plates in one of our contemporaries. The arrangement continued in force for some years, and was not without its educational effect, both on architects and editors.

Mr. Newton was also closely identified with the formation of the Art Workers' Guild, which began in quite a small way in the early eighties. It grew out of a small society known as the St. George's Art Society, and was originally limited to architects, the meetings being held in Mr. Newton's offices, then situated in Hart Street, Bloomsbury. Later on followers of other arts and crafts were admitted, and now it is a flourishing society, with headquarters at Clifford's Inn Hall, has celebrated its half-jubilee, and has promising offspring in the shape of a junior guild.

In more recent years Mr. Newton became a member of the Honorary Editorial Committee of "The Architectural Review," and, probably no magazine has ever been produced under more influential or authoritative direction. A committee which included, beside Mr. Newton, such architects as Mr. Norman Shaw, Mr. John Belcher, Professor Reginald Blomfield, Mr. Mervyn Macartney, Mr. Halsey Ricardo, Mr. Edward S. Prior, and, for literary direction, Mr. D. S. MacColl, now keeper of the Tate Gallery, was destined to create interest and command attention in even the limited fields of architectural journalism; and, as one who was privileged to assist the committee in its deliberations, the writer can testify to the pleasure and value of those round-table lunches at the Savoy, for the meetings of the committee were planned on the model of the well-known "Punch" staff dinners. It is difficult of course to estimate the exact effect of the committee's work at this date, but we are inclined to credit to it a considerable share of the awakening public interest in matters architectural; and in the domain of architecture there is little doubt that the very considerable attention bestowed by the committee on the subject was instrumental in leading to the present forward movement in architectural education.

Mr. Newton's windows in Raymond Buildings look out over that beautiful expanse of green grass and trees that the Honourable Society of Gray's Inn so creditably preserve; and while, on a recent June morning, our artist waited for sufficient light, we admired the prospect and discussed a number of subjects with Mr. Newton of more or less topical importance.

The establishment of a Ministry of Fine Arts has long been a subject of interest to architects, and very divided views are held upon the subject. Remembering how strongly the "Review" editorial committee had advocated the appointment of a Minister of Fine Arts, we ventured a question on this topic. Mr. Newton was favourable—"provided," he added, "that such a minister was assisted by a committee of competent architects, painters, and sculptors."

Though architectural education has of late developed amazingly, Mr. Newton feels that it is not quite definite enough or long enough. "We want something big to work up to: something more advanced and on the Beaux Arts lines. Though our students are 'tremendously strenuous,' they too soon drift into practice." He thought the Beaux Arts system of pupils attaching themselves to the very big men was a good one; the prestige of these men and the veneration in which they were held by their pupils was quite remarkable. "I am afraid," added Mr. Newton, drily, "that our big men over here do not for many reasons appear such heroes to their pupils." Of the merits of a previous University education Mr. Newton was not so certain. He felt that the University man, if he has already earned distinction at the University, might find it difficult to begin again with the A B C of architecture, and it is not easy to devise a scheme of education by which architecture can be so presented to him as to make him enthusiastic and carry him through the drudgery of the early stages.

On the question of competitions, Mr. Newton had a good deal to say. "I doubt if all competitions should be open. They should be for buildings up to—say— £20,000, but for the bigger ones, invitation is better in my opinion; and I would even go so far as to give commissions for many big buildings without any competition. My idea is that the young man would get his chance with the smaller buildings up to £20,000. If he makes his mark he gets into the invited class, and if he is successful here he has the opportunity, when mature, of doing a big thing without competing. As things are now the young man gets buildings that are really too big for his experience. I admit a few exceptions, of course. But, by the time he has made his reputation and—shall we say—ripened, he is practically shelved, as no one in that position will, or can, waste his time in open competitions. The result is, speaking generally, that the biggest buildings are not done by the biggest men. I will admit that the biggest men are not necessarily the best, but if they worked their way into their positions, as I suggest, I think they would usually be found worthy of their eminent position."

The subject of competitions is, in Mr. Newton's view, more or less bound up with that of registration, to which topic we naturally alluded. Mr. Newton thinks that the "competition mania," as he terms it, has done much to lower the status of the architect. Public bodies institute competitions among architects in much the same way as they invite tenders for the supply of bread and potatoes. On the other hand, if a painter or sculptor is to be employed, he is generally commissioned direct, and a mature man with a reputation is selected. In his opinion the professional status of the architect is fully defined; what is needed is the recognition of architecture as an art, and of architects as artists. This can only be achieved by doing good work, and Mr. Newton believes that good work "in bulk" has only been done comparatively recently. He cites the illustrations given in the professional journals of thirty and forty years ago as evidence of the fact. Though he does not suggest that good work was unknown forty years, ago, it was small in quantity compared with the mass of undistinguished work that was current architecture then.

Mr. Newton holds strong views—views that are pretty generally shared by his brother architects—on the land taxation proposals in the present Budget. There is no doubt that these proposals, coming on the top of the

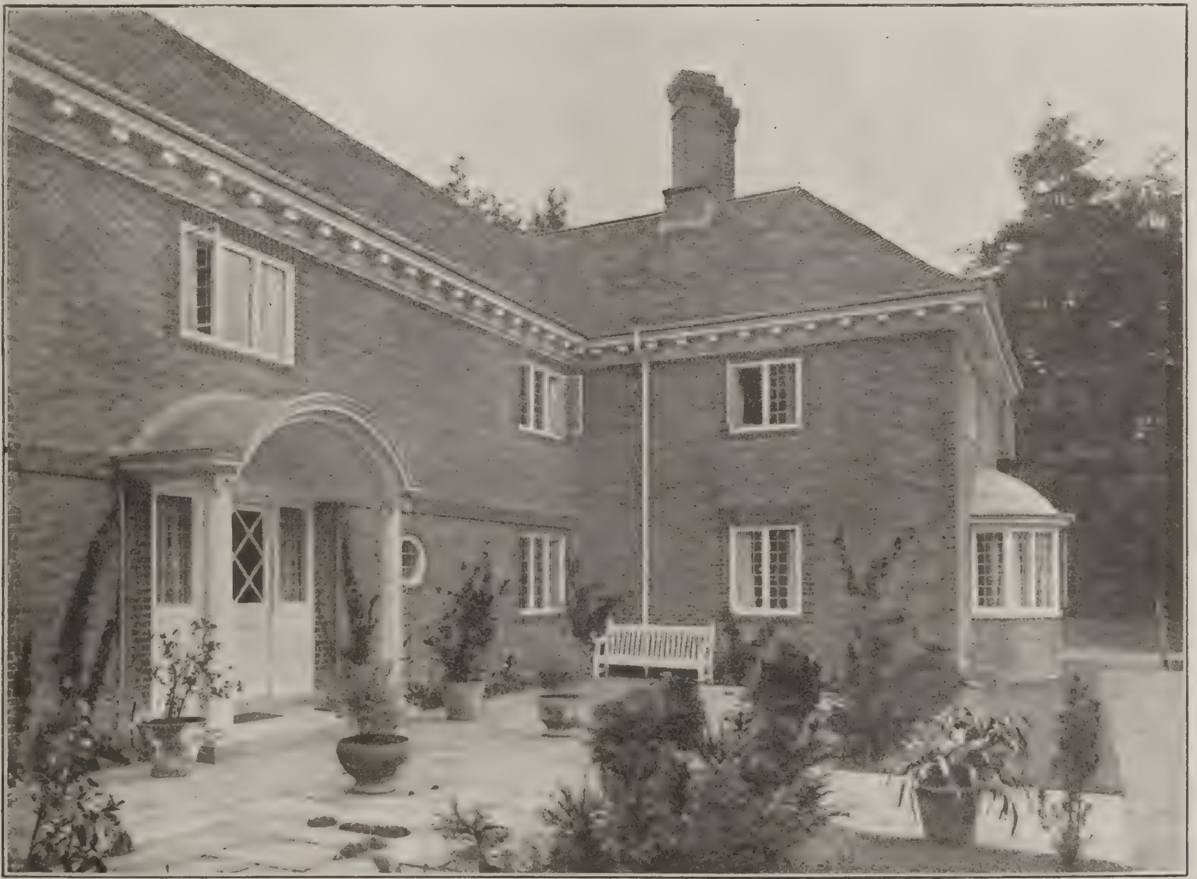
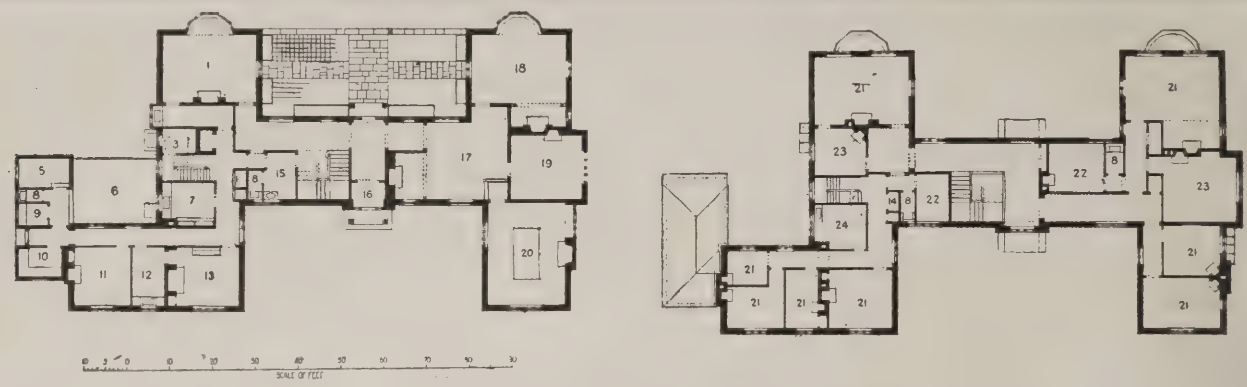


Photo: T. Lewis.

LUCKLEY, WOKINGHAM, BERKSHIRE. THE ENTRANCE AND FORECOURT. ERNEST NEWTON, F.R.I.B.A.

This house is situated on the site of an old house in well-wooded country, a mile south of Wokingham. The walls are faced with Sussex clamp bricks with Wrotham bricks as dressings. The roofs are covered with dark, hand-made Wrotham tiles.



LUCKLEY, WOKINGHAM, BERKSHIRE. GROUND AND FIRST FLOOR PLANS. ERNEST NEWTON, F.R.I.B.A., ARCHITECT.

1. Dining room. 3. Store. 5. Coal. 6. Yard. 7. Pantry. 8. W.C. 9. Knives and boots. 10. Larder. 11. Servants' Hall. 12. Scullery. 13. Kitchen. 15. Lavatory. 16. Entrance lobby. 17. Hall. 18. Drawing room. 19. Study. 20. Billiard room. 21. Bedroom 22. Bathroom. 23. Dressing room. 24. H.M.C.

long continued depression in the building trade, are calculated to affect architects and builders severely, and have, in fact, already had that effect, as numerous reports we have received testify. The proposal to make "the rich people poorer," is not one that architects can endorse, since, as Mr. Newton, points out, architects must be employed by rich people or by the State; and the State has not yet given any sign of its intention to act the part of a fairy godmother. An architect, like Mr. Newton, whose practice is so largely concerned with the better class of domestic work, must be directly affected by these proposals, and Mr. Newton fears that the passing of the Finance Act will probably prohibit the erection of the smaller country mansion, costing from £10,000 to £15,000, and with the disappearance of this class of house will vanish much of that quiet country life for which England, in the past, has been famous.

Asked for a list of his principal works, Mr. Newton demurred to such a formidable request, but kindly furnished, to use his own word, a list of "samples." This includes Buller's Wood, Chislehurst; Redcourt, Haslemere; Glebelands, Wokingham; Steep Hill, Jersey; house at Ewhurst; Dawn House, Winchester; Ardenrun Place, Surrey; St. Swithin's Church, Hither Green; chapel, House of Retreat, Clerkenwell; tower and spire, St. George's Church, Bickley and Martin's Bank, Bromley. Of the last- named charming little street front Mr. Newton has, in the course of his walks abroad, met with at least two close copies, a flattering but by no means gratifying distinction.

In the bare recital of these various facts and opinions we have not been able to give instances of the dry and sprightly wit which Mr. Newton exercises, too often at his own expense. He is a charming conversationalist and those who know him well will bear us out in saying that a chat with him carries pleasant memories and unfailing delight.

LONDON MASTER DECORATORS.

The London Association of Master Decorators have held their first annual general meeting at the Holborn Restaurant, when a large number of members were present. The president, Mr. H. A. Campbell, made some interesting statements as to the useful work done by the association during the first year of its existence, and dealt at considerable length with the work which it has in hand for the current year. The following office bearers were re-elected:—President, Mr. H. A. Campbell; vice-president, Mr. John Anderson; treasurer, Mr. J. J. Honeychurch. The first annual dinner of the association was held under the presidency of Mr. H. A. Campbell, at the Holborn Restaurant, on Thursday, June 10th, when about 50 members and a few friends were present. Amongst the guests were Mr. J. D. Crace, president of the Incorporated Institute of British Decorators; Mr. J. Puttrell, president, and Mr. W. G. Sutherland.

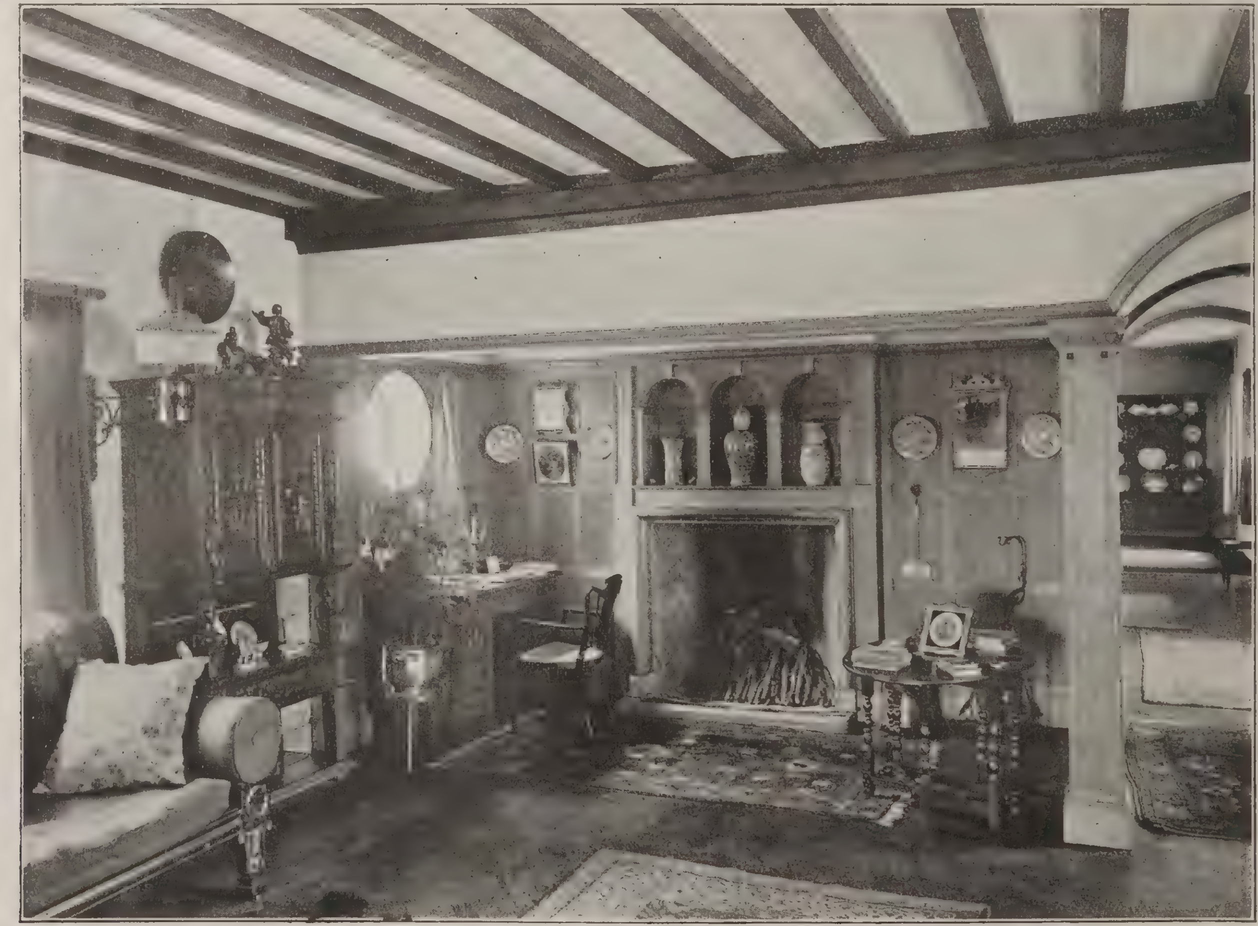


Photo: Architectural Review Photo Bureau.

LUCKLEY, WOKINGHAM, BERKSHIRE. THE HALL. ERNEST NEWTON, F.R.I.B.A., ARCHITECT.

The walls are panelled in oak and the beams are exposed. The floor is paved with jarrah-wood blocks.

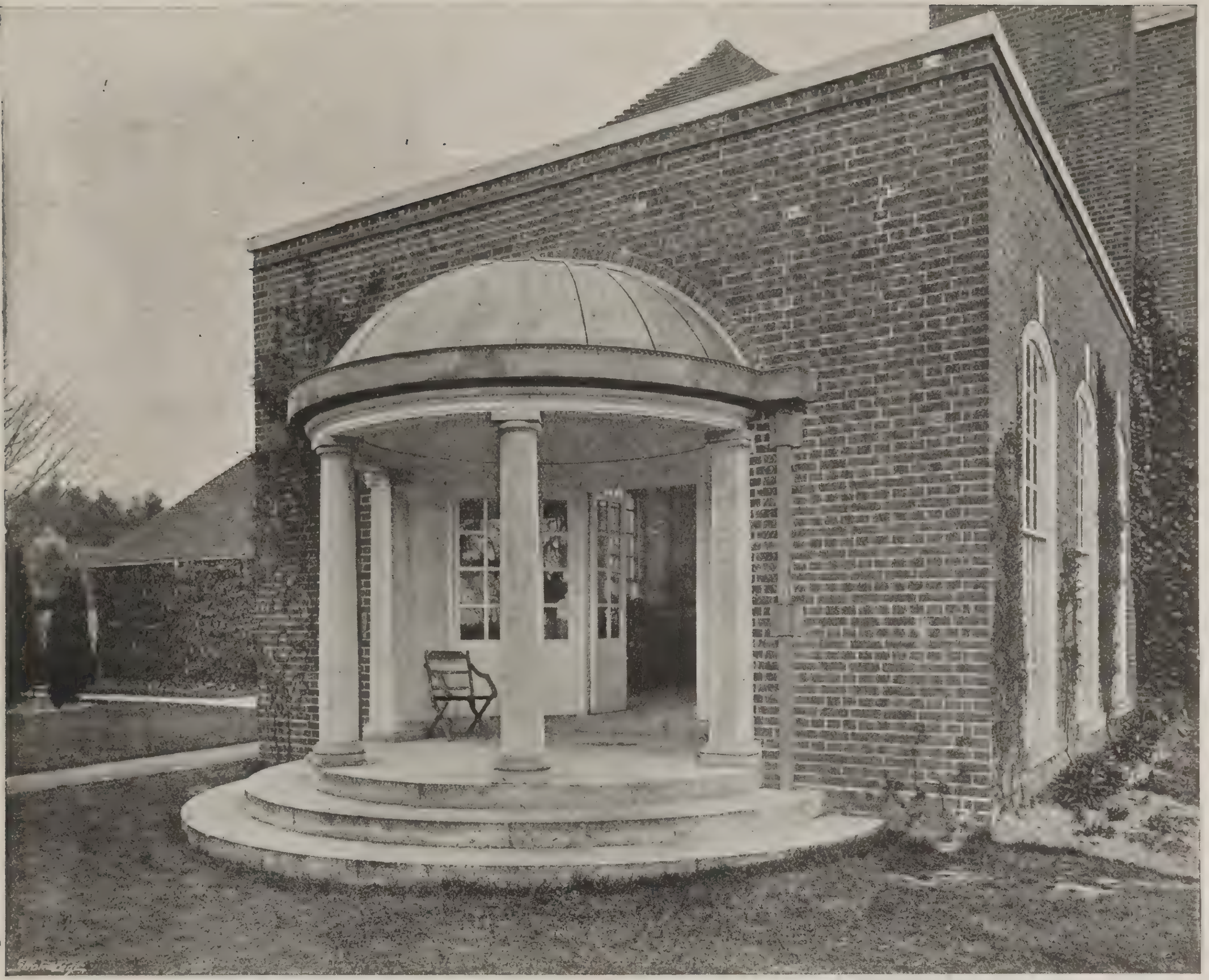


Photo: Architectural Review Photo Bureau.

REDCOURT, HASLEMERE. LOGGIA TO WINTER GARDEN. ERNEST NEWTON, F.R.I.B.A. ARCHITECT.

This is a very delicate and characteristic piece of Mr. Newton's work. The house is built of red Wrotham bricks and roofed with red Wrotham hand-made tiles. The stone is Portland. The gutter and down-pipe are of cast lead.

Notes and News.

The junction of the Boulevard Haussmann, one of the finest thoroughfares in the French capital, with the main system of boulevards has been brought nearer by the decision of the Municipal Council to acquire a block of buildings in the Rue Taitbout. These buildings are to be pulled down when the various leases expire at the end of the next two or three years, and the Boulevard Haussmann will thus be carried all the way through to the Rue Laffitte, across which it is ultimately to be linked up with the Boulevard des Italiens. Some of the ground now acquired will be available for building sites, the enhanced value of which will enable the Council to reimburse itself in large part for the cost of acquiring the existing block of buildings. The Place du Carrousel in the Tuileries Gardens, which had for many months been boarded up with unsightly wooden pailings, is once more open to the public view. The new ornamental flower beds and lawns with which the space between the Pavillon de Rohan and the Pavillon de Lesdiguières has been laid out considerably add to the amenity of this part of the grounds.

* * *

Mr. Lloyd George has received a deputation from the Garden City Association, which placed before him the points on which it was thought that the Budget would affect garden city schemes. One of the points urged was that land which was not built upon in accordance with the settled plan of development should not be treated as undeveloped land for the purposes of the tax, although no buildings are erected upon it. Another suggestion the Chancellor of the Exchequer was asked to consider was that every provision should be made to ensure that the carrying out of a town-planning scheme should not entail loss by the owner consequent on his leaving the land unbuilt upon. Mr. Lloyd George replied to the deputation, but his reply is to be regarded as confidential.

* * *

We are informed that Nicholas, Denyer and Co., 43, Pall Mall, S.W., have just sold nearly four acres of freehold building land adjoining Rickmansworth Park, this being the only lot left over from their auction sale held at Rickmansworth on June 26th.

* * *

The famous old farmhouse at Kirkton, Fraserurgh, which figured prominently during the Jacobite rebellion, is being demolished to permit of the extension of Fraserburgh Cemetery.

* * *

In the House of Commons, Mr. Sloan having asked the Chancellor of the Exchequer whether the proposed central road authority referred to in the Finance Bill is to be a Crown nominated board or a popularly elected one, and when he proposed to bring it into existence, Mr. Lloyd George (Chancellor of the Exchequer) in reply says: I hope that a Bill embodying the proposals in connection with roads which I laid before the House in my Budget speech will shortly be introduced, but until this is done it would perhaps be premature to answer the question put by the hon. member.

Owing to its bearing no identification inscription, probably few of the many thousands who daily passed the equestrian statue of George IV. in Trafalgar Square have known whom it represented. The Office of Works has just caused this omission to be rectified, and the words "King George IV." have been inscribed in gilt lettering on the Aberdeen granite pedestal, together with the name of the sculptor (Sir Francis Chantrey). This statue, which represents the King wearing a wreath of laurel, and riding his charger without stirrups, had a somewhat curious origin. It was ordered by King George himself, and was commenced in 1829, the price agreed upon being 9,000 guineas. The King paid the first instalment in the following year, and the last was paid by the Lords of the Treasury in 1843, after the death of both King and sculptor. The original intention of King George was to have the statue mounted on the Marble Arch, which then stood in front of the main entrance of Buckingham Palace.

* * *

"Inside Facts about Saxon Portland Cement," a neat and useful booklet, which we have previously noticed, now appears in a second edition. The booklet includes a most interesting account of the processes of manufacture, with illustrations of the firm's premises and plant, and of some important works on which their cement has been or is being used. The firm have also issued a separate list of such works, in which it is shown that among the most extensive users are the Admiralty, the War Office, H.M. Office of Works, the General Post Office, the London County Council, and a large number of corporations, railway companies, tramway and waterworks companies, and other public undertakings; and that it is employed in the construction of innumerable churches, schools, theatres, etc. These publications are to be had from the Saxon Portland Cement Co., Ltd., Cambridge.

* * *

The effect of arches as an addition to street architecture could be fairly well judged from the erections which were placed across the roadways during the recent Royal processions at Birmingham and elsewhere. A correspondent of the "Birmingham Post" points out that while collectively a very large amount of money is spent on such objects, artistically the result achieved is unfortunately very small. For this money a permanent memorial of the visit could have been erected in the form of an arch, useful, and a work of art at the same time. This is a matter that the authorities should have at heart: it would at once appeal to our neighbours abroad as an important part of city improvement schemes and town planning. Years ago, he says, in one of the original plans for the Birmingham Council House buildings, a suggestion was made for providing an archway and bridge connecting the angle of the Town Hall. By this means corporation and other Government offices have before now been brought into touch with one another. The idea, if allowed to grow, would make a square in reality of Victoria Square, or at lease an enclosure with some title to the name. In the new Art Gallery extension, Birmingham will soon have a bridge and arch to serve a useful purpose; its position is not sufficiently central or important, but it may tend to lead the way to others. Our cities are sadly lacking in enterprise of this kind. It does not appear to be always a question of funds; it is more a matter of getting the best and most permanent value for the money actually expended. One can only regret this opportunity as one of wasted effort.

* * *

The building trade in the East Northumberland districts appears to be on the eve of a welcome boom. At Blyth, where house accommodation has become very scarce, and rents are being raised, plans for extensive developments have been passed by the public authority. The enterprise of Lord Ridley promises to result in the erection of a large number of houses between Newsham Railway Station and the Links. At New Delaval house are going up rapidly to meet the local demand, and the same remark applies to the Bedlington district, where important mining extensions are in progress. Plans for over 300 houses at Woodhorn have been approved by the Morpeth Rural Council, and in the Hirst locality extra accommodation continues to be provided. After the lengthy period of practical stagnation in this district as elsewhere, a spell of building activity is decidedly a gratifying change.

* * *

Lord Strathcona has presented to the McGill University, Montreal, of which he is chancellor, £100,000, of which sum four-fifths will be needed for the completion and equipment of the new Medical Buildings, the old having been destroyed by fire in 1907. The remainder is intended for augmenting the salaries of the University staff.

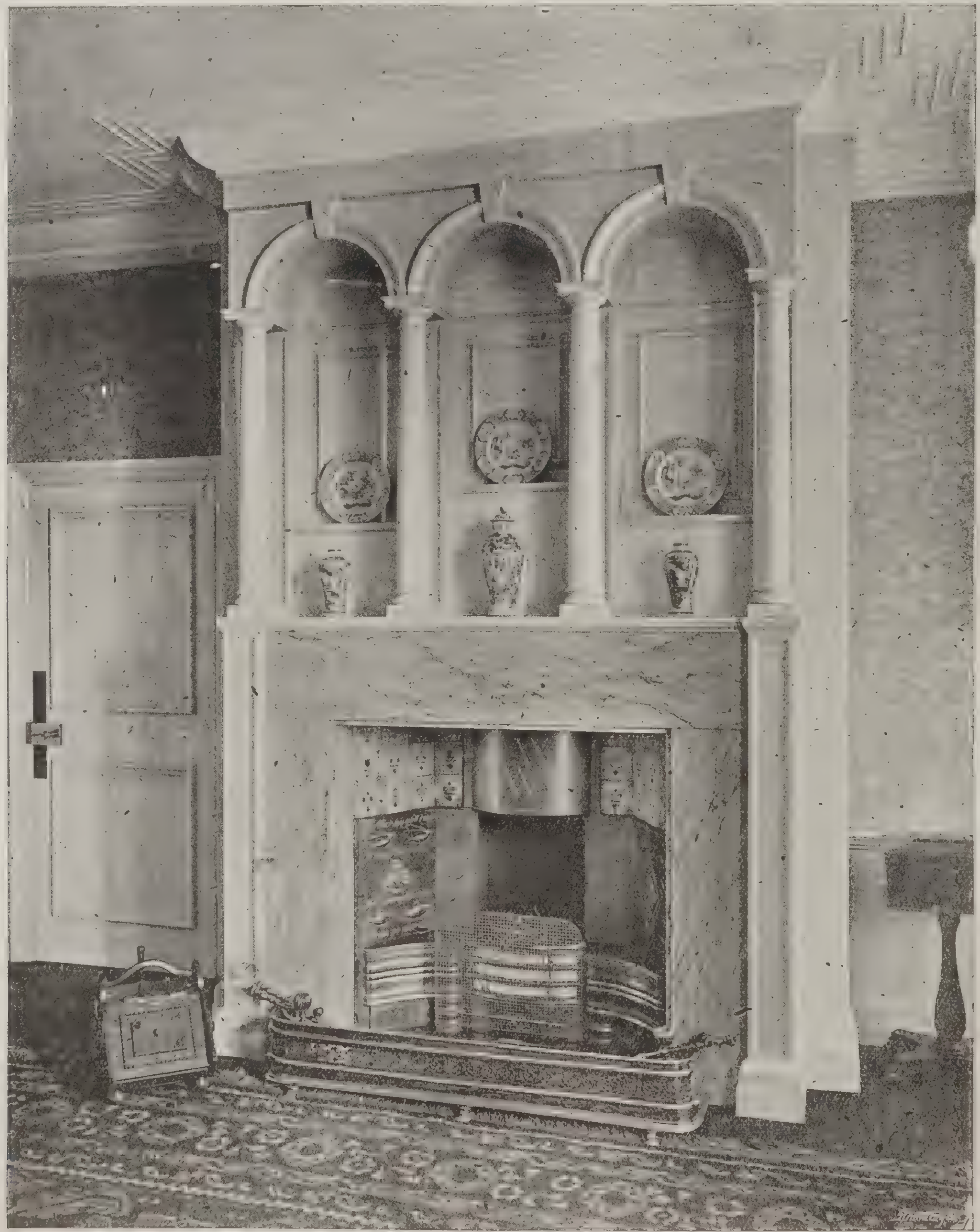


Photo: Architectural Review Photo Bureau.

REDCOURT, HASLEMERE. DINING-ROOM CHIMNEY PIECE. ERNEST NEWTON, F.R.I.B.A., ARCHITECT.

This chimney piece is also a very characteristic example of Mr. Newton's work. The treatment of three arches on supporting columns, or pilasters forming niches, occurs in other buildings of his, as at Luckley on page 24.

The loss of life by the caving in of a trench at the Newport Dock Extension works is reported at thirty-nine, although exact ascertainment seems hardly possible. A theory that the accident may have been of seismic origin is supported by the statement that at the moment of the accident an earth tremor was registered on an instrument in a shop in Newport; but it seems to be a fair inference that the collapse of the trench, from whatever cause, may itself have set up the record.

In Parliament.

By our Gallery Representative.

The Queen Victoria Memorial.

Mr. Harcourt, the First Commissioner of Works, informed Major Anstruther-Gray in the House of Commons last week, that the work upon the Queen Victoria Memorial was proceeding, but he could not fix a date for its completion. That must depend upon the progress made. The fountains were already open to view.

The Mall Archway.

Major Anstruther-Gray inquired whether the First Commissioner could state when the archway on the east of the Mall leading into Charing Cross would be open for traffic.

Mr. Harcourt said the contract provided for the completion of the building at Christmas of this year, and he hoped to be able to open the arches shortly after the date, but the possibilities of traffic depended upon the action of the London County Council on the roadway beyond the limits of the Park and the new building.

New Shelter and Fountain in Kensington Gardens.

Mr. Stianger having asked the purpose of the octagonal building which is being erected in the north-west corner of Kensington Gardens,

Mr. Harcourt informed him that it had been erected by the generosity of a lady who did not wish her name to be divulged, in order to provide a shelter and drinking fountain, surmounted by a clock, for the use of the children who frequented Kensington Gardens. Another anonymous donor had been equally kind in providing swings and other equipment necessary for the formation of a playground for children immediately around the fountain. The fountain, which had been most carefully designed to harmonise in every essential with its surroundings, would, he anticipated, prove not only an addition to the appearance of that portion of the gardens, but also the greatest boon to the numerous children.

Portsmouth Lock.

Mr. McKenna, the First Lord of the Admiralty, informed Mr. Ashley that various schemes for the new lock at Portsmouth were prepared, and on July 16th, 1907, it was decided to adopt the scheme which was now being carried out. The first vote for its construction was taken in 1906-7, when the sum of £10,000 was provided. The estimated total cost of the lock and the connected works was £940,000, exclusive of £65 000 for machinery. The main contract was due for completion in the autumn of 1912.

Building of Technical Schools in Ireland.

Mr. Birrell, Chief Secretary for Ireland, replying to Mr. Flynn, stated that he at present saw no prospect of providing additional grants for the building of technical schools in Ireland.

The Aldersgate Street Post Office.

Mr. Tyson Wilson asked the Secretary of State for the Home Department if he could state how many fatal and non-fatal accidents had happened on the new post office in Aldersgate Street since the commencement of the work up to the present time.

Mr. Gladstone said: It has not been possible to ascertain by a search through the records of the department how many reportable accidents have occurred during the 2½ years the works have been in progress, but the accidents entered in the register kept at the works are as follow: 1 fatal, 6 serious, 36 slight

Architects for the Royal Academy: "Builders' Journal" Plebiscite.

It is common knowledge that the elections of architects to the Royal Academy have often, whatever may have been the merits of the candidates selected, by no means represented the consensus of opinion among their brother architects.

It has often occurred to us, and our view is confirmed by conversation with painter and sculptor members of the Royal Academy, that votes are sometimes given for or against architects without much previous knowledge either of the candidate's work or of his professional standing; a fact that is not surprising when we remember the painters and sculptors number 64 (as against six architects!). It is evident that the electoral power is entirely in the hands of those who can have but little real knowledge of architects. The architect R.A.'s are Messrs. George Aitchison, T. G. Jackson, Norman Shaw, and Sir Aston Webb, C.B.; Mr. John Belcher is R.A. elect; and Mr. Reginald Blomfield is A.R.A.

We have reason to believe that an expression of opinion by those qualified to judge would be welcomed by many members of the R.A. as a guide to them in their selection of representatives of the art of architecture. This plebiscite should serve an excellent practical purpose by designating in the most definite manner possible the architects who, in the opinion of accredited members of the profession, are worthy of the signal honour of election to the Royal Academy. The painters and sculptors of the Royal Academy will no doubt be grateful for such guidance, which should also greatly strengthen the hands of the architect members.

We therefore invite our readers to fill in one of the postcards which will be issued by the "Builders' Journal." The postcards must be legibly signed, and the replies of those voting will be submitted to the scrutiny of two architects of position entirely independent of this Journal, namely, Mr. A. W. S. Cross, M.A., V.P.R.I.B.A., and Mr. E. A. Rickards, F.R.I.B.A.

It is intended that bona-fide qualified architects only shall form the electorate. Voters must therefore be:—

1. Fellows or Associates of the R.I.B.A.
2. Fellows or full members of Societies allied to the R.I.B.A., but who are not necessarily members of the R.I.B.A.

As, owing to the elevation of Mr. Belcher to full R.A. honours, there is at present a vacancy for an architect "Associate," the voting is of immediate practical interest to the profession.

The decision of the scrutineers as to the admissibility of a vote is final.

The twenty names receiving the largest number of votes in the first ballot will be issued for a second vote, and the six that stand highest on the second list will be again issued for final voting. Only those who have voted in the first round will be allowed to take part in the second and third rounds. The plebiscite thus follows the method of voting adopted in the Royal Academy elections. The third and final ballot, taken on the three or four names placed at the head of the list by the voting in the second round, will decide the contest, and show who, in the opinion of the profession, is most worthy of election to the Royal Academy.

All votes will be regarded as absolutely confidential, and the voting cards will be destroyed directly the scrutineers have reported the result of the voting to the Editor.

The results of the successive ballots will be announced in this journal as soon as possible after they have been ascertained by the scrutineers.

Postcards inviting votes for the first ballot were posted to the above-mentioned electorate yesterday.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
July 17	NEW PUBLIC BUILDINGS, BURSLEM. The Architect whose design is placed first by the Assessor will be appointed to carry out the work. Premiums of £100 and £75 to authors of second and third designs, respectively, Conditions and plan of site from F. Bettany, Borough Surveyor. Deposit, £2 2s., returnable on receipt of *bona fide* design.
July 19	WHITLEY BAY PUBLIC ELEMENTARY SCHOOL for 600 scholars, for the County of Northumberland Education Committee. *Limited to Architects practising in the County and in the City and County of Newcastle-on-Tyne.* Particulars and plan of site from C. Williams, Secretary to the Education Committee, The Moothall, Newcastle-on-Tyne. Assessor: W.H. Knowles, F.R.I.B.A., F.S.A.
July 30	GRIMSBY TOWN HALL EXTENSION. Estimated cost £26,000. Conditions of competition sent to any applicant on receipt of a stamped addressed foolscap envelope. Full particulars, schedule of requirements, plans of existing buildings, etc., on receipt of deposit £2 (cheques to be made payable to Frank Stephenson, Borough Treasurer), which deposit will be returned to those who send in designs, or if the whole of the particulars are sent back within ten days from the date of their receipt by the applicant. Premiums of £250, £150 and £100. An Architect of eminence will advise in conjunction with the Borough Engineer. Applications to be made to the latter, H. G. Whyatt, Assoc.M.Inst.C.E., Town Hall, Grimsby.
July 31	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thorniiebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
Sept. 1	BRANCH LIBRARY, NEW CROSS, for Deptford Borough Council. Limited to Architects practising in the City or the County of London. Assessor: J. S. Gibson, Vice Pres. R.I.B.A. Premiums, £52 10s., £26 5s., and £10 10s., for three selected designs, and will be awarded in accordance with the conditions contained in the instructions to competitors. Site plan and copy of instruction from Vivian Orchard, Town Hall, New Cross Road, S.E. Deposit £1 1s., refunded on receipt of *bona fide* design or if instructions are returned within 21 days.
Sept. 20	HULL TRAINING COLLEGE FOR TEACHERS in Elementary Schools. The Education Committee invites Architects to submit designs. Premiums of £150, £100, and £50 to authors of the designs placed 1st, 2nd and 3rd respectively. Particulars and plan of site may be obtained of J. T. Riley, Secretary of Education, Albion St., Hull. Deposit, One Guinea, returnable on receipt of *bona fide* design, or the return of particulars within 14 days.

We understand that Messrs. R. Crittall and Co., 197, Wardour Street, W., are to undertake the heating and ventilating of the New Central Y.M.C.A., Tottenham Court Road.

* * *

A reredos of tinted alabaster, with white alabaster figures in high relief, designed by Messrs. J. E. K. and J. P. Cutts, honorary architects, and executed by Mr. Lawrence Turner, has been dedicated at St. Mary's, Tottenham; where also an altar tomb to the memory of the first vicar, the Rev. E. F. Noel Smith, has been erected. The tomb, which is of Caen stone, with a recumbent effigy in white alabaster, is the work of Messrs. Harry Hems and Sons.

Proposed New Works.

ABERDEEN.—Plans for the following new buildings have been passed:—Four dwelling houses on the north side of Albury Road, per Messrs. D. and J. R. M'Millan, architects; granite-polishing mill on the north side of Merkland Road East, for Messrs. Cosgrove, Lindsay, and Lawrie, per Mr. John Paterson, builder; four dwelling houses on the east side of Woodstock Road, for Mr. Joseph Shirras, builder, per Mr. Arthur C. Bruce, architect; alterations in connection with premises No. 244, Union Street, for Mr. T. R. Gillies, per Messrs. Wilsons and Walker, architects; two dwelling-houses on the north side of Mid Stockett Road, for Mr. William J. Mills, merchant, per Mr. George Milne, architect; addition to Gilcomston Milis, Leadside Road, for Messrs. John Strachan and Sons, per Mr. Gordon Forbes, engineer; business premises on the east side of Crown Street, for the Prudential Assurance Co., Limited, per Messrs. Sutherland and George, architects.

BARNES.—The following building plans have been approved:—Stable rear of No. 42, High Street, Mortlake, by Mr. W. Reynolds; store-room near No. 67, Lower Richmond Road, Messrs. John Harrison and Co.; forty houses, Madrid Road, Mr. Alfred Harvey; four houses, Lower Richmond Road, Mr. G. W. F. Bates; and new road (Milton Road), Sheen Elms Estate, Sheen Lane, Mr. Archibald Stanley.

BLACKPOOL.—It is proposed to erect new offices for the Health and Cleansing Departments of the Corporation in Sefton Street. The estimated cost is £4,000.

CARDIFF.—The Technical Schools Committee have decided to recommend the Education Authority to build a new technical instutute at a cost of £40,000.

COATDYKE.—A drill hall for the Airdrie and Coatbridge units of the Lowland Division Engineers is to be erected at a cost of £2,700.

COVENTRY.—A post-card vote has been taken in one of the wards to ascertain the feeling of the burgesses on the question of erecting a town hall. The replies show a majority of more than 80 per cent. in favour of the hall.

DEPTFORD.—The Borough Council have decided to purchase, at a cost of £5,600, a site for a central library.

DERBY.—The Education Committee has decided to ask the Town Council to purchase, at a cost not exceeding £3,000, "The Gardens," Osmaston Road, as a site for a public elementary school for 1,000 children, to replace two condemned schools in the neighbourhood. The area of the site is 5,300 square yards.

DUDLEY.—The Town Council have decided to apply for a loan of £1,250 for extensions to the Training College.

DUNBAR.—The congregation of the Parish Church have decided to build a new church hall and offices at Abbeylands. The cost will amount to £2,000.

EBBW VALE.—Mr. H. Waters' plans for a new drill hall have been approved, subject to certain minor alterations, by the War Office.

FLINTSHIRE.—The Flintshire Education Committee are about to undertake the erection of several new schools in the county. At Greenfield (Holywell) a new mixed school is to be built, to accommodate 350 children, and to replace the present old and inconvenient Bryncelyn National School. The site is near Greenfield Hall. The Holywell Rural District Council plans have been received and passed for the erection of a new school at Northop Hall to replace the school which was recently burned down. A new school is also to be erected at Saltney, at a cost of £3,000, and another at Shotton (in the parish of Hawarden) at a cost of £6,000.

GLASGOW.—The Municipal Buildings Committee of the Corporation have under consideration two schemes prepared by Messrs. Douglas, Hunter, and Whitson for reconstructing the second floor of the Municipal Buildings, one to cost £3,000 and the other about £4,200.

GRANGEMOUTH.—A new church is to be built here at a cost of about £5,000. Messrs. Wilson and Tait, of Grangemouth, are the architects.

GREYSTONES.—The completed church of Our Lady of the Rosary was opened on Sunday. The chancel, transepts, and one bay of the nave were erected in 1903, and the present addition completes the nave, now 80 feet long. Messrs. W. H. Byrne and Sons, of Dublin, are the architects, and Mr. Kinlan was the contractor.

HARROGATE.—A L.G. Board enquiry has been held respecting an application by the Town Council for a loan of £1,700, for extensions to the municipal offices.

HECKMONDWIKE.—The U.D. Council have passed plans for the erection of four almshouses, to be built and endowed by Mr. S. and Miss Smithson, at a cost of £3,000.

ILFORD.—The U.D. Council are considering draft schemes for the erection of a central library in Balfour Road, at an estimated cost of £8,000.

KETTERING.—A fund has been started for erecting a permanent building in place of the temporary iron church of All Saints in William Street. About £600 has already been collected.

LLANDUDNO.—A new gallery is proposed to be erected in the Town Hall, at a cost of £316.

LONDON.—The Trevor estate at Knightsbridge having been sold to Mr. J. C. Humphreys, it is anticipated that considerable rebuilding will take place on the estate to bring the houses up to the standard for the important residential position they occupy. A new road is contemplated from Knightsbridge to Brompton Road. Trevor Square will, however, be maintained.

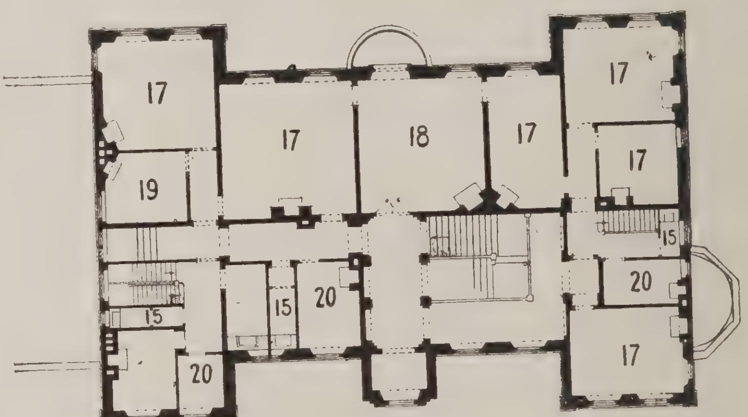
LOUGHBOROUGH.—Funds are being collected for the erection of a church in the newly formed district of St. Peter's. About £2,440 has already been obtained.

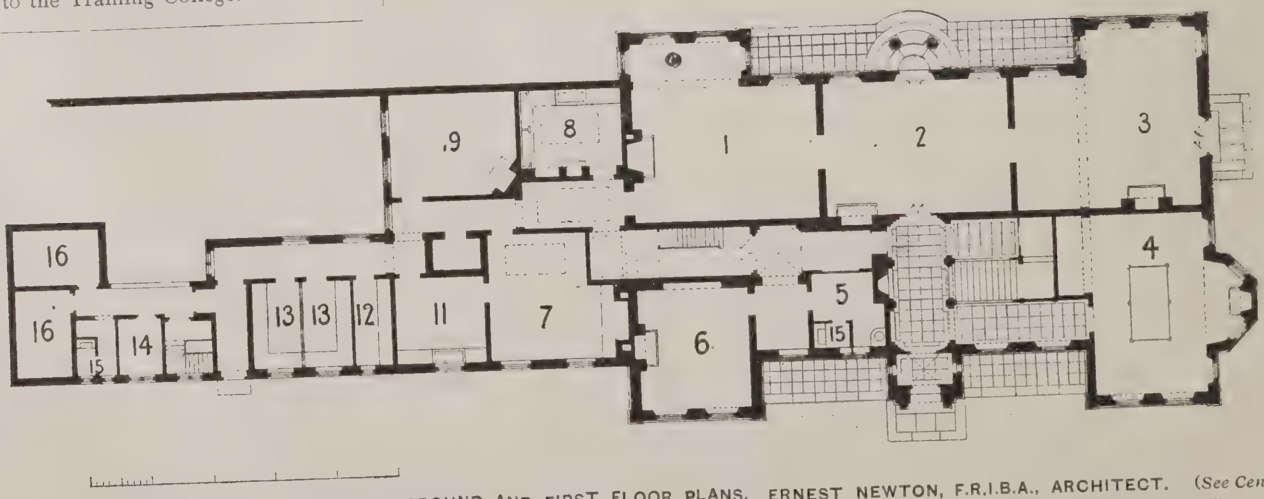
NEATH.—Mr. J. Cook Rees, of Neath, has been appointed, by the Board of Guardians, architect for the new infirmary buildings.

NEWTON ABBOT.—The U.D. Council have approved a scheme for a secondary school for 200 students, at an estimated cost of £7,000 or £8,000.

NORWOOD.—A new secondary school for 450 boys is to be erected at Craster Road.

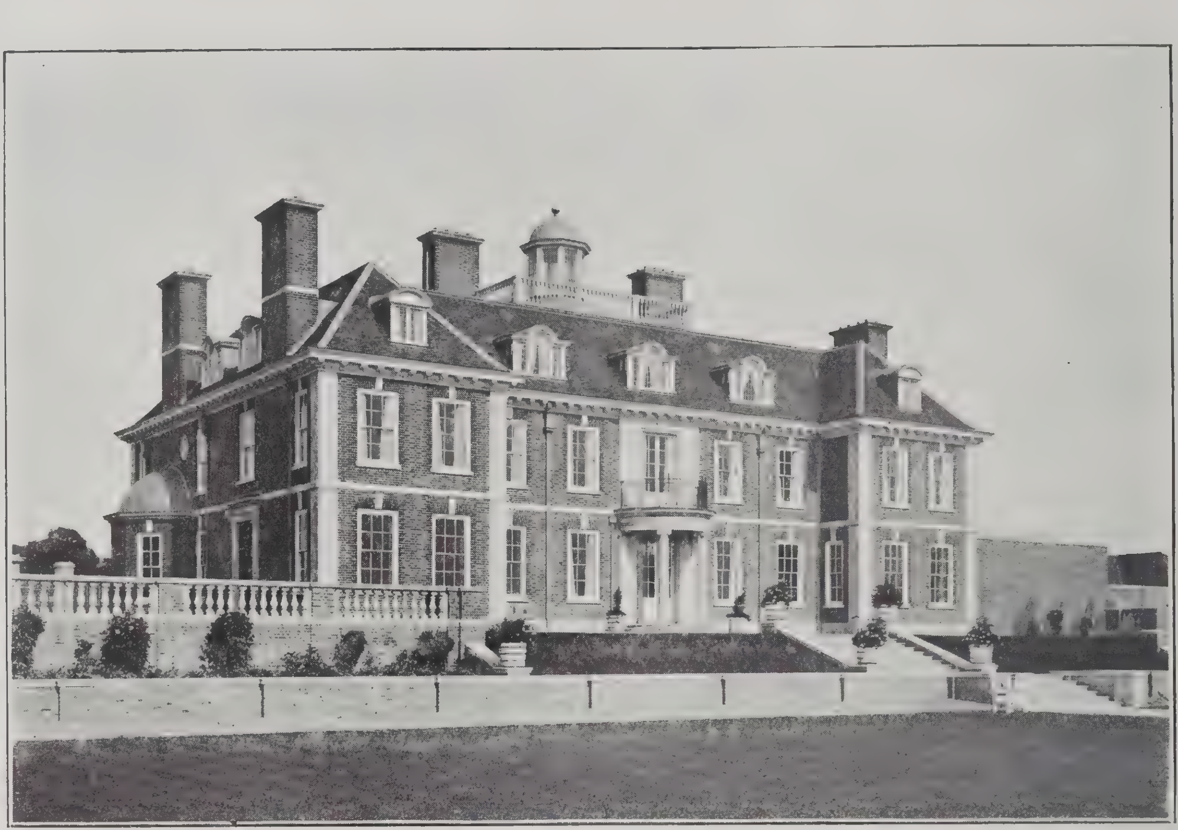
NOTTINGHAM.—The Baths Committee are contemplating the provision of more washing baths at the Victoria and Radford baths. They are also considering the provision of baths for the Meadows district.



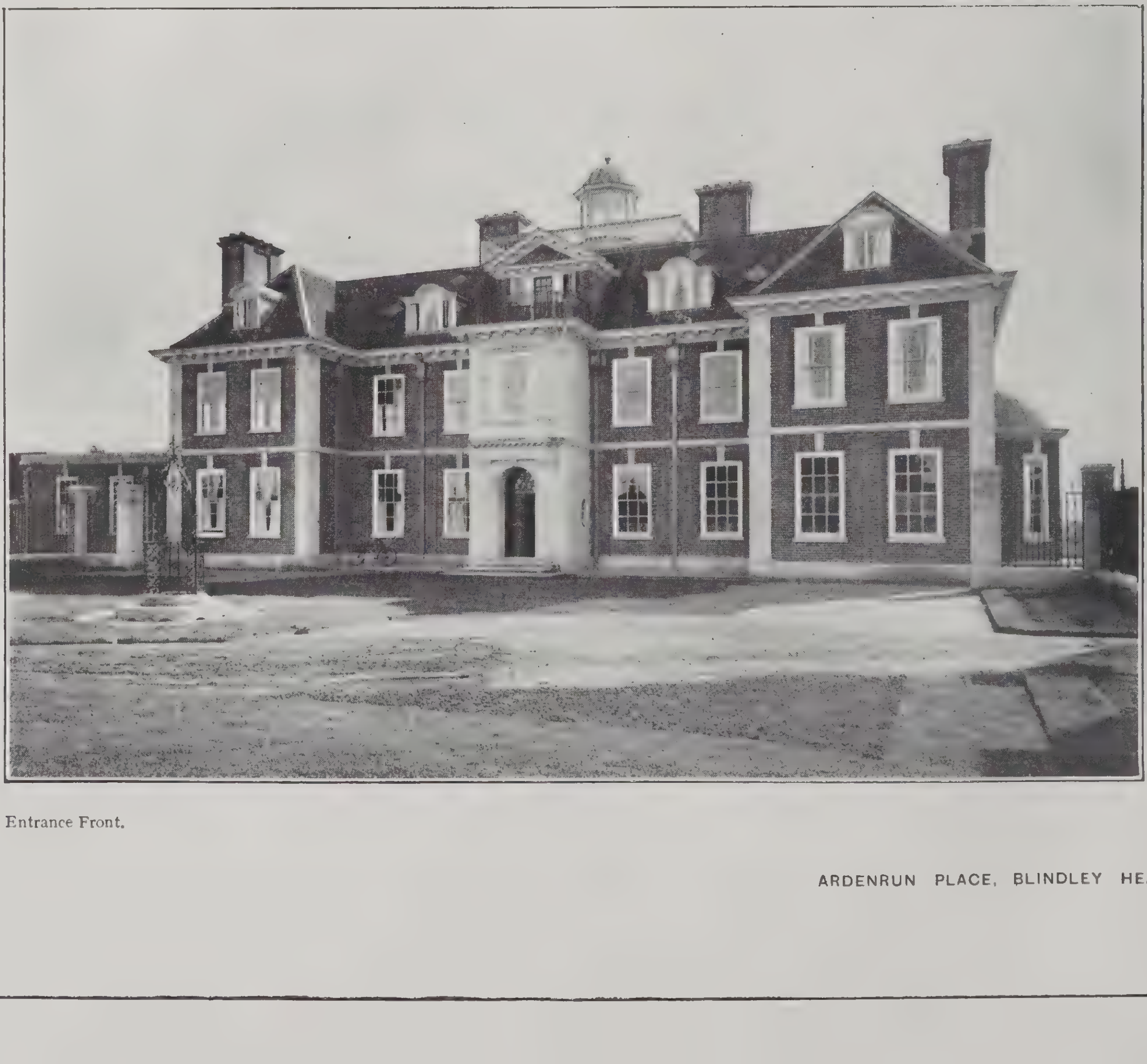


ARDENRUN PLACE, BLINDLEY HEATH, SURREY. GROUND AND FIRST FLOOR PLANS. ERNEST NEWTON, F.R.I.B.A., ARCHITECT. *(See Centre Pl*
8. Dining room. 2. Hall. 3. Drawing room. 4. Billiard room. 5. Lavatory. 6. Study. 7. Kitchen. 8. Butler's pantry. 9. Servants' hall. 11. Scullery. 12. St
13. Larder. 14. Knives and boots. 15. W.C. 16. Coal. 17. Bedroom. 18. Boudoir. 19. Dressing room. 20. Bath room.

Supplement to The Builders' Journal and Architectural Engineer, *Wednesday, July 14, 1909.*

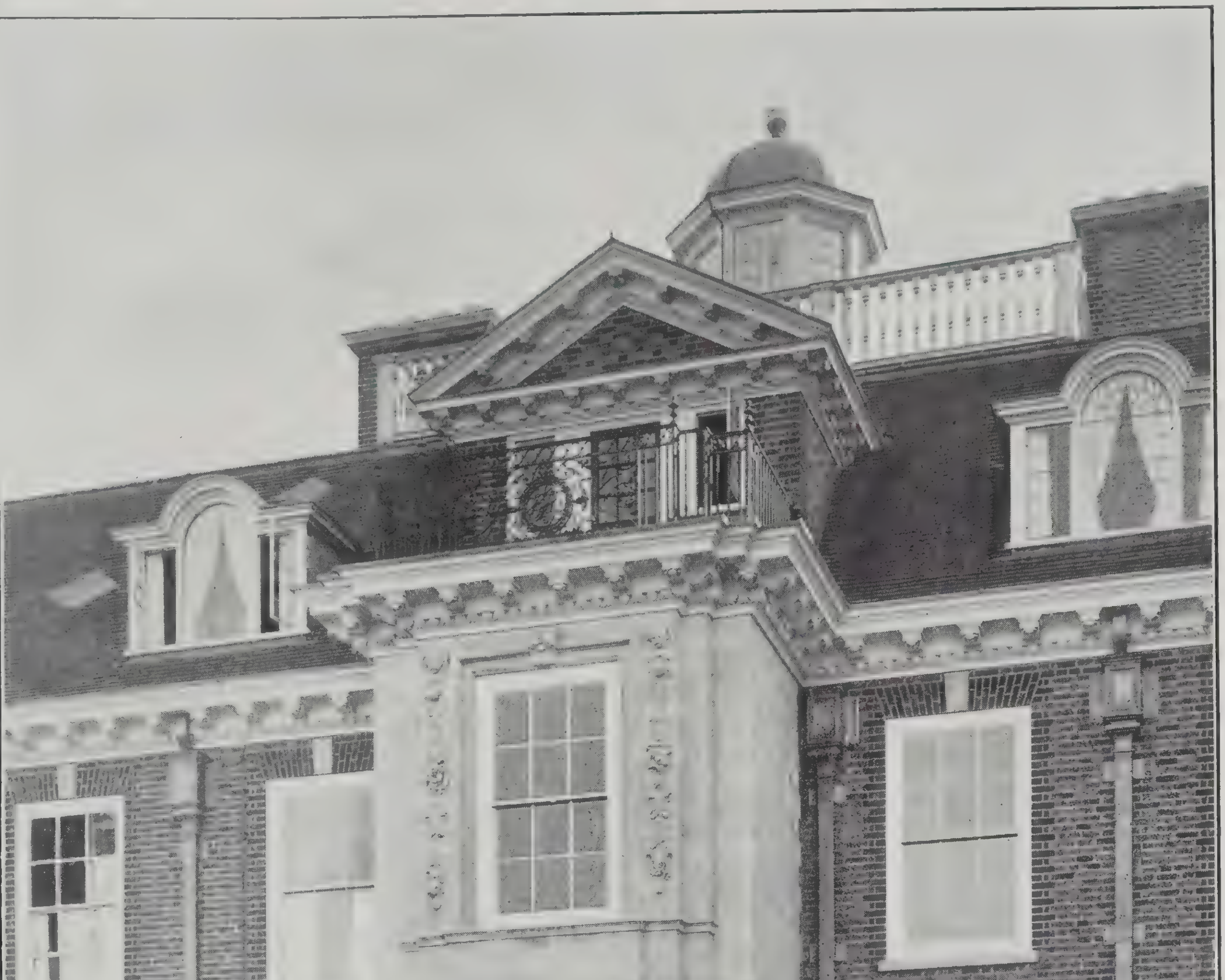


Garden Front.



Entrance Front.

ARDENRUN PLACE, BLINDLEY HEATH, SURRE



Detail of Entrance Front. [Photos: T. Lewis.

ERNEST NEWTON, F.R.I.B.A., ARCHITECT.

NOTTINGHAM.—The Public Libraries Committee are considering the necessity of erecting a more extensive central library. The accommodation in the present building in Sherwood Street, forming part of the University College buildings, is quite inadequate.

PURLEY.—It has been decided by the Croydon County Council to proceed with the scheme for the proposed reservoir at Russell Hill, which is estimated to cost £91,000.

RADCLIFFE.—In consequence of a communication received from the Local Government Board, the Radcliffe Council has decided to delete from the new Town Hall scheme the section intended for a police court and magistrates' rooms, the Board contending that such a building should be provided by the County Council. This will reduce the cost of the Town Hall by £3,000, making it about £12,000.

RADCLIFFE.—A new footbridge across the river in the Cawdaw district is proposed at a cost of £500. A Local Government Board enquiry has been held.

STAND.—The County Secondary School for the townships of Radcliffe, Whitefield, and Prestwich is to be built here at a cost of £21,000.

WANSTEAD.—Mr. Carnegie has offered to give £4,000 for the building and furnishing of a public library here, subject to the provision of a site and the raising of a penny rate by the District Council for the maintenance.

WESTCLIFF-ON-SEA.—Messrs. Hoare and Wheeler, of London, have submitted a design for the new Church of St. Saviour, estimated to cost £10,000 in all and arranged to seat 900 people. Efforts are being made to raise the money required to proceed with the nave and transepts—about £6,000 to £7,000.

WESTMINSTER.—A committee, on which the Duke of Norfolk has consented to act, is being formed to raise funds for the provision of an organ of adequate size in the Roman Catholic Cathedral. The cost is estimated at £10,000.

WINDERMERE.—The U.D. Council has adopted a scheme for the improvement of Bowness Bay, to cost about £10,000. They are also applying for a loan of £3,000 for further sewerage work.

WORCESTER.—As a memorial to the late Rev. H. H. Woodward, precentor of the cathedral, the choir school is to be rebuilt at a cost of between £3,000 and £4,000.

YARMOUTH.—Plans have been approved for the following:—Children's ward, hospital, for Hospital Trustees; alterations, Selby Place, Messrs. Davy and Sons; bungalow, Elm Grove Road, Mr. A. Gunns; rebuilding store, South Quay, Messrs. J. and W. Stuart; shop front, 66, Middlegate Street, Mr. W. Benjafield; additions to fishing premises, Charles Street, Mr. H. Sutton; shop front, 37, Regent Road, Mr. G. H. Gowing.

YELVERTON.—Sir Charles Nicholson, of London, has submitted his design for the new church to accommodate 350 persons, at a cost of £4,500. Of Gothic design, and built of local Hamhill stone, with Doulton stone and granite facings, the proposed new church would measure 100 ft. by 45 ft., with a chancel, nave, two isles, large vestries and a tower at the east end of the north isle of some 65 ft. A gable roof is provided for, and whilst the architect has arranged for doors at the west end and east end, a large north porch would form the principal entrance.

Mr. John B. Thorp, who worked out and built the excellent representations of "Old London" which were so popular last year at the White City, having been seen by nearly half a million people, including Her Majesty the Queen and many members of the Royal Family, has made arrangements with the Golden West Exhibition Committee to exhibit the work at Earl's Court. "Old London" has been opened in the "Midway," and is again proving a great attraction. Doubtless many of our readers will be glad to have another opportunity of seeing this interesting work.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns.

Gordon's Formula for Struts.

KIDDERMINSTER.—"H." writes: "Kindly state whether, in Gordon's formula for stanchions and posts (see below) W=safe load, or the breaking load in lbs. per square inch of area of cross section of pillar."

In Gordon's formula, the resulting load will be a safe load or breaking load, according as f is taken as the safe or the breaking stress. See also my replies on this formula in THE BUILDERS' JOURNAL of February 17th and April 14th, 1909.

The best form of the formula is

$$W=\frac{f\,A}{1+\frac{l^2}{r^2}}$$

In the query it is given as $W=\frac{f}{1+\frac{l^2\div r^2}{A}}$;

this is incorrect, but is probably a slip.

A.

Dark Grey Cement.

KILMALLOCK.—T. A. W. writes: "Please state the best method of getting a permanent dark grey or blue grey colour in external cementing. Would fine clean breeze be objectionable?"

The substitution of smith's ashes for sand in cement mortar will give a permanent dark grey colour. There would probably be no harm in the use of fine breeze for a similar purpose. A bluish colour may be obtained by a mixture of three parts of fine iron scale, three of cement, and two of clean river sand.

G.

Treating Laundry Liquid Waste.

LONDON, E.C.—H. P. E. writes: "Is there any method of treating laundry waste so as to render it free from foreign matter?"

Filtration will absorb some of the suds and coarser dirt, but you may need five beds at different levels, and these occupy more space than most laundries can spare or buy. Chemical treatment is too complex for reply here, and the methods are said to be costly and not complete. A complete analysis of the hardness of the water and of the soaps, starches, and glazes used is required in each case. Time and temperature are also factors, and the waste liquid has to be heated or cooled if success is to be attained. The chemist to a laundry association should be able to advise you in detail. INGENIOR.

Institute of Sanitary Engineers' Examinations.

Our correspondent "F. L.," who asks for information on this subject, should apply for full particulars as to the examinations to the Secretary of the Institute of Sanitary Engineers, 120 and 122, Victoria Street, London, S.W. The prospectus, which will be sent to him on application, contains full information as to subjects of examination, dates and places at which examinations are held for the two classes of membership, but if he also encloses 7d., he will be sent, in addition, a further pamphlet containing fuller information and advice, and also a copy of a set of examination papers recently set. Each examination extends over two days, and both are held in May and November each year, in London and certain provincial centres. Our correspondent might also be interested to obtain particulars of the Royal Sanitary Institute, for which he should write to the Secretary. Examinations are held for certificates for local surveyors and inspectors of nuisances. B. AND B.

Buildings to Measure in the Croydon District.

SOUTH CROYDON.—NEMO writes: "Could you kindly mention, as suitable for measuring, a few buildings, preferable Renaissance or Tudor, within about 20 miles of Croydon?"

Presumably London is to be excluded, otherwise many examples could of course be found there. Hampton Court Palace will provide a wealth of work, both Renaissance and Tudor, and permission to sketch and measure is readily obtained. Other buildings within the radius are the Whitgift Hospital at Croydon, Bromley College (entrance possibly by Wren), Eltham Palace, Eltham Golf Clubhouse (Wren; fine staircase), Pendell House, Bletchingly (attributed to Inigo Jones), and Ightham Moat. There are several large mansions within the district, *e.g.*: Knole (Sevenoaks), and Foot's Cray Place; but permission to measure is usually refused.

G.

Ware's "Complete Body of Architecture."

In reply to "S," Mr. B. T. Batsford, 94, High Holborn, to whom the query was submitted, states that Ware's "Complete Body of Architecture" is not worth more than 15s. or £1, according to condition, and is not very rare.

Space and Weight of Water.

Mr. Herbert A. Mitchell, P.A.S.I., Winchester is thanked for pointing out that in our issue for May 5th, p. 434, under the heading "Capacity of Cyclinder," the statement that one pound weight of water occupies 26 2-3rds cub. ins. should read 27 2-3rds cub. ins. (i.e., 1-10th of 276 cub. ins.), as there are 10lbs. to 1 gallon of 276 cub. inches.

Buildings to Sketch at Oxford.

In reply to several correspondents who desire information with reference to the buildings at Oxford that are best worth sketching, a contributor supplies the following list: From the abundance of material for the study of Renaissance architecture in Oxford, the following selection (arranged approximately in progressive chronological order) may be made: Wadham College Quad, with interiors of hall and chapel (1613); Archbishop Laud's Convocation House (1630); St. John's College back quad and garden front (1631-5); porch of St. Mary's Church (1637); Dean Duppa's organ case in the cathedral (1630); Lincoln College Chapel; arch in Botanical Gardens (Nicholas Stone), Ashmolean Museum entrance front; Sheldonian Theatre (Wren, 1668); Trinity College Chapel (Wren and Aldrich, 1691-4); Queen's College Library (Wren, 1693-6); All Saints' Church (Aldrich, 1700); Peckwater Quad at Christ Church (Aldrich, 1705); Clarendon Building (Vanbrugh and Hawksmoor, 1710); Queen's College, street front and quadrangle (Hawksmoor, 1713-30); Radcliffe Camera (Gibbs, 1749). The two latter are the most complete classic buildings in Oxford. Permission to sketch during vacation time can generally be obtained by application to the proper authorities—for the various colleges usually their respective presidents. Facilities for measuring are less readily granted, and it is useful to know when buildings are likely to be under scaffolding. At present Wren's Tom Tower at Christchurch is in this condition (hardly classic, though!), and it is probable that the garden front of St. John's—one of the finest things in Oxford—will shortly be so Details of fittings—such as the interiors of libraries, halls, and chapels, which can be measured without special preparations, are, of course, less troublesome. Trinity Chapel and Queen's Library may be quoted as examples. Outside Oxford, Abington should be visited, and the Town Hall and several interesting almshouses around the churchyard and in Ock Street seen; while a visit should also be paid to Blenheim Palace, at Woodstock, Sir John Vanbrugh's most colossal work. G.

R.I.B.A. Examinations.

MANCHESTER.—S. writes to the effect that students preparing for the R.I.B.A. Final Examination would be glad of guidance as to the requirements under the revised regulations.

We hope to be able to publish, in an early issue, an article in which this difficulty will be met.

Stresses on Domes.

GLASGOW.—READER writes: "Please explain how to calculate, by the graphic method, the stresses in a semicircular dome."

The graphic method is not applicable to stresses on a dome. Tarn's "Mechanic of Architecture," which can probably be seen in a public library, contains a chapter on domes. HENRY ADAMS.

Permanent Green Stain.

HALIFAX.—PROCTOR asks: "Please recommend a really permanent green stain for use in staining pitch-pine for internal woodwork."

"Matsine," manufactured by Messrs. Mander Brothers, of Wolverhampton, can be recommended by the writer. When the green colour of this is applied to pitch-pine, it yields some remarkable effects of a peacock blue, or green shades varying and changing from the position in which the work is viewed. No doubt the firm would be glad to send you a sample if you would apply to them. The blue "Matsine" also produces artistic and novel effects. J.

Length of Hip Rafter.

BRIDGEND.—A. J. J. writes: "A building 18ft. wide has its front wall at right angles to its side walls, which are respectively 36ft. and 46ft. long. The pitch of the roof is 45 degrees, and it is hipped at the ends at pitch of 60 degrees. Draw to ⅛ scale the outline plan of the roof, and determine the lengths of the hip rafters."

As the sides are at 45 degrees pitch, the height of the ridge will be equal to half the span. Then, as the ends are at 60 degrees pitch, this angle set off from face of building to cut the ridge will be the plan of hip. A right angle set up on plan from junction of hip and ridge, and cut off at a length equal to half span, will, if joined to angle of building, give true length of hip rafter. In answer to a further question, for information on designing cottage hospitals, see Sir Henry Burdett's "Cottage Hospitals" (10s. 6d.), Worcester and Atkinson's "Small Hospitals" (5s. 6d.), Sir Douglas Galton's "Healthy Hospitals" (10s. 6d.), and Mark's "Principles of Planning" (8s. 6d. net). HENRY ADAMS.

Calculations for Steel Girder.

EDINBURGH.—"S" writes: "A steel girder is required to span an opening of 30ft., and to carry a distributed load of 30 tons. The deflection at centre is not to exceed one-thousandth of the span, and working stress in flange is limited to six tons per square inch. Required, the necessary depth of girder and (neglecting web) flange area."

The deflection at the centre of a uniformly loaded girder of span L carrying A weight of W tons is given by

$$8=\frac{5\,WL^3}{384\,EI} \quad .. \quad .. \quad .. \quad (1)$$

Where E = Young Modulus in tons per sq. in.
I = Moment of Inertia in inch units.

If f is the max. stress in tons per sq. in., d is the distance from the neutral axis to the extreme fibre and M the max. bending moment.

$$f=\frac{M\,d}{I}=\frac{WL}{8}\cdot\frac{d}{I} \quad .. \quad .. \quad .. \quad (2$$

Now if deflection $= \frac{1}{1000}$ span, combining equations (1) and (2)

$$\frac{L}{1000}=\frac{5\,WL^3}{384\,E\,I}=\frac{5}{48}\cdot\left(\frac{W\,L}{8\,I}\right)\cdot\frac{L^2}{E}$$

$$=\frac{5}{48}\cdot\frac{f}{d}\cdot\frac{L^2}{E}$$

$$\therefore d=\frac{5000\,.\,f\,.\,L}{48\,.\,E}$$

If $f=6$ tons per sq. in. $L=30'=360''$ and $E=13{,}000$

$$d=\frac{5000\times 6\times 360}{48\times 13000}=17\cdot 3 \text{ in.};$$

but d is half the depth of the girder, assuming the section t be symmetrical about the neutral axis ∴ depth of girder $=2\,d=34\cdot 6$ in. say 3 ft. To get the necessary section assume breadth of flange $=\frac{\text{depth}}{3}-12''$; nett breadth allowing for 2 $\frac{7}{8}''$ rivets $=(12-2\cdot\frac{7}{8})=10\cdot 25$. Then section modulus neglecting web = area of flange × depth,

$$=10\cdot 25\,t\times 36, \text{where } t=\text{thickness of flange.}$$

$$\therefore B\,.\,\frac{M}{f}=\frac{W\,L}{8\,f}=10\cdot 25\times t\times 36$$

$$\therefore 10.25\times t\times 36=\frac{30\times 360}{8\times 6}$$

$$t=\frac{30\times 360}{36\times 10\cdot 25\times 8\times 6}$$

$$=\tfrac{5}{8} \text{ in. nearly.}$$

If nett flange area is required this is given by

$$A=\frac{WL}{8\,f\,D}=\frac{30\times 360}{8\times 6\times 36}=\frac{300}{48}=6\cdot 25 \text{ sq. in.}$$

A.

GLASGOW ARCHITECTURAL CRAFTSMEN'S SOCIETY.

The annual report, 1908-9, of the Architectural Craftsmen's Society of the Glasgow and West of Scotland Technical College shows that during the session seven new members were admitted, six resigned, and seventeen were struck off the roll; the present membership being 118, against 134 in the previous year. During the session, the following addresses or lectures have been heard:—President's opening address, Mr. J. Campbell Reid, A.R.I.B.A.; "The Preservation of Our Ancient Buildings," Sir John Stirling Maxwell; "An Architectural Tour in France," Prof. C. Gourlay, B.Sc., A.R.I.B.A.; "The Construction and Working of a Septic Tank and Circular Bacterial Percolating Filters," Mr. Thomas Davis; "The Construction and Arrangement of Laboratory Fittings," Mr. Colin Sinclair, M.A.; "Contracts and Contracting," Mr. Robert Murdock, F.S.I.; "Reinforced Concrete," Mr. F. A. MacDonald; "The Personal Factors in Italian Renaissance Architecture," Vernon Constable, A.R.I.B.A.; "A Tour through Somersetshire," Mr. T. G. Gilmour; "A Portland Stone Building," Mr. Thomas McCrae; Discussion on Reinforced Concrete Construction, opened by Mr. Vernon Constable. Visits were paid to the following buildings, the names of whose architects are given in parentheses:—Additions to Clyde Trust Buildings (John Burnet and Son); New Mitchell Library Buildings (W. B. Whitie, F.R.I.B.A.); Royal Infirmary Buildings (James Millar, A.R.S.A.); New Liberal Club Building (Campbell Douglas and A. N. Paterson); Additions to Merchants' House (John Burnet and Son); Northern Assurance Company's Buildings (J. A. Campbell, F.R.I.B.A.). The joint secretaries are Mr. John Wilson and Mr. Alexander Davidson.

In describing the Letchworth cottages (Mr. Edmund A. Fermaud, architect) illustrated on p. 13, in our issue for July 7th, it was stated, by a regrettable slip of the pen, that they were placed first by the committee of assessors at the last Letchworth Cottage Exhibition. They won a second prize, the design by Mr. W. J. Lewton, of Reading, being placed first.

Buildings in Progress and Completed.

AYR.—A new roller-skating pavilion has been opened here. It is constructed of white fibrous plaster slabs, after the manner of exhibition buildings, and comprises in addition to the rink space of 16,000 square feet, with its maple floor, tea rooms, rink buffet, roof tea garden, smoking lounge, promenade and garage. The architect was Mr. J. Campbell Reid, A.R.I.B.A., of Glasgow, and the contractors were Messrs. J. and D. Meikle, of Ayr.

BIRMINGHAM.—The tender of Messrs. Waring and White, London, at £128,744, has been accepted by the City Council for the superstructure of the Council House extension.

BLYTH.—A new manse for the Waterloo Road Presbyterian congregation is in course of erection at a cost of £1,200. Mr. John Goulding, of Blyth, is the architect, and Messrs. J. and E. Simpson are the contractors.

BOURNEMOUTH.—Extensive alterations and improvements are being carried out at the Shaftesbury Hall, St. Peter's Road, from the designs of Messrs. Creake, Gifford and Oakley. The cost will be £1,600. Messrs. Jenkins and Sons, Ltd., are the contractors, and the electric light is being installed by Messrs. Chadwick and Roberts.

CARLTON-IN-CLEVELAND.—Mr. Temple Moore, of London, has submitted sketch designs for the proposed new church, which is to cost £1,000.

CARMARTHEN.—The Shirehall has been reopened after alterations and decorations from the designs of Mr. W. Vincent Morgan (County Architect). The contractors were Messrs. B. Howell and Son, Llanelly.

CLAYGATE. — A new Swedenborgian Church has been erected here to seat 180 people. The stained glass and mosaic was designed and detailed by the architect, and made by Messrs. George Wragge, Ltd., and Rust's Vitreous Mosaic Co. respectively. The buildings are heated by open fireplaces, and there are also some radiators. The architect was Mr. Ernest Edward Trobridge, of 87, Cheverton Road, London, N., and the contractor was Mr. Higby, Claygate.

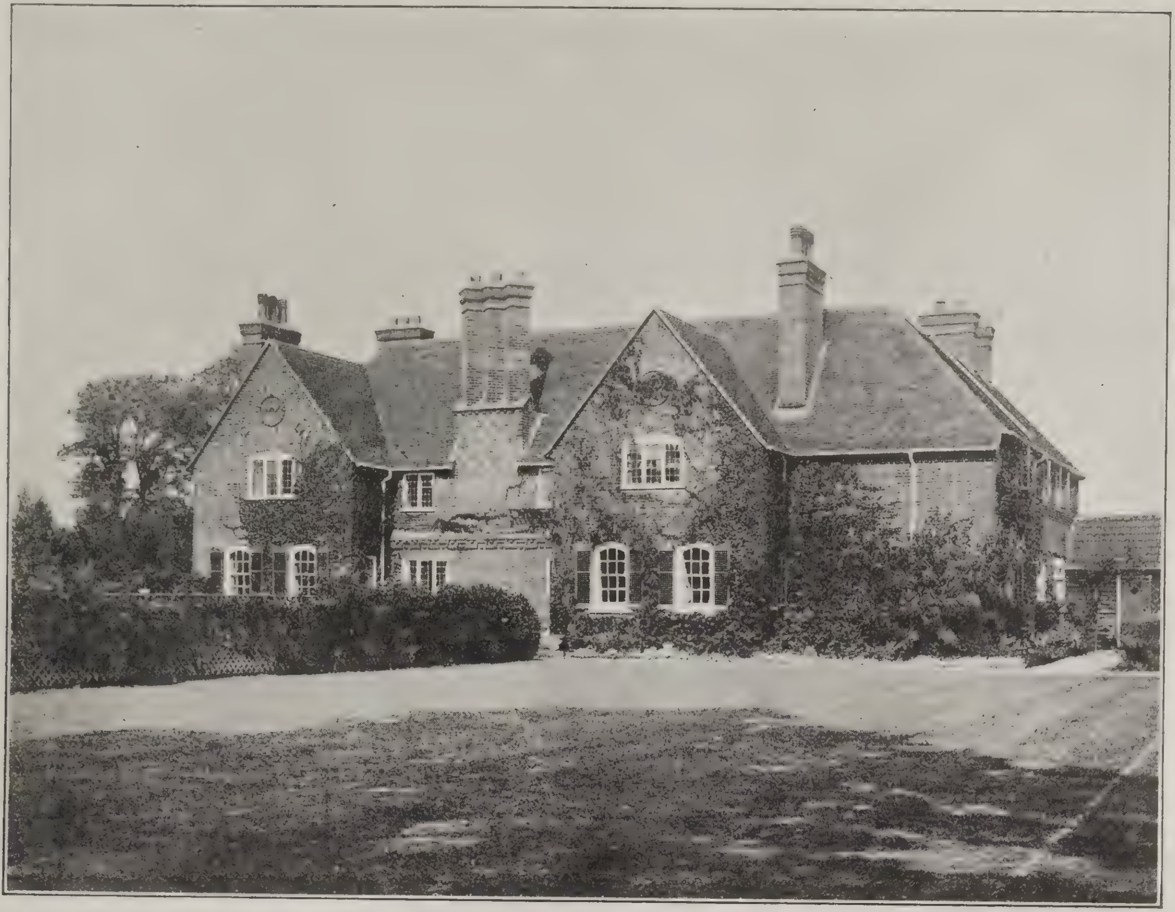
CRICKLEWOOD.—The foundation stone of St. Michael's Church has been laid. The new building will provide accommodation for 754 persons. The principal dimensions are: Length 152ft. 10½ins., width 60ft., height to ridge 55ft., and the chapel will be 50ft. long, and 15ft. wide. Mr. J. S. Alder is the architect, and Mr. H. Knight the builder.

DEWSBURY.—A new frontage, designed by Messrs. Holton and Fox, of Dewsbury, is being erected to the Hippodrome. The contractors for the masonry and brickwork are Messrs. Humphries and Green, of Dewsbury; the joinery work is being done by Messrs. Clegg Bros., of Westtown; Mr. J. E. Talbot is fitting up the lavatories, improving the gas fittings, and doing the necessary plumber's work; Messrs. Maclean, of Leeds, are doing the concrete and laying mosaic pavements to main entrances; Mr. Bottomley is providing the patent glazing for the verandah; Mr. Hodgson is responsible for the plastering; Messrs. A. Hirst and Son, Ltd., Victoria Road, are putting in the electric lights; and the decorations, inside and out, have been entrusted to Mr. Ned Ramsden, of Halifax Road.

DONYATT.—The Somerset County Council has accepted the tender of Mr. R. G. Spiller, Chard, at £519, for rebuilding Donyatt Bridge.

EDINBURGH.—The Royal Institution having found new quarters at the New Art School in Lauriston, the Royal Institution building is being reconstructed to fit it for the use of the Royal Scottish Academy. Mr. W. T. Oldrieve, F.R.I.B.A., F.S.A., of H.M. Office of Works, Scotland, is the architect.

GARNDIFFAITH.—A new institute, containing a public hall to seat 600, a billiard-



FOURACRE, WINCHFIELD, HANTS. GARDEN FRONT. ERNEST NEWTON, F.R.I.B.A., ARCHITECT.

This house is built with red sand-faced bricks and tile roof. The woodwork generally is painted white, with the exception of the doors and shutters, which are green. The pattern work on the gables and between the wings is executed in plain projecting bricks, and the diaper work on the chimneys with flare ends.

room for 3 tables, reading-room, library, coffee bar, and caretaker's rooms, has been erected at a cost of £1,800, from the designs of Mr. W. Beddoe Rees, of Cardiff. Messrs. Bailey Bros., Pontypool, were the builders.

GREAT HOLLAND.—A new village hall is being erected here at a cost of £850. Mr. W. Hayne is the architect, and Mr. A. E. Farr the builder.

HATCH BEAUCHAMP.—The Somerset County Council have accepted the tender of Messrs. H. Pittard and Son, Langport, at £372, for rebuilding Bottle Bridge.

IRVINE.—The extensions of the Cunningham Combination Poorhouse have been completed. The new buildings include a board room, governor's office, and probationary wards, and have cost £5,000. Mr. Hay was the architect

LITTLEHAMPTON. — The tender of Messrs. Linfield and Sons at £1,446 has been accepted for the new pavilion and shelter.

LONDON.—H.M. the King laid the foundation stone, on Thursday last, of the Imperial College of Science and Technology buildings, at South Kensington, on a site adjoining the Royal College of Music. The new buildings, designed by Sir Aston Webb, R.A., will house the mining, metallurgical, geological, and engineering departments of the Imperial College.

LONDON. — The County Council are about to rebuild the School of Photo Engraving and Lithography, Bolt Court, Fleet Street, at a cost of £15,000.

NORTHAMPTON.—A roller-skating rink has been erected at the George Hotel. The floor surface is 110ft. by 53ft., and there is a promenade bay 52ft. by 42ft. Mr. E. F. Goulding was the architect, and Mr. A. M. Dunham the contractor.

NOTTINGHAM.—The foundation stones of the Albert Hall Institute in Great Hall Street, Derby Road, have been laid. The building is designed in the Old English style of architecture with half timber work, the remainder being done in buff bricks. On the lower floor there are to be a gymnasium, a billiard-room, buffet, reading-room, and kitchen, this floor being designed exclusively for the use of the men. On the first floor is to be a hall, capable of seating about 600, together with two or three offices, for mission work. On the middle floor there will be a suite of four rooms for the sisters of the mission, and on the second floor a large church parlour and five other rooms of various sizes, to be used for church meetings of all kinds. On the top there are a hall, 45ft. by 30ft., and eight small rooms, to be utilised for the girls' social work. The institute is of fireproof construction throughout, and is estimated to cost nearly £9,000, exclusive of furnishing. Mr. A. E. Lambert is the architect.

PARTICK.—A new Congregational church is being erected here from the designs of Mr. George Simpson, Glasgow. The church is being built of red sandstone, and will accommodate 600 persons. There is also a hall to hold 250. The cost will be £3,000.

PELTON.—A new institute has been erected by the owners of the Pelton Colliery for their workmen. Mr. J. T. Lee, F.R.I.B.A., is the architect, and a drawing of the building is exhibited at the Royal Academy.

PERTH.—The foundation stone of the new City Hall has been laid by Lord Provost Cuthbert. Mr. C. E. Clifford, of Glasgow, is the architect.

PORTADOWN (IRELAND).—New National schools have been opened here. Mr. J. W. Walby was the architect, and the builders were Messrs. Collen Brothers. The total cost was £2,400.

PORT-GLASGOW. — The improvement scheme in the Bay Area, to cost upwards of £80,000 has been commenced by the demolition of the old properties. Messrs. P. McBride and Co., contractors, of Port-Glasgow, have secured the contracts for the digger, mason, brick, slater, and joiner works.

RAWDON.—A new R.C. church for the districts of Rawdon, Yeadon, and Guiseley, has been erected here. Mr. E. Simpson, of Bradford, was the architect.

RETFORD.—The foundation stone of a new dispensary in connection with Retford Hospital was laid on the 30th ult. The building, in the Gothic style, has been designed by Mr. William Southall, and the contract has been let to Messrs. Thomas Hopkinson and Son, of Retford.

SANDYFORD.—A new Wesleyan chapel for 300 persons is being erected at a cost of £2,000. Mr. Henry Dain, of Tunstall, is the architect, and Mr. Paul Pemberton, Tunstall, is the builder.

SCHOLES.—The Barwick Parish Council offices have been opened. The premises provide a council room 28ft. by 18ft., with living accommodation for the assistant overseer, at a cost of £650. Mr. H. M. Chippindale, of Scholes, was the architect, and Mr. G. Wilson, of Whitkirk, the builder.

SCISSETT.—A new parish room is being erected here at a cost, including land, of £1,200. Messrs. John Kirk and Sons, of Huddersfield, are the architects; and contracts have been let to the following:—Mason and bricklayers' work, Messrs. George Hinchliff and Son, Clayton West; joiners' work, Messrs. Issac Wray and Son, Clayton West; plasterers' work, Mr. W. S. Needham, Clayton West; plumbers' work, Messrs. George Garton and Son, Huddersfield; painters' work, Mr. William Jubb, Denby Dale; slaters' work, Mr. W. E. Jowett, Huddersfield; concreters' work, Mr. John Cooke, Huddersfield; and heating apparatus work by Messrs. T. A. Heaps and Co., Ltd., Huddersfield.

SELBY.—A new oil and cake mill for Messrs. Joseph Watson and Sons, Ltd., soap manufacturers, of Leeds, is in course of erection at an estimated cast of £100,000. Sir Alfred Gelder, F.R.I.B.A., of Hull, is the architect.

SOUTHAMPTON.—A new wing is being added to the Western District Council Schools to provide additional accommodation for 240 boys, 240 girls, and 120 infants. The cost is estimated at £6,500. The plans have been prepared by the Borough Engineer.

SUNDERLAND.—The west end branch library, erected at the cost of Mr. Carnegie, has been opened. Mr. Hedley was the architect.

SUTTON-IN-ASHFIELD.—The contract for the erection of the Council's new school at Sutton-in-Ashfield has been let to Messrs. T. Fish and Sons, of Nottingham, for £5,738 12s. The school is to provide accommodation for 200 scholars in the higher standards, and 120 in the higher elementary. Provision will be made for a cookery room and laboratory, and a workshop for manual instruction.

SWANSEA.—A large block of shops and offices is to be erected at the corner of College and Castle Streets for Messrs. James and Gustavus. Mr. Sydney Crocker, of Cardigan Chambers, Swansea, is the architect.

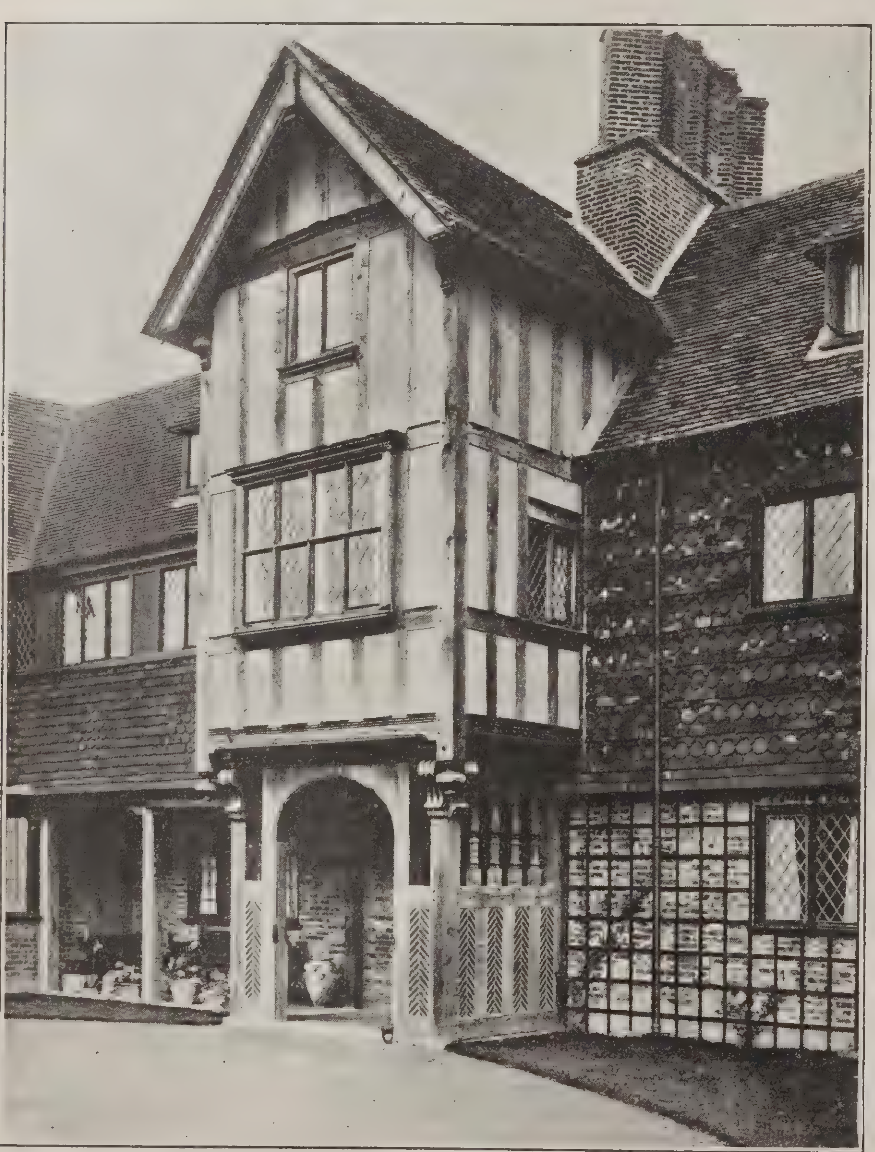
TAYPORT.—A new hall, accommodating 200 people, in connection with the Queen Street U.F. Church, has been erected. Mr. Alex. Lickley, of Bank Street, Dundee, is the architect, and the following were the contractors:—Mason, Mr. W. Kemp; joiner, Mr. W. Dowie; plasterer, Mr. C. Ferrie; painter, Mr. G. Harley—all of Tayport; plumbers, Messrs. Murray and Son, Broughty Ferry; slater, Messrs. A. Hogg and Son, Broughty Ferry; heating engineers, Messrs. James Fyffe and Son, Dundee.

TIDWORTH.—The new Garrison Theatre has been opened. The new building provides seating accommodation for 1,250 persons, and is a plain structure harmonising with the surrounding barrack buildings. Messrs. Billett and Musselwhite were the contractors, and the cost was more than £4,000.

WOKING.—The London and South Western Railway Orphanage buildings have been completed. They are designed to house 150 children, and are faced with red brick and stone dressings. Mr. W. E. Trevena, of Farnborough, was the architect, and Mr. E. C. Hughes, of Wokingham, the builder. The total cost, including equipment, amounts to £24,000.

YEALMPTON. — A new Wesleyan Methodist Chapel and school is being erected at a cost of £1,090. Mr. F. A. Wiblin, of Plymouth, is the architect, and Messrs. Prowse and Son, of Ermington, are the contractors.

YORK.—A new Wesleyan Methodist Sunday School is being erected in Acomb Road, to accommodate from 300 to 400 scholars. The cost will be about £3,200. Mr. T. Monkman is the architect, and the following contracts have been let:—Brickwork, Messrs. F. Shepherd and Son; woodwork, Mr. G. Mansfield; slating, Messrs. J. Dodgson and Son; plastering, Messrs. Young and Sons; plumbing, etc., Mr. J. H. Shouksmith; painting, Mr. R. Pearson, all of York; hot water engineers, Messrs. W. Richardson and Co., Darlington.



UPTON GREY, HANTS. ENTRANCE. ERNEST NEWTON, F.R.I.B.A., ARCHITECT.

The porch and bay-window illustrated were built up with some old oak obtained from a barn that was pulled down, and it is of a rich brown colour.

CONTRACTORS' USE OF COAL: A SCIENTIFIC SYSTEM OF BUYING.

By a Contractor.

Coal is always an unsatisfactory thing for a contractor to buy, because there is no item for it in a bill of quantities. It nevertheless forms a very serious item in his yearly expenditure. The results of the scientific testing of materials generally are steadily coming to be regarded as the only intelligent basis of purchase.

Few contractors would buy Portland cement without being satisfied that it came up to the British standard specification, but so long as cement conforms to the British standard, it will satisfy the architect or engineer who is superintending the contract. Why not apply the system to coal?

Absence of a Standard for Coal.

With coal buying, however, there is no standard to which the quality of any particular sample can be referred for comparison. As coal is a natural and varying product, it is obvious that a fixed standard is impossible. It is, however, not only possible, but extremely simple and inexpensive to establish by tests the money value of any particular coal. At present the ordinary method of buying is to order a sample truck load. If the quality and price seem satisfactory to the individual buyer, he will place the order on the understanding, either expressed or implied, that further supplies shall be equal to the first truck load. He may even specify that the deliveries shall be from the same seam of the same colliery. He has, however, no assurance that he will continue to get coal as good as the first truck load. There remains the question as to how he shall test such deliveries.

The writer of this article, before going further, would make it clear that he is in no way an expert in coal, but is setting down his own experience in coal buying, with the record of actual purchases and the results obtained from them. He felt, on starting to buy coal for a large contract near London, that the time had come to be satisfied no longer with any particular coal because it was black, but to employ some simple and practical method by which a uniform amount of steam-raising power could be secured for every penny that was spent. The practice of paying for coal according to its steam-raising power, and not on the arbitrary price per ton asked by a coal merchant, is well established in the United States. It is also employed in England by large and regular users, such as electric generating stations and Government Departments. There is no reason, however, why any contractor who uses as much as 50 tons a week should not adopt the same methods, though in a form simpler than obtains with very large organisations.

Methods of Coal Analysis.

There are roughly two sorts of analyses of coal which can be taken. One gives the percentage of carbon, ash, hydrogen, nitrogen, oxygen, and sulphur. Such an analysis is largely of academic interest. Contractors do not want to know about hydrogen and nitrogen, but about steam-raising. As to sulphur, contractors' plant is rarely of a delicate character, nor is it generally too well maintained. An excess of sulphur in coal tends to produce corrosion of the fire-box, but with boilers of simple type this is not a serious matter. To take tests for sulphur, and to establish any scheme for reducing the price of any particular coal by reason of its excess of sulphur, brings in an unpractical element of complication. The quantity of sulphur, then, is neglected in the present consideration of the question.

UPTON GREY, HANTS. BAY ON GARDEN FRONT. ERNEST NEWTON, F.R.I.B.A., ARCHITECT

Everything of interest has been retained and repaired, but the house had fallen into a very bad state. Inside some fine oak panelling and a massive oak staircase have been preserved.

The other and more practical form of analysis gives the percentages of moisture and ash, and the evaporative power of the coal. The point to keep in view all the time is the contractors' use of coal, which is to boil water. The main feature to look for in every analysis is, therefore, evaporative power. This can be stated in three ways—(1) as calories, (2) in pounds of water evaporated by a pound of coal, and (3) in B.T.U. (British thermal units). All these three expressions of steam-raising capacity have a fixed relationship to each other, but British thermal units have been taken in this article as the most convenient for calculation, and the other two expressions are therefore omitted from the tables to appear later. Calories can readily be turned into B.T.U. by multiplying by 9 and dividing by 5.

The Cost of Carriage.

It must be clearly understood that the B.T.U. afforded by different classes of coal must be considered, not alone, but in relation to the prices of the different coals delivered at the site where the coal is to be used. The cheapest coal may well prove, by reason of its low efficiency, to be the most expensive in actual use. The point to which the coal has to be delivered is obviously of supreme importance. One colliery may produce a coal which gives 10 per cent. more in B.T.U. for the same price per ton at the pit's mouth, than the product of another colliery, but the higher cost of carriage of the superior coal may wipe out the advantage. All calculations, therefore, should be based on the price of the coal, including carriage to its place of use.

The Value of Tests.

The purpose of this article is to show the value of adjusting the purchase price of coal on a sliding scale according to its value in B.T.U., but even if the method (to be later described) is not adopted, tests are worth their cost, if only as enabling the consumer to check the varying quality of consignments of the same coal.

Ten Typical Tests.

Coal from 10 different collieries was tested. In each case, from 30 to 100 tons were purchased at the best prices that the respective merchants would quote, and these prices (which include delivery) will be shown in a table. In some cases the colliery issues copies of the analyst's certificate of the tests they have made on their coal. These are for two main reasons unsatisfactory. In three colliery certificates which are now before the writer, one is dated December, 1900, another September, 1903, and another June, 1904. It is obvious that the seams tested at those dates may have been worked out, and the coal now being produced may be from a better or worse seam. Moreover, these tests are sometimes taken on dry coal, i.e., on coal which has been artificially dried. Seeing that, as proved, the moisture of different coals varies between 10 per cent. and 18 per cent., and that the weight of coal which a contractor buys includes its moisture, and that the proportion of moisture greatly affects its steam-raising capacity, colliery certificates on analysis made in this artificial way need not be regarded very seriously.

In some cases the colliery certificates do the coal less than justice. In one series of tests on three actual deliveries, the B.T.U. averaged 12204, whereas the printed analysis issued by the colliery of the same coal showed only 11768. The discrepancies, however, are generally the other way.

For instance, the sample of coal first tested should have given on the basis of the colliery certificate 76 B.T.U. per penny of cost per ton, whereas on the test of an actual consignment it only yielded 66. In the case of sample B the disproportion was even greater, 72.5 as compared with 58.

It is clear that with coals of different price some common standard of value must be obtained, and the writer has adopted what seems a simple method, viz., of dividing the number of British thermal units by the number of British thermal units by the number of pence of cost per ten, the result being the number of units per penny.

English v. Scotch Coal.

The ascertained units as shown on the ten qualities examined vary from 58 to 74.5. In other words, if all coal purchased had been equal to the sample "J 1," a saving in cost of 22 per cent. would have been effected.

Sample K, however, was one sample out of four consignments from the same district —viz., Fifeshire—though not from the same colliery, and it is of course doubtful as to whether further consignments from K colliery would have yielded such a high steam-raising capacity. It is obvious, however, that these Scotch coals were of better value on the average (the price per ton being taken into consideration) than the average of the English coals marked A to H in the table, as they yielded an average on the four samples of 70.5 units per penny. This result, compared with coal B, shows a saving of about 18 per cent., and compared with B.T.U. 63 the average of English coals A to H a saving of 11 per cent. (The tables will appear with the concluding portion of the articles.)

It must be understood, however, that this comparison of English and Scotch coals with a verdict in favour of the Scotch product applies only to the prices charged for the particular deliveries and to the particular contract, which is on the Thames and is served by a convenient wharf. The conditions were therefore ideal for the economical transit of Scotch coal, which was entirely water-borne. Had the contract been only ten miles from the river, thus necessitating rail as well as water carriage, the extra cost of freight might have turned the scale in favour of English coal. By the same token a reduction in the price of one of the English coals had, as will presently be seen, the same effect.

Proportion of Slack and Hardness of Coal

There are two other general considerations to be taken into account in comparing English and Scotch steam coals. English steam coals are generally either handpicked or screened, and have very little slack or dust. Scotch coals are sometimes sold in London as they come from the colliery, and the percentage of slack is high.

Even if a Scotch coal starts from Scotland screened, the increased handling will produce a considerable amount of slack, even if the coal be hard, and if it be soft the amount will be excessive. In practice, slack gets wasted, and even if a high calorific value is secured from the large coal, it may well prove more economical to be content with a smaller result of B.T.U. per penny from a coal of which every ounce will be used in the furnaces and in using which waste is inappreciable. Further, some of the Scotch coals are markedly softer than some samples of good English coal, and give more trouble in stoking, with the result that firemen tend to use their fuel wastefully.

It is impossible to establish by tests the proportion of slack, and the buyer must therefore judge of this side of the question by his own or his colleagues' practical observations. (See a later paragraph.)

Moisture and Ash.

The percentages of moisture and ash are not of such importance in determining the choice of a coal as the yield in thermal units, but they should not be altogether disregarded. An excess either of moisture or ash, or of both, has the result of reducing the number of B.T.U. yielded, but the disadvantages produced by such excesses have been to a large extent discounted before the steam-raising value of the coal is established. It is nevertheless true. that if there is an undue excess of moisture, part of the steam-raising capacity of the coal is employed in driving off that moisture instead of in heating the boiler. With respect to ash, an excessive percentage not only means undue clinkering, but also that an excess of weight amounting in one case to more than 15 per cent. has to be carted about the contract. Moreover, so great an excess of ash means a very slaty coal, and firemen are likely to throw aside and waste lumps which are particularly slaty. In ordering coal which will be paid for on the result of analysis, it is therefore reasonable that the buyer should specify a maximum percentage both of moisture and ash, say 12 per cent. of moisture and 5 per cent. of ash, and penalise the coal merchants if these percentages prove to be higher on test. Suitable reductions per ton are 1d. per ton for every one per cent. above the maximum percentages fixed. No rule can, however, be laid down, as the fixing of maximums must depend on the normal percentages yielded by the coal ordinarily used in the district.

Slow v. Quick Burning Coal.

If a fire can be kept under perfect control, it is immaterial whether the coal burns slowly or quickly; the B.T.U.'s given by the coal are the sole consideration. Contractors' plant consisting of portable engines, cranes, locos, etc., perhaps scattered over a contract of large area, does not, however, get the supervision that boilers assembled under one roof can receive, nor do contractors' firemen give the necessary attention to damping down a fire either mechanically or by throwing ash or clinker if the fire is burning too furiously. Some Scotch steam coals burn more freely than do English, and an English coal yielding rather fewer B.T.U. may therefore prove to be more economical in use. Fast burning is often, however, due to the virtues of a coal (viz., low percentages of moisture and ash) rather than to its vices. If a coal is dry when bought, it will obviously burn faster than if wet.

Expensive v. Cheap Coal.

In theory it is immaterial whether an expensive or a cheap coal be purchased, providing the standard number of B.T.U. per penny per ton is maintained. In practice, however, a contractor will be wise to buy a coal of average price. To buy the cheapest means excessive percentage of ash or moisture. The most expensive are equally undesirable, for the following reasons: There is apt to be a considerable waste of coal on a builder's contract, particularly if the plant is spread over a fairly large area. Assuming that 5 or 10 per cent. of the bulk of the coal never gets into the firebox, it is better that a cheap coal should be wasted rather than an expensive one. The Welsh smokeless coals have a very high calorific value, but they are costly in London, and do not prove economical unless carefully used. It is unusual for a contractor to get into trouble through discharging black smoke, and the smokeless merit of Welsh coal need not generally be taken into account.

The Practical Man.

Questions of this kind need to be considered by the practical men on the works, and their opinion of the comparative value of different coals should be taken into account in conjunction with the results of tests. The casual opinions of crane drivers do not deserve too close attention, as their knowledge does not extend to the price paid, and consequently does not take into account the amount of steam raised per penny. The present writer in one case ordered two consignments of coal from the same district, one from the best seams and one from the poorest, the difference in price being 5s. 5d. per ton. The speed of burning was about the same in both cases; the yield of B.T.U. was higher by 3,500 in the case of the superior coal; the inferior coal produced five times the normal amount of ash, yet the crane driver reported the inferior coal to be the better of the two! Experiences of this kind create a feeling of some doubt as to the value of firemen's opinions. The opinion of the practical man is of peculiar value when considering as to which of two or three coals yielding the same number of B.T.U. per penny per ton shall in future be ordered. His report on proportion of slack, clean burning, absence or presence of undue clinkering, and general economy of use, will enable the buyer to come to a correct decision.

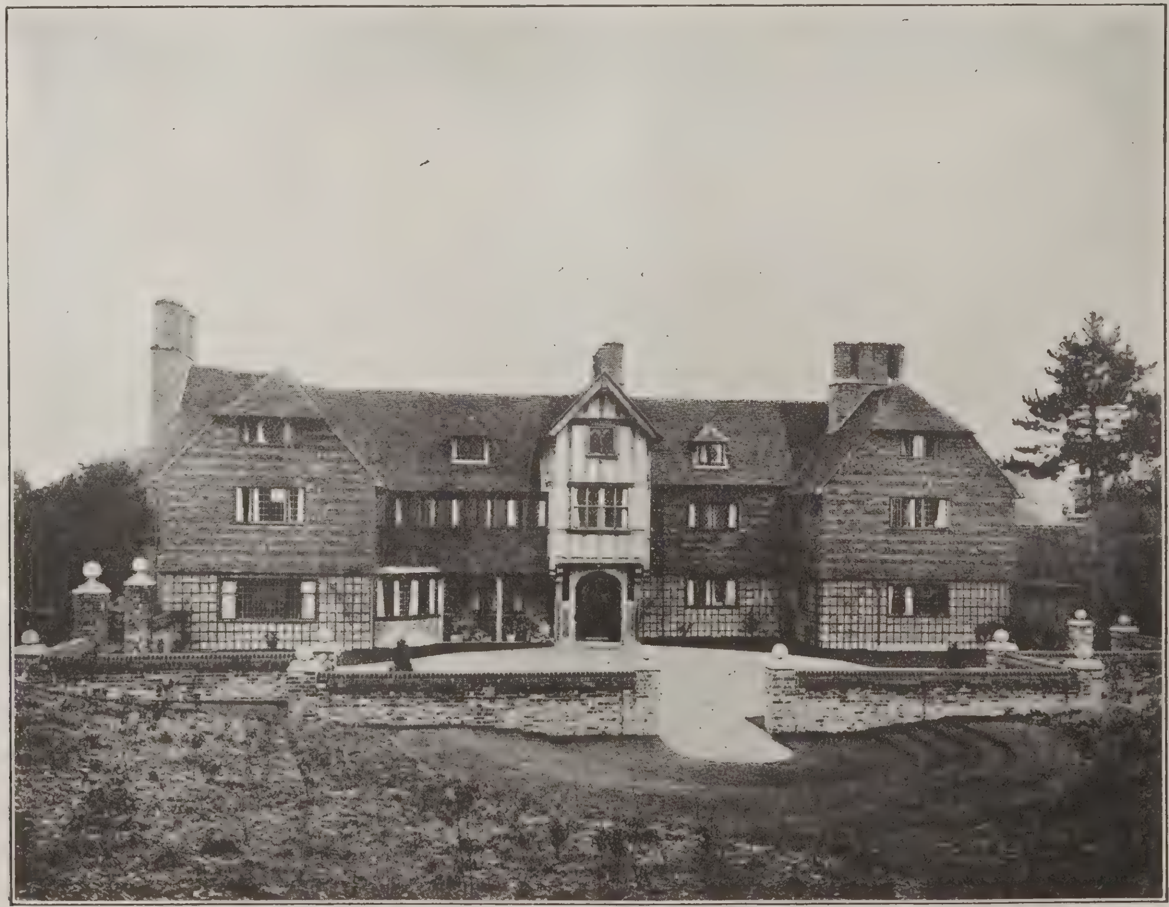
(To be concluded.)

PAINT AND ITS APPLICATION TO STRUCTURAL STEEL.*

By Gaston Depierres.

(Continued from page 527.)

Mr. Davidson said he should like to remark about the imperviousness of the paint, as he thought that this characteristic was perhaps as important as the quality of the pigment. Linseed oil in his opinion was by no means impervious to moisture. He had been informed that if a dried linseed oil film was put into water it would be found that in an hour and a half the water had assumed a somewhat cloudy appearance, and if the film was taken out and examined under the microscope, it would show distinct globules of water. There were other oils on



UPTON GREY, HANTS. GENERAL VIEW OF ENTRANCE FRONT. ERNEST NEWTON, F.R.I.B.A., ARCHITECT.

This was an old farm-house, but very little of the original work remains except the chimneys and some portions of the half-timber work.

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*Abstract of concluding portion of discussion on paper read by Mr. Gaston Depierres at a meeting of the Paint and Varnish Society. Other abstracts have appeared in the issue for April 7, p. 301, and that of June 2, p. 526

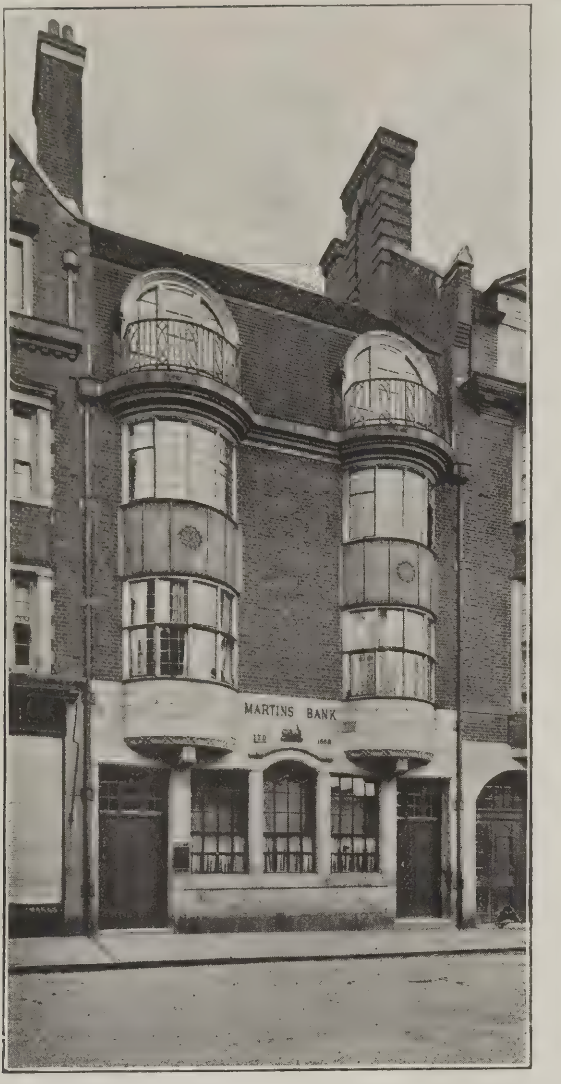


Photo: Architectural Review Photo Bureau

MARTIN'S BANK, BROMLEY, KENT. ERNEST NEWTON, F.R.I.B.A., ARCHITECT.

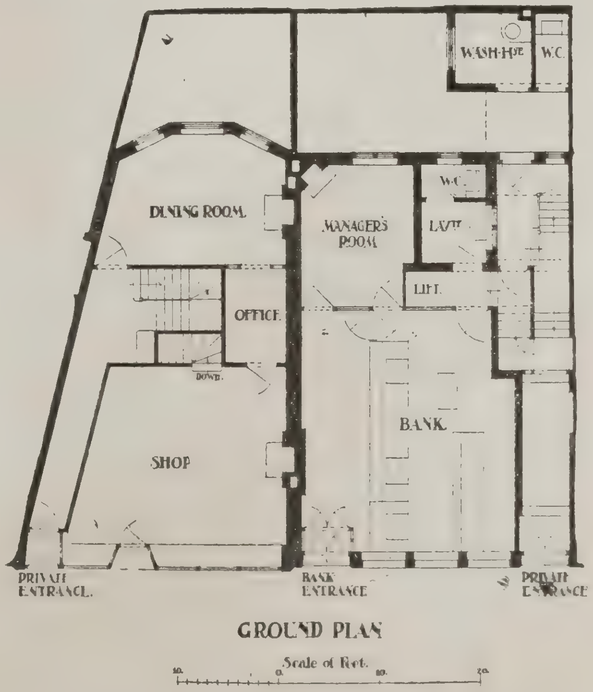
The ground floor is faced with plain unpolished granite, the upper part with red bricks. The spaces between the bays are covered with cast lead; in the centre of each space is an enriched panel with monogram painted and gilded. The cornice is of wood, and the roofs are covered with dark red hand-made Wrotham tiles. Mr. Newton also designed the shop on the left-hand side of the bank, and supplied sketches for the front of the Bell Hotel on the right-hand side, but had no control over the latter work in detail.

the market which were capable, when properly used, of making a paint which would yield much better results for steel and iron than did linseed oil paints.

Mr. J. Russell Thornbery asked whether it was not a fact that red oxides would absorb moisture more rapidly than the harder oxides of iron and the magnetic oxides? Another point which occurred to him was that some suggestions were made by experts that were very difficult of being carried out in actual work. What had to be done was to find some means of applying a paint under practical conditions, and to use a paint of a suitable nature for the work. The suggestion that the paint should be kept in hot-water baths during application was not in his opinion practicable when one considered the conditions under which paints had often to be applied. With regard to painting during moisture and condensation forming on metal, he might mention a case which had come under his notice in that connection. A ship, having been painted, started on her voyage, and after getting into the Gulf Stream the whole of the paint simply slipped off. On careful examination as to the cause of this occurrence, it was found that the ship had been painted during a frost, the whole of the metal being covered with a coat of ice when the paint was applied, consequently it only needed a warmer temperature for the foundation to thaw, and the ship simply shed its coat. The conditions under which contract work was often executed made painting a very difficult undertaking, and the life of the paint manufacturer oftentimes a very sad one. Paints specially prepared for specific work were specified by engineers; the contracts were let and sub-let, and the painting was often pushed off to the last minute, so that it was impossible to expect a satisfactory job. But if anything went wrong it was the paintmaker who got the blame. He thought that great attention ought to be paid by engineers to the workpeople who were employed to do painting work. It seemed to be a prevalent idea that anybody was able to do painting work, and, in fact, till quite recently any paint was considered good enough. They might have the best material to suit certain purposes, but what the paintmaker could not do was to make paint foolproof. On examining so-called empty packages returned to them, the manufacturers often found half the contents at the bottom of the keg, and this was only one of many points which went to show the need for practical painters.

Mr. R. C. Bussell said that Mr. Depierres had mentioned in his paper that if he was given a specification it was the duty of any intelligent paint maker to endeavour to live up to it. In connection with that remark, and rising out of the remarks of the last speaker, the following seemed to him to be typical of the specification which would be drawn up by the average painter:—A paint that does not want stirring; to be applied by a casual labourer at night, in a fog, on a wet surface; a paint free under the brush which will dry hard at once with an elastic enamel surface, and remain so for ever.

Mr. Jennings said he would like to hear from the lecturer whether he considered natural graphite, which was practically pure, was more productive when made into paint than one which was mixed with, say, 50 per cent. of a material such as silica. With regard to imbedding iron in cement, during the last two years he had made some experiments with Portland cement as a protective paint for iron, and he thought that such a paint, if mixed with casein or a material of that nature, would make an excellent protective paint for iron. He thought Mr. Oliver's remarks as to results recorded by the Architectural Association showed conclusively that iron, when imbedded in Portland cement, did not rust. Regarding Mr. McIntosh's remarks as to opposite results being obtained in America, these results were probably due to the fact that in America very little Portland cement was used, and other cements did not seem so satisfactory for the purpose in question. He thought



MARTIN'S BANK AND SHOP PREMISES, BROMLEY.
ERNEST NEWTON, F.R.I.B.A., ARCHITECT.

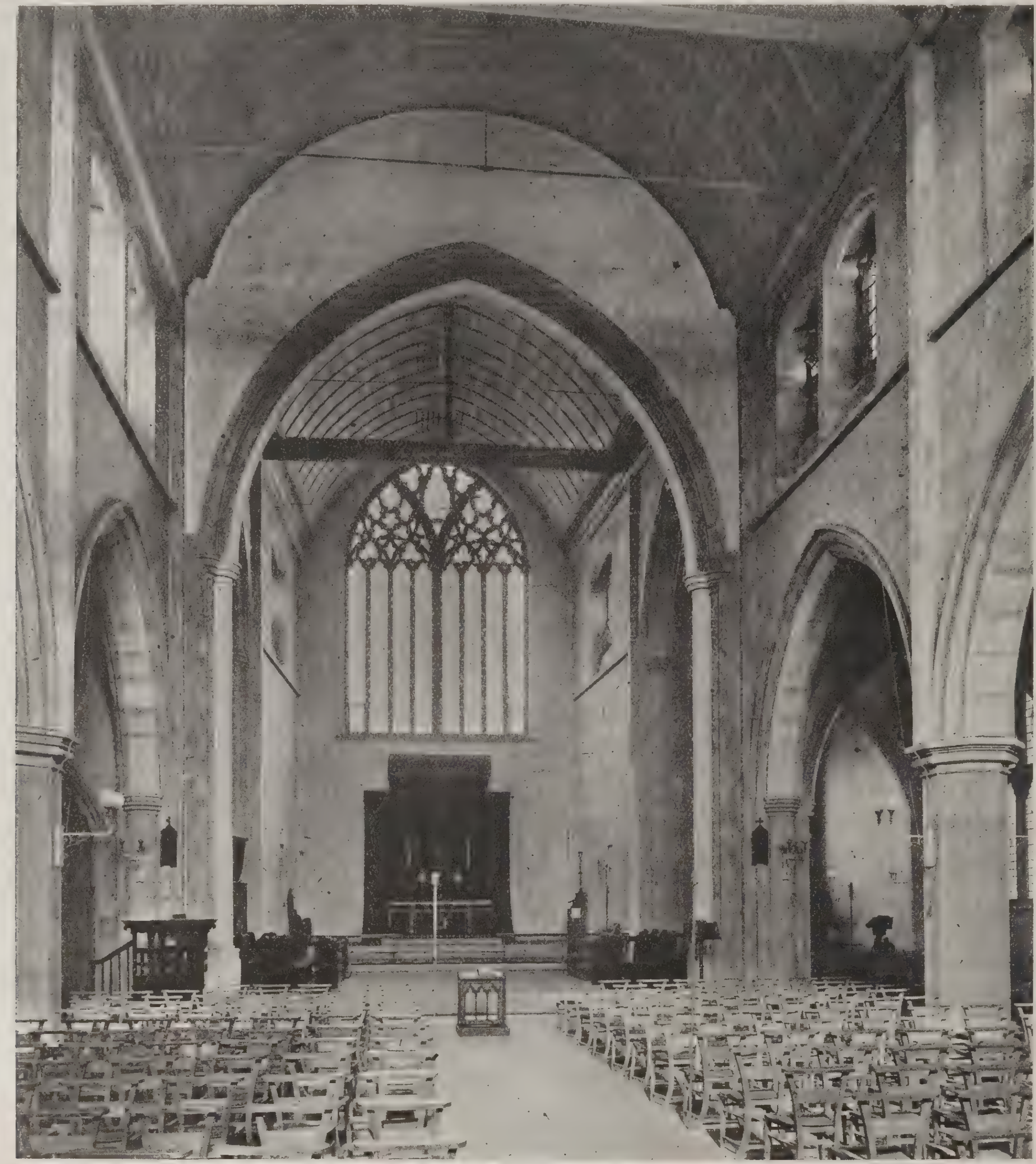


Photo: Architectural Review Photo Bureau.

ST. SWITHIN'S CHURCH, HITHER GREEN, LONDON, S.E. INTERIOR, LOOKING EAST. ERNEST NEWTON, F.R.I.B.A., ARCHITECT.

The nave and aisles of this church were built in 1892, and the chancel and transepts were added in 1903. The exterior is faced with Wrotham bricks and dressings of Box Ground Bath stone, all the exterior stone being whitewashed when finished. The roofs are covered with green slates. Internally the church has barrel ceilings, and the plaster is left rough-faced. The chancel floor is temporarily paved with red tiles; the altar hangings, stalls, etc., are also temporary.

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there was a great future for a protective paint made from Portland cement.

Mr. Davis thanked Mr. Depierres for his very excellent paper, which had been very beneficial to him, and he thought it was particularly interesting just at this time, when so much steel was being used in building construction. He should like to suggest that this excellent and practical paper should be sent to a journal which was widely read by architects and engineers, as he felt sure it would be well received by members of the architectural profession.

In closing the discussion, Mr. Cruickshank Smith said that he should like to focus the attention of the Society in connection with this question of corrosion on two or three salient points. In the first place, it had been abundantly proved that linseed oil was a medium which, when in the form of a dried film, was permeable to moisture. That was a point which the paint maker and the paint user would do well to thoroughly realise. Secondly, Mr. Depierres only referred cursorily to a very important point, namely, the electrolytic theory in regard to the formation of rust. This theory was first of all brought forward by Wightman, and had now been elaborated by Dr. Cushman, of the Agricultural Department of the U.S. Government at Washington. Cushman had investigated the results both of Moody and his collaborators, and Dunstan and his collaborators, and had come to the conclusion that their results were only partially true, and he had elaborated a theory of his own based on electrolytic action. Cushman's investigation and experiments had brought about some very curious results in regard to pigments. When certain pigments were applied to iron, and exposed to influences which would under normal conditions induce corrosion, it was found that some of them retarded or even prevented corrosion. Cushman had therefore divided pigments into three classes, namely, inhibitors or preventors of corrosion, stimulators of corrosion, and indeterminates, the latter class including those which, according to the present observations, neither stimulated nor prevented corrosion. Thirdly, he thought they had heard from all the speakers sufficient to indicate that neither the paint maker working by himself, nor the paint user working by himself, was likely to arrive at a satisfactory solution of all the problems connected with the prevention of corrosion and the preparation of a satisfactory protective paint. It required the skill and technical knowledge of both the scientific manufacturer and the practical user to elucidate the problem, and he considered that it lay within the province of that Society to bring together the trained skill of both sides of the industry in order to see whether they could not advance the present fund of technical knowledge, and so help to bring about a solution of the difficulties that beset this question.

Mr. Depierres, in replying, said that with regard to Mr. Robertson's query in connection with oxide of iron, there were, of course, many grades and kinds of oxides of iron. Based on the electrolytic theory, magnetic oxide of iron has often been recommended as an inhibitor of rust, but, personally, he had been unable to find any advantage over the anhydrous ferric oxide. With regard to Mr. Robertson's query as to the existence of natural magnetic oxide, it is said that a ferric oxide is found in nature having magnetic properties, and of a light red colour, but it has never been offered on the market commercially. He could not agree that artificial oxide of iron was better than natural oxide.

Correspondence.

[The Editor declines responsibility for the statements made by correspondents.]

To the Editor of The Builders' Journal.

Sir,—In my previous communication on concrete bridges (three-hinged types) which you kindly inserted in your issue of May 26th, I mentioned that the Dusseldorf Exhibition bridge was eventually destroyed by means of strong explosives. May I now supplement the information given in the previous number with a brief account of the method of destruction as carried out by the contractors for the removal? The bridge was completely stripped down to the arch ring, wedge-shaped sections were cut out on each side at about 3 metres from the springing, approximately 1.25 metres in from each face, thus leaving about 6⅓ metres of arch ring, which was then drilled for 10 charges on a radial line, 60 centimetres in from the back or extrados, there being on the intrados the tension cracks from the test loading carried out previous by the German engineers. By the explosion of these 10 charges simultaneously at each hole, conical portions of concrete were blown out, and the neighbouring or surrounding portions were somewhat loosened without effecting the desired downfall. Then the workmen with hammer and chisel attacked the remaining sound portions, till only 1.7 metres remained, which was then blasted with three more charges, thus completely effecting the downfall of a somewhat remarkable structure. This bridge was a pure concrete bridge, no reinforcement being used at all in the arch ring. At the same time a side wall, partly supporting an 8-metre span reinforced concrete floor, was blown down, leaving the floor suspended in mid-air, thus acting as a somewhat wide cantilever, which was still used as a runway for loaded barrows, and workmen passing over same in complete safety till it was eventually demolished. Then, again, when 10 charges were exploded in an 8-metre wider floor, with beams carrying same (T-beam section), the result was not total destruction, but the expected conical hole formation with radiating cracks from the hole outwards, thus proving how tenacious the construction was. Herr Ducker and Co. were the contractors for the removal of the exhibition buildings devoted to concrete and cement.

These few particulars are given in the hope that they will counteract in some way or other the published reports of reinforced concrete failures, as given by papers with little or no knowledge of the subject. In conclusion, I would like to state that Herr Dyckerhoff gives the time increment of strength in a table published by him as follows: Amongst others a 1.6.10 mixture in kg/qcm. (kilogrammes per square centimetre) gave at 7 months 121 kg/qcm., at 1 year 165 kg/qcm., at 10 years 233 kg/qcm. Thus it will be seen the strength has increased nearly double that at 7 months. What would it be in 100 years assuming this rate of increase?

James Smyth.

THE LONDON COUNTY COUNCIL.

The London County Council, at its meeting yesterday (Tuesday), had under consideration the following recommendations (with others). In each case consent was advised by the Building Act Committee :—

Erection of buildings on the western side of Church Street, Chelsea, between King's Road and Elm Park Road, on the application of Mr. C. W. Stephens, on behalf of the Vale Estate Company, Limited.

Erection of buildings on the eastern side of Stamford Hill, Hackney, to abut also upon the southern side of Upper Clapton Road, on the application of Edmondsons, Ltd.

Erection of a building at No. 230, Lavender Hill, Battersea, with a one-storey shop in front, on the application of Mr. A. Whitelaw, on behalf of the London and North-Western Railway Company.

Erection of a building at the rear of the German Sailor's Home, West India Dock Road, and Rich Street, Limehouse, to abut upon Beccles Street, on the application of Mr. G. Waymouth.

Erection of a building on the site of No. 7, Fort Street, Stepney, on the application of Mr. F. Fox.

Rebuilding of the "Navy Arms" public-house on the eastern side of New King Street, Deptford, abutting also upon the southern side of Prince Street, on the application of Messrs. Wylson and Long, on behalf of Truman, Hanbury, Buxton and Co., Limited.

Formation of a new street for carriage traffic to lead from Tothill Street to Princes Street, Westminster, on the application of Drivers, Jonas and Co.

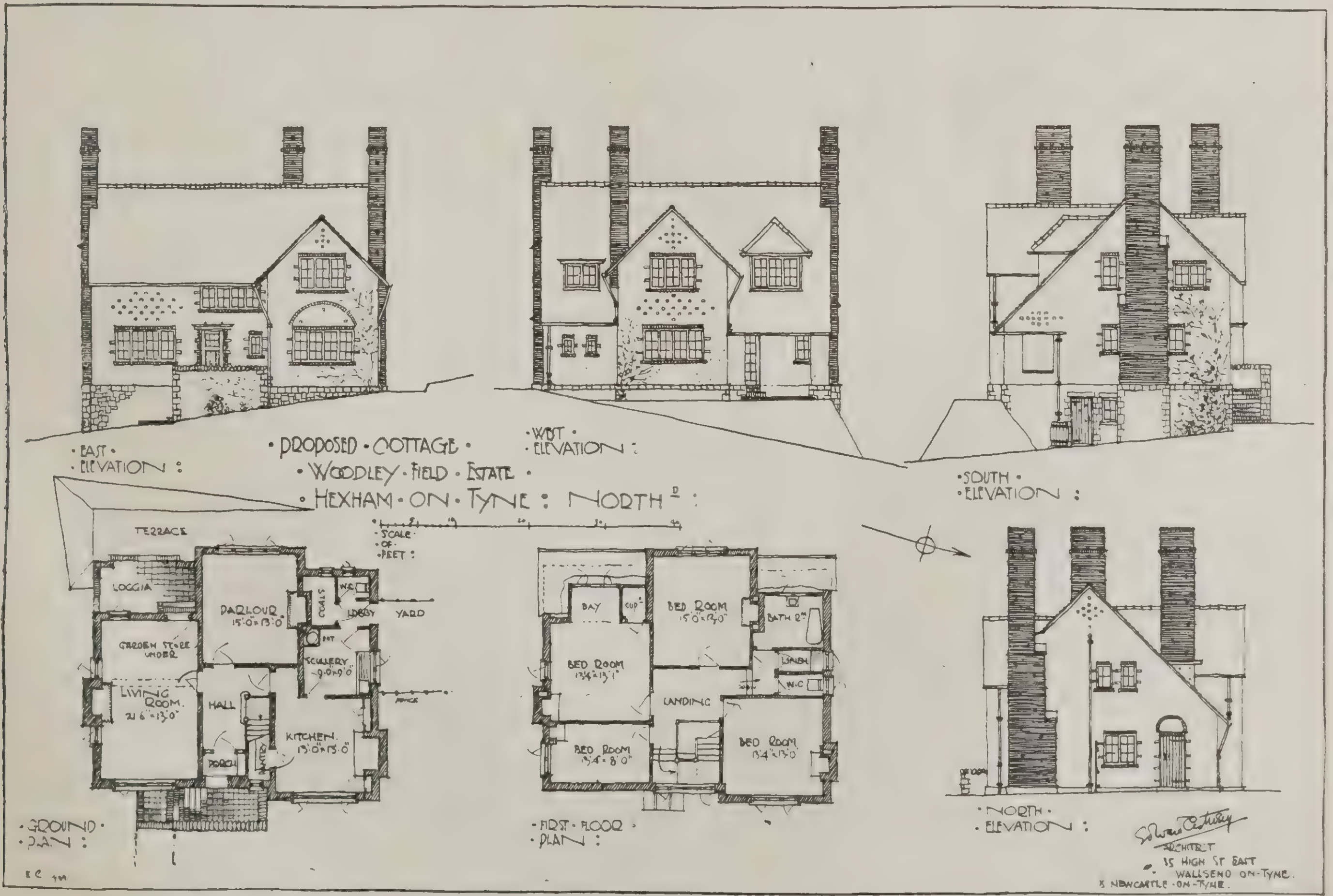
Erection of rooms upon the flat roofs of three buildings known as Sussex Mansions, Old Brompton Road, Kensington, on the application of Mr. W. H. Collbran.

Federation News.

LONDON MASTER BUILDERS' ASSOCIATION.

Secretary: T. Costigan.

The following fixtures for July were arranged:—Last Thursday, special Council meeting, 4 p.m.; Thursday, 15th, Council meeting, 4 p.m.; Organisation Committee meeting, 2.30 p.m. Meetings of the Institute of Builders, and of the Builders' Benevolent Institution, were announced under "Coming Events."



COTTAGE AT HEXHAM. EDWARD CRATNEY, ARCHITECT.

This cottage is now in course of erection, and is the first of a series of cottages to be erected on the Woodley Field Estate at Hexham. The walls are built of rubble up to the ground floor level and 11 inch brickwork above, rough casted with two coats Portland cement and dashed with white Derbyshire spar. The roof will be covered with red pantiles, and the windows will be wood casements opening outwards. The floor of the Loggia and the landing and steps at front entrance will be of brick on edge-set in squares. The contractor for this cottage is Mr. James I. Murray of Hexham, and the architect, Mr. Edward Cratney of Wallsend and Newcastle, who is also responsible for the laying out of the estate.

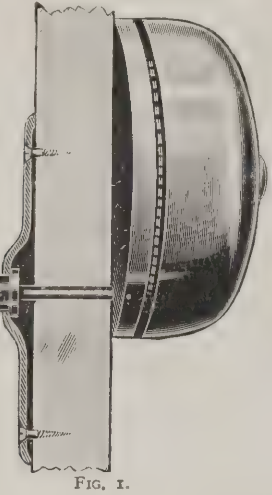


Fig. 1.

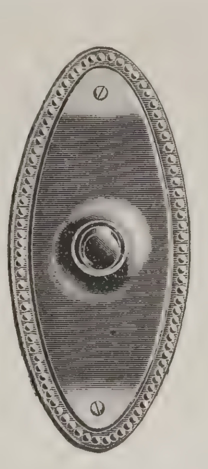


Fig. 2.

"NEW DEPARTURE" DOOR BELLS AND GONGS

Trade and Craft.

"New Departure" Bells or Gongs.

The ingeniously contrived clockwork bells or gongs introduced into this country from America several years ago have become very popular for various services, especially for the front doors of suburban houses. "All the latest modern conveniences," in small houses, are apt to include an exceedingly fragile electric installation, in which wires, bells, and batteries are, singly or in unison, so constantly out of order as to constitute a nuisance rather than a convenience. The "New Departure" door gong, as the writer happens to know from personal experience, completely relieves the householder of this threefold source of worry and vexation. It offers, as its vendors claim, "electric results without a battery." Very slight pressure on a button causes the gong to sound for as long as the button is held. There are gongs in which the necessary force to operate the striking mechanism must be applied direct. In the "New Departure" gong, however, the operating force is stored up in a clock-spring, and is released with a light touch on the button. The mechanism is wound up by simply turning the gong. Beyond doing this four or five times in the course of a year—and the winding takes but a few seconds—the apparatus requires no attention whatever. The writer has had one in use on a hard-worked front-door for about five years, and it has never given the slightest trouble. The fixing could hardly be more simple. There is nothing to do beyond boring a hole to take the push-wire between the clockwork on the inner side of the door and the button on the outer, and to screw the mechanism and the door-plate into their respective positions. The whole operation can be performed in about ten minutes. The sectional illustration (Fig. 1) shows the whole process at a glance. Fig. 2 illustrates one of the door-plates, of which there are many different patterns, plain and ornamental, in brass or bronze finish. There are also several types of apparatus, all, however, acting on the same principle, which is adapted to various requirements. A thumb-piece, turning both left and right, may be adopted instead of the push-button. By a simple arrangement of cranks, the gong can be actuated from a distance—as from front-door to kitchen, or from the inside of a carriage to the coachman's seat. The apparatus is also mounted on various kinds of stands, to form call-bells for tea-rooms, offices, etc., and there is a special arrangement producing an effective alarum for automobiles. A new and much cheaper model of door-bell is of the push-button (clockwork) pattern, and has a stamped dome and finger-plate instead of the cast dome and plate of the regular patterns. It will no doubt be largely used for the cheaper classes of dwellings. Messrs. John H. Graham and Co., 118-122, Holborn, London, E.C., are the agents in this country.

Messrs. Veritys' Electrical Supplies Catalogue.

Veritys, Ltd., electrical manufacturers, whose works are at Aston, Birmingham, and who have sale depôts in London, Birmingham, Bristol, Manchester, Liverpool, Newcastle, Glasgow, and Dublin, besides export offices at 31, King Street, Covent Garden, London, W.C., have found that, with the growth of the electrical industry, the wholesale catalogue in one huge volume has become too cumbersome for convenient service. Accordingly, the firm divided their catalogue into two volumes, one dealing with the heavier apparatus and supplies, the other with fittings. They have now carried subdivision a step further, dividing the catalogue into three volumes, which are of handy and portable size, and are strongly bound, while the paper, printing, and illustrations are wholly admirable. Such handsome books are pleasant to handle and to look upon; and the neat and durable case in which they are enclosed is a further concession to sightliness and convenience.

The first volume includes articles that Messrs. Verity do not manufacture, such as steam and gas engines and other prime movers, as well as pulleys and belting, etc., etc.

Boilers of all kinds—Cornish, Lancashire, and water-tubes, horizontal and vertical—are listed, as well as various types of engines and generators; suction gas plant and engines being of course included.

The second volume of the catalogue is labelled "sundries," and comprises sections on accessories; cables, conduits, and installation sundries; bells, bell material, and telephones and sundries; heating and cooking; and signs, illumination, and theatre apparatus. It enumerates all the minor requirements and details of electric installation.

The third volume shows a varied and comprehensive collection of fittings. The architect or decorator will here find ready to his hand designs that are applicable to nearly all the circumstances with which he is called upon to deal; but Messrs. Verity announce that they are always pleased to submit special designs and to arrange for draughtsmen's visits free of charge. In many respects this volume is more than a mere catalogue; it is by way of being a treasury of art—a fact for which one should be truly grateful, considering the extent to which electricity, having become an indispensable adjunct to the modern building, must now influence and modify, for good or ill, the decorative schemes of architects, builders, and decorators. At Aston, Birmingham, Messrs. Veritys have built up a great industry, employing, we believe, more than 800 persons; and it is indeed gratifying to observe, from evidence gathered on the spot, as well as from that which abounds in this excellent tripartite catalogue, that genuine art-craftsmanship is here so closely associated with sheer utility as to seem almost inseparable from it.

ROBERT
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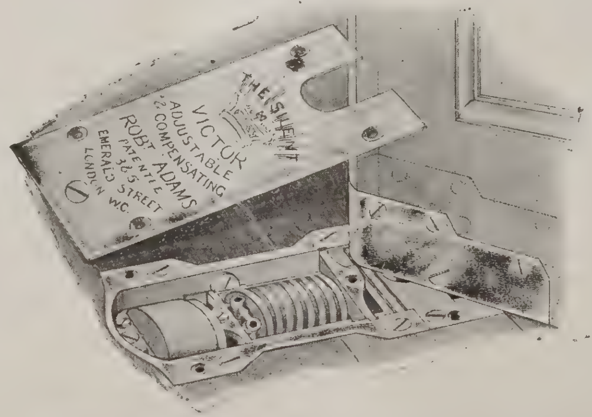

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Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Abercarn (Mon).—For Sunday school premises in connection with the Garn Congregational Church, Abercarn. Mr. R. L. Roberts, M.S.A., architect, Abercarn:—

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A. and J. Richards, Griffithstown	1,980	0	0
S. Edwards, Newbridge, Mon	1,978	0	0
G. F. Leadbetter	1,930	0	0
E. F. King and Co.	1,908	0	0
J. Jenkins, Ltd.	1,897	0	0
J. E. Jones, Abercarn	1,884	0	0
W. and D. Thomas, Ynysddu, Mon.	1,867	10	6
A. J. Colborne,* Swindon	1,745	0	0

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	£	s.	d.
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F. L. Honess	3,484	0	0
A. E. Taylor	3,170	0	0
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J. Gregory	3,110	0	0
D. Godden and Son	3,065	0	0
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E. W. Jacobs	3,024	10	0
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Simpson and Watson, Hemsworth	4,143	15	11
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W. H. Dews and Co., Leeds	3,768	0	0
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(*Tenders continued on page viii.*)

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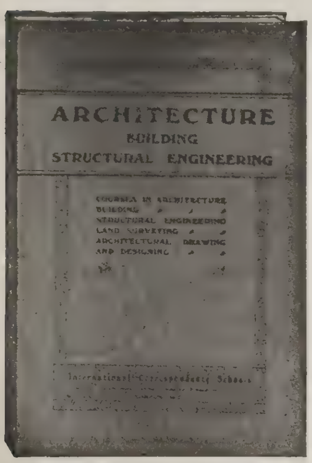

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Littlehampton.—For erecting and completing a shelter hall on the green at Littlehampton, for the Littlehampton Urban District Council. Mr. H. Howard, M.S.A., surveyor:—

E. Hill	£1,576	17	0
T. Smith	1,490	0	0
Hockley and Co., Brighton ...	1,476	0	0
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Surveyor's estimate, £1,500.

*Accepted

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D. Davies and Son, Cardiff ...	3,550	0	0
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W. Williams, Cardiff	3,380	0	0
D. W. Davies, Cardiff	3,373	9	7
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*Accepted.

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*Withdrawn, an amended tender being too late.

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Thomas and Edge, Woolwich ...	12,896	0	0
Spencer, Santo and Co., Ltd., Kensington High Street ...	12,746	0	0
Perry and Co. (Bow), Ltd. Bow	12,570	0	0
F. and E. Davey, Ltd., Southend-on-Sea	12,155	0	0
W. Harris, N. Woolwich ...	12,137	0	0
Patman and Fotheringham, Ltd., Islington	£11,0[illegible]	0	0
A. E. Symes, Stratford	11,906	0	0
J. and C. Bowyer, Ltd., Upper Norwood	11,728	0	0
F. and T. Thorne, Isle of Dogs	11,627	0	0
E. Lawrence and Sons, Wharf Road, City Road	11,332	0	0
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London.—For improvements at York Road School, Islington, for the London County Council:—

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J. Marsland and Sons, Walworth	11,364	19	4
McCormick and Sons, Northampton Street, Essex Road ...	10,987	0	0
G. S. S. Williams and Son, Richmond Street, Thornhill Square	10,960	0	0
Treasure and Son, Ltd., Holloway	10,930	0	0
G. E Wallis and Sons, Ltd., Albemarle Street	10,889	0	0
W. Downs, Walworth	10,828	0	0
J. and M. Patrick, Wandsworth	10,669	0	0
Lole and Co., Chelsea	10,519	0	0
Patman and Fotheringham, Ltd., Islington	10,486	0	0
McLaughlin and Harvey, Ltd., 13, Brecknock Road	10,418	12	3
C. F. Kearley, 4, Great Marlborough Street	10,261	0	0
L. H. and R. Roberts, Islington	10,234	0	0
G. Godson and Sons, Kilburn Lane	10,221	0	0
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Matlock and Parsons	5,677
A. Porter	5,674
Pattinson and Law	5,610
Appleby and Sons	5,593
A. Munk, Edmonton	5,550
Davey, Southend	5,507
Maddison	5,486
Nightingale	5,428
Webster	5,395
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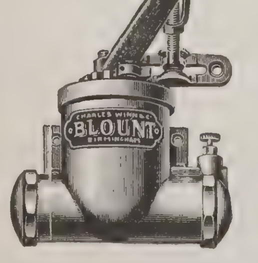

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AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

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A National Science Museum. The deputation of British men of science which, headed by Sir Henry Roscoe, waited upon Mr. Walter Runciman, President of the Board of Education, to present a memorial urging the desirability of providing a special building to accommodate the national science collections at South Kensington, presented a good case in convincing style, and received an encouraging reply. No other response was possible. Mr. Runciman was even constrained to say that he was ashamed of the present position, and he was perhaps prompted to that confession by the remark of Sir Hugh Bell, President of the Iron and Steel Institute, that one's national pride was hurt on going through a building at South Kensington which, erected fifty years ago as a refreshment room, is now found to be inconveniently crowded with what ought to be a very interesting collection showing the application of science to industry. The incompleteness of the collections is easily understood. People are reluctant to give or lend objects that, for want of a suitable building, cannot be properly seen, and are not, as they should be, as thoroughly protected from fire dangers as the latest developments of building construction would ensure. Consequently the collections do not increase as they ought; and it is but "Job's comfort" to reflect that there is really no room for expansion. Room must be made; and Mr. Runciman's gloomy observations as to the difficulty of obtaining a suitable site and the necessary funds, were anticipated in Sir Henry Roscoe's statement that land sufficient for the purpose is in the Government's hands; while the Royal Commissioners of the 1851 Exhibition offered, as long ago as 1876, to contribute £100,000 towards the proper housing of the collection. As Mr. Runciman promised to urge upon his colleagues of the Cabinet the importance of the subject, the prospect of seeing the new Museum of National Science in three dimensions before the century is much older does not appear to be hopelessly remote.

Cynicism or Despair. The amendment of the London Building Acts bringing them more up to date with regard to what is conveniently if somewhat inaccurately called "steel construction" is now virtually through the Parliamentary Committees. It has been decided that there shall be inspection of internal construction. This may tend to safety; but will certainly not tend to expedition, and the decision is greatly disappointing to architects, whose misgivings on this point are rather accentuated by the decidedly odd provision that appeal shall be referred to the police magistrate, who of all men is probably the one who is least qualified to deal with such matters. Obviously, he has neither the time nor the requisite technical knowledge for such matters; and, from every point of view, the police-court seems to be about the worst conceivable tribunal of appeal. There is one characteristic of the police magistrate, however, that affords a glimmering of hope. He is often amply furnished with strong common sense, native or acquired; and the chances are that he will at once perceive the impossibility of bearing the fresh burden that has been so inconsiderately imposed upon him, and will take prompt and strong measures to get rid of it. Reference to the police magistrate is perhaps not necessarily degrading, but it is certainly farcical, and one cannot help wondering whether this inept solution of an admittedly difficult problem was prompted by cynicism or by sheer desperation.

The Dullest Spot. How undecorative a people we are is signified in an appalling instance cited by "A Country Cousin," who writes to the daily Press to accuse the faithful Commons of maintaining the arid barrenness of "one of the dullest spots in the Three Kingdoms." Curiously enough, he (or she) applies this description not to the legislative chamber, but to the Terrace, which "stretches its gloomy expanse of pavement and its ugly parapet [shade of Barry!] devoid of all colour except such as occasional saucers of ripe strawberries foreshadowing guests may supply." It is suggested that a geranium or two, or the contents of a coster's flower-barrow would work a magical change without seriously affecting the supply of Dreadnoughts. This might possibly have commended itself to the lieges as a reasonable proposition; but unfortunately the correspondent lapses into poetry, lilting light-heartedly of "shrubs in painted tubs," and thus destroying, at once and for ever, all claim to attention from the dignified makers of our laws, whose minds are moulded to the severely Gothic lines of the building they adorn but do not decorate. Let the Terrace continue unbedizened, for in that blessed condition it fulfils a cardinal condition of good architecture—that the exterior of a building should express its character. What could be more appropriate than that the Terrace should remain "one of the dullest spots in the Three Kingdoms," seeing its entire relevancy to the dreariest spot on earth—the floor of the House?

St. Paul's Bridge. The proposal to build a new bridge over the Thames raises mingled hopes and misgivings. Will it be purely an engineer's production, or will it be a miserable compromise as between the engineer and the architect, the former constructing the skeleton, and the latter clothing it with more or less inappropriate ornamentation? Or will the Corporation take courage and have the bridge constructed of reinforced concrete. It should, in any case, be more than merely utilitarian—it should reflect somewhat of the dignity of London, and should both signalise and encourage that growing sense of beauty which is said to be in course of rapid development among its citizens. Here is a splendid opportunity of showing that we have lived down our old reputation of being merely a nation of shopkeepers, and that we have acquired some considerable regard for art and architecture—a polite assumption that would probably be negatived by those who are inclined to see in this very scheme a strong disproof or disclaimer of it. Among these may perhaps be counted a gentleman who has written to the daily Press to protest against the choice of a route which will bring the enormous traffic of a new "main artery" right under the walls of St. Paul's Cathedral. It has been frequently deplored, mainly by foreign observers, that grave injustice is done to St. Paul's Cathedral by allowing it to be closely hemmed in by warehouses, instead of surrounding it with wide-spreading greenswards; and it does seem a pity that there should be any danger of getting still farther away from that glorious but utterly unattainable ideal. The critic's more effective appeal is that which is the more likely to awaken panic fears: "A good deal was said about the new sewer through London endangering the foundations of the cathedral; but what would that damage be, compared with the damage arising from the construction of this subway, and from the constant running therein night and day of heavy tramcars?"—a feature of the scheme being, as we recently recorded, the construction of a subway for tramways running between the northern approach to the bridge at Cannon Street, and Aldersgate Street. A strong objection to the surface-level route is that it will cross, at very short intervals, two crowded main thoroughfares—Cannon Street and Cheapside—and, by adding to the confusion and congestion, will do more harm than good. The critic is in favour of abandoning the St. Paul's Bridge scheme, and of spending the money on a thorough improvement of Southwark Bridge and its approaches. He seizes hold of an expression to the effect that the expense of interfering with certain property in order to effect improved traffic accommodation would be "almost prohibitive." Some of the present congestion in this very neighbourhood, he points out, is due to the adoption of that argument on a former occasion when a great street improvement was planned. "When Queen Victoria Street was constructed, it was made a thoroughfare 65ft. in width, but the authorities were not prepared to do the thing thoroughly, and left an old street only 50ft. wide to form part of this new highway, so that the public has never had the full benefit of the expenditure on this improvement. At the Mansion House Station there is, in fact, a 'bottle-neck,' the effect of which is to make the extra 15ft. in width further down of no real value at all." This, surely, is a sufficiently striking illustration of the folly of false economy. A further objection to the new bridge is that if it is built there will then be no fewer than four bridges within a reach of 500 yards, spoiling the appearance of the waterway. Every scheme of any magnitude that was ever broached has been subjected to criticism, carping and otherwise, and most of it supremely negligible. It strikes us, however, that this particular critic has sound reasons for the faith that is in him, and that the authorities have hearkened unto his voice: for the scheme has been "referred back."

The Restorer's Retort. To affirm that the Society for the Protection of Ancient Buildings sometimes allows zeal to outrun discretion is only another way of admitting that it has the defects of its qualities. Its criticisms of the work of restoration now being carried on at Exeter Cathedral have apparently exasperated the local Press. "If," says a writer in the Exeter "Express and Echo," "the Dean and Chapter swept away the old work and substituted something of entirely different design, a strong protest would be in order; but seeing that the new portions are facsimiles of the old, criticism is captious. If the crumbling stones were not replaced, Exeter Cathedral would in course of time become a ruin. Is that what the critics desire? In that event, however, the title of the Society is a misnomer." The writer of this rather scathing rebuke thereupon proceeds to commit the most heinous and most characteristic fault of "the alleged restorer." Not content with destroying the old (title), he substitutes something that is not only new, but altogether obnoxious. The Society, he suggests, should be renamed "The Society for the Creation of Picturesque Ruins." This perhaps goes rather beyond the retort courteous; but perhaps it does not get so far as the countercheck quarrelsome. Let us call it the reproof valiant.

Street-lighting Systems. In order that London may not be the worst lighted city in Europe, the Corporation appointed a deputation to visit important Continental cities and report on the systems in vogue. They found that, as a rule, the main streets are lighted by electric arc lamps, and the side streets by incandescent gas—Brussels, Cologne, Berlin, Dresden, and Vienna all furnishing instances of this dual arrangement. The deputation report in favour of centrally-hung lamps, a system that has been for some time on its trial in Cannon Street and elsewhere. Open spaces, however—by which it is presumed are meant those places whose area is too expansive to admit of the application of the suspensory system—they propose should be lighted by means of lamps upon standards fitted with lowering gear, and that high-pressure inverted incandescent gas lamps should be adopted where practicable. The design of those standards, and of the fittings generally, should not be left to whim or chance. Useful by night, they should be comely if not ornamental by day; and as, when badly chosen, their effect on street architecture may possibly be absolutely revolting, the choice, if not the production, of patterns should be entrusted to competent architects, who will be at least able to ensure effects that are inoffensive. Another point upon which we have repeatedly insisted may be now opportunely urged again—namely, that any system of street lighting falls somewhat short of legitimate expectation if it fails to indicate street names. Finding one's way about London or its suburbs after nightfall ought not to be a matter of "trial and error." A proper system of street lighting and street labelling would relieve policemen and postmen of much extraneous work. But the illuminated labels need not, and must not, be hideous.

Buried Buildings. Diligent and persistent spadework in various parts of the kingdom is yielding rewards that justify the effort. At Caersws, Montgomeryshire, the old Roman camp, a curate, the Rev. D. Davies, attempted a serious exploration as long ago as 1854, when the foundations of a villa and baths were unearthed. The work was then abandoned, and the site was neglected until 1901, when some workmen excavating for the foundations of new houses made some discoveries of pottery, etc., which re-awakened the interest of archæologists. The camp, which is believed to be the largest of the twenty military camps constructed by the Romans in Wales during the second half of the first century, is now being systematically explored by the Liverpool Committee of Excavation and Research in Wales, in conjunction with the Powysland Club, who have found that the large rampart running round the camp was probably about 12ft. high, and that it was made of clay, with red sandstone dressing on the outside. Blocks of dressed sandstone, which must have formed part of an imposing structure, have been discovered, and a fine Roman road—oddly described, in a local report, as "macadamised"—21ft. wide. Excellent work is also being done by the Corbridge Excavation Committee, who have sent us a circular in which an appeal for funds is powerfully supported by an interesting account of what has been already accomplished. It appears that in 1906 the Northumberland County History Committee undertook trial excavations on the Roman site of Corstopitum, which lies a little to the west of the present Corbridge, and found sufficient to justify the supposition that the systematic and scientific uncovering of the site was well worth while. An Excavation Committee of scholarly composition was then formed, and began, in July, 1907, excavations that have been successful almost beyond expectation. The bridge over the Tyne has been traced, and for the first time correctly laid down in the map, the massive construction of its northern approach being laid bare, measured, and figured. A large building, with hypocausts, corridors, water supply, latrines, and (as it seems) an elaborate Bellevue overlooking the valley of the Tyne, has been uncovered. An ornamental water-tank yielded the Corbridge Lion, "the most remarkable piece of Romano-British sculpture yet found in the region of the Roman Wall, and indeed in the whole of Roman Britain." Other discoveries are—a broad street, flanked by substantial buildings; a fine inscribed slab (of about A.D. 140), illustrating the operations that led to the construction of the Wall of Pius from Forth to Clyde; a decorated drinking fountain of perhaps the same date; a pottery store that evidently had been burnt out; two large buttressed granaries, each nearly 100ft. long, faced within and without with "most admirable ashlar," and having mullions to the windows, one of which, remaining *in situ*, is perhaps the oldest mullion in the world; a bas-relief of the Sungod, in fourth-century style, is probably the best preserved sculpture of that age as yet identified in England; and another, of which an illustration is given in the circular, seems to show the myth (rarely depicted in Roman sculpture) of Bellerophon. It were quite superfluous to point out that such discoveries must have a considerable bearing on architectural history, whose roots and rudiments, it would seem, are underground.

Our Royal Academy Ballot.

Our proposal for a ballot with the object of ascertaining the names of those architects who, in the opinion of the profession, are worthy of the honour of election to the Royal Academy (for particulars, see last week's issue, p. 27) is meeting with the most gratifying success. The following list of names indicates the relative positions of twenty nominees, as indicated by the votes recorded up to the first post on Monday last:—

1. Lutyens, E. L., London.
2. George, Ernest, London.
3. Hare, H. T., London.
4. Newton, Ernest, London.
5. Pite, Professor Beresford, London.
6. Burnet, J. J., Glasgow.
7. Collcutt, T. E., London.
   Lorimer, R. S., Edinburgh. } Equal.
   Rickards, E. A., London.
   Stokes, Leonard, London.
11. Dawber, E. Guy, London.
12. Gibson, J. S., London.
   Lethaby, Professor W. R., London. } Eq
14. Caröe, W. D., London. } Equal.
   Flockhart, William, London.
16. Moore, Temple, London.
18. Mallows, C. E., London. } Equal.
17. Lanchester, H. V., London;
   Simpson, John W., London.
19. Brierley, Walter H., York.

It is hardly necessary to state that many other gentlemen have been nominated, and that further voting will no doubt modify the present list. The first round closes to-day.

BARNSLEY'S NEW COUNCIL SCHOOL.

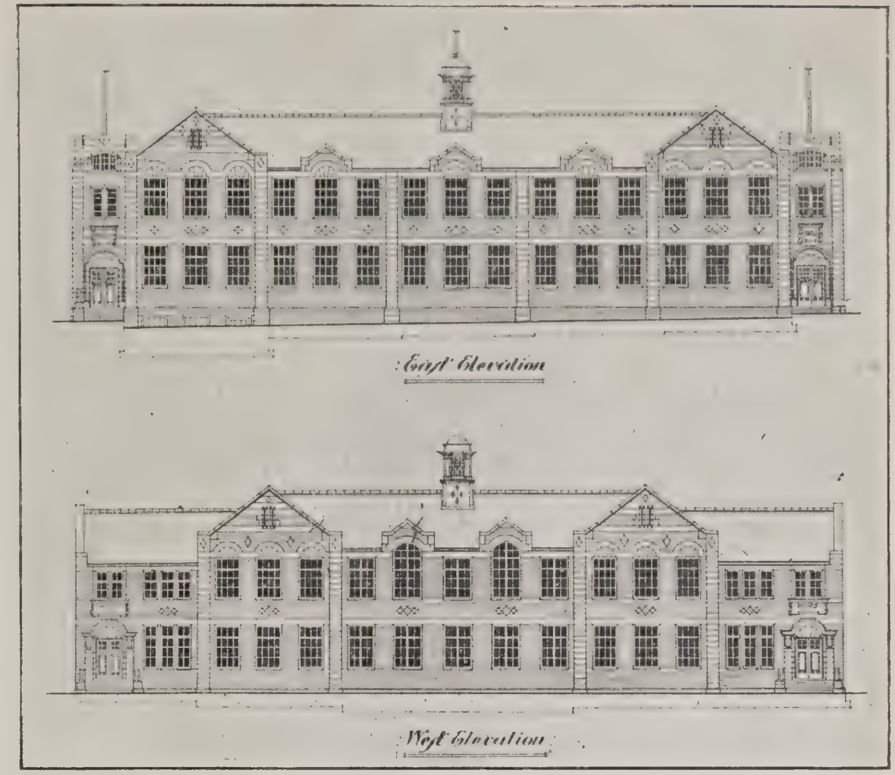
The Barnsley Education Committee invited architects to submit designs for the erection of a school in Grove Street for 900 children, in three departments, Mr. Herbert T. Buckland being selected by the committee to act as assessor.

The premiums offered were £30, £20, and £10, for the designs placed respectively first, second, and third, the premiums, in the case of the architect selected to carry out the work being merged in his commission.

It was stipulated that the drawings submitted should be executed in ink, in black and white (the elevations left unshaded, and no prospective allowed), and should consist of a block plan of the site, drawn to 1-20th in. scale, showing the position of the buildings, playgrounds, drainage, latrines, play-sheds, etc.; a plan of each floor of the three departments, indicating the desk and giving the position of the heating chambers; and longitudinal and transverse sections, and three elevations of the respective buildings—all to ⅛ in. scale.

The cost of the whole, exclusive of furnishing, was limited to £12 per head. Whilst the actual disposition of the buildings on the site was left to the discretion of the competitors, it was suggested in the conditions that it would be desirable "to so arrange the buildings as to leave the greatest possible area of the site free and square, and to give every room used for teaching an aspect which would ensure the admission of direct sunlight during some part of the school hours."

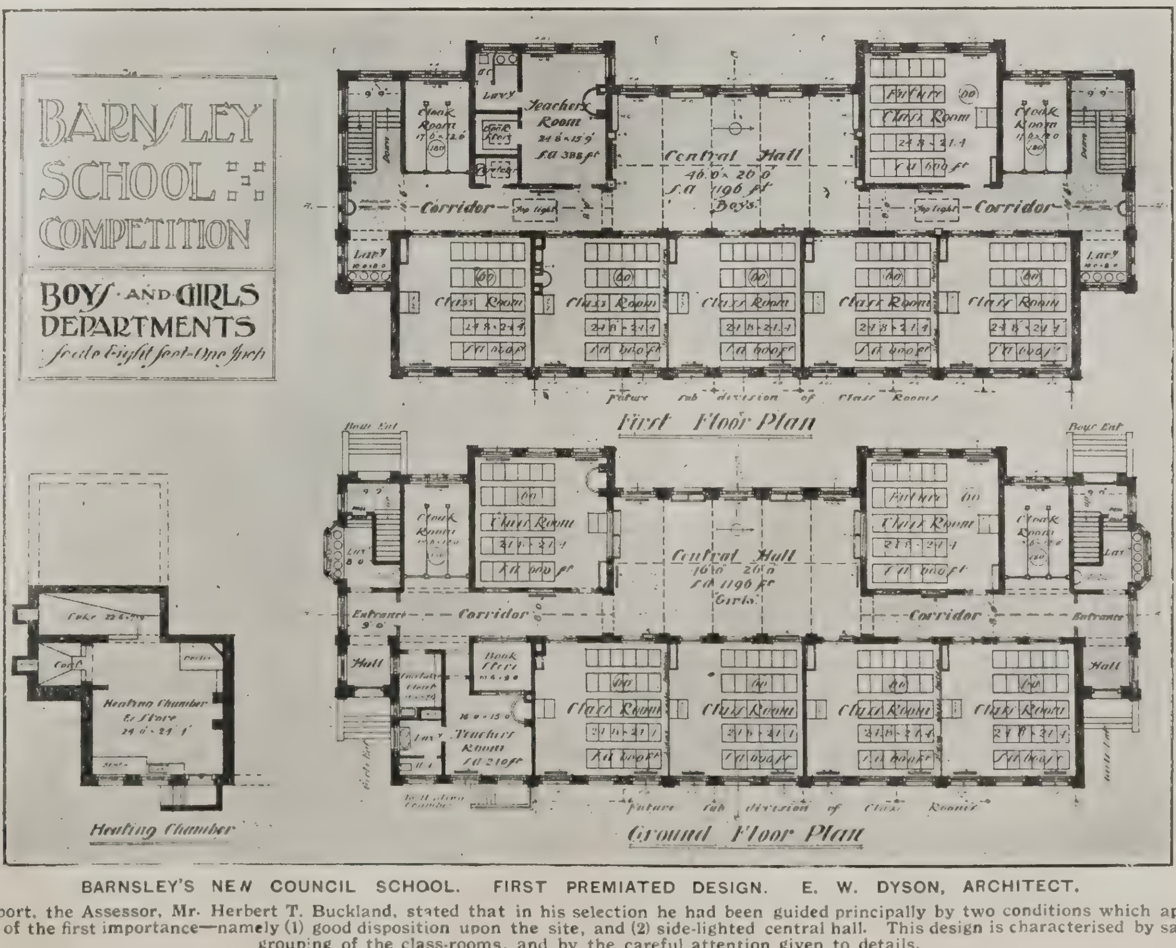
The conditions require the schools to be built in two blocks, to provide accommodation in three separate departments, for 300 boys, 300 girls, and 300 infants; the plans submitted to allow for the possibility of an additional classroom (60 being added to the accommodation of each department—the competing architects being left to determine for themselves which of the two departments it would be most satisfactory to include in the same block.



BARNSLEY'S NEW COUNCIL SCHOOL. FIRST PREMIATED DESIGN.
E. W. DYSON, ARCHITECT.

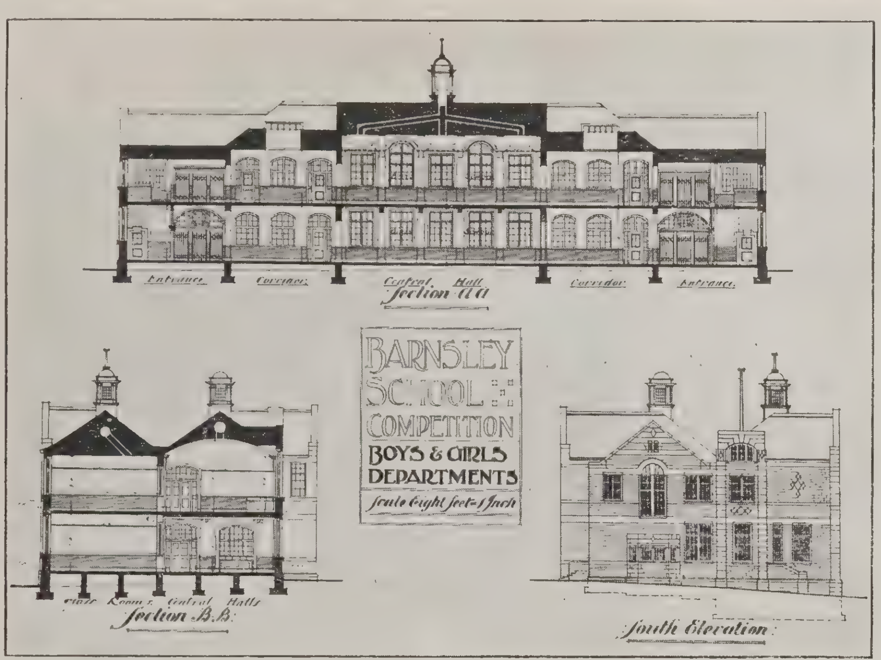
In the elevation of the boys' and girls' block, perfect symmetry is evident, an advantage that has not been obtained at the expense of competent planning.

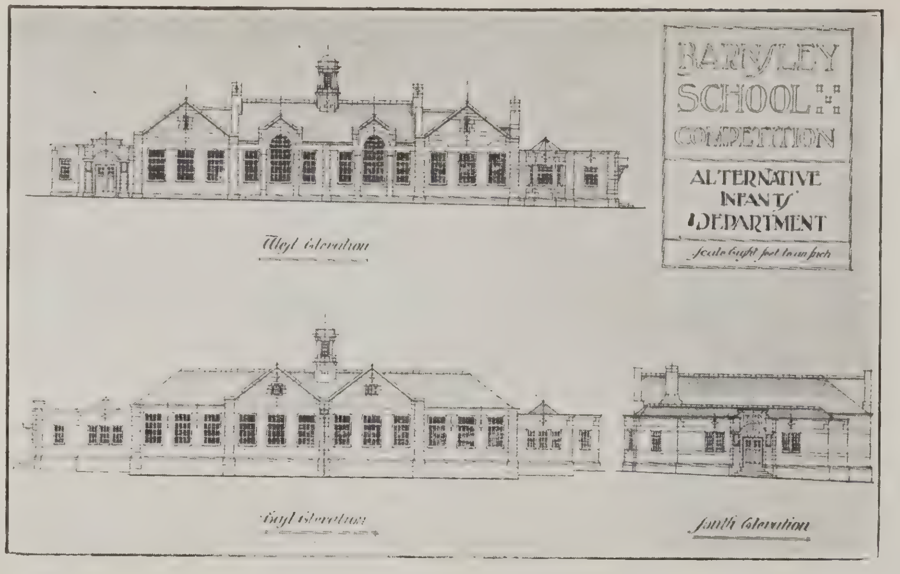
It was required that each department should be arranged with an assembly hall and five class-rooms, each class-room to be capable of accommodating 60 pupils, and four of the class-rooms in each department to be arranged in two pairs of two each, a folding partition of wood and glass separating the class-rooms forming a pair. The rooms were to be so disposed that the folding partition could at a later date, if necessary, be placed in another position, and a second partition added, so as to break up the pair of class-rooms into three rooms, each capable of accommodating 40 pupils.

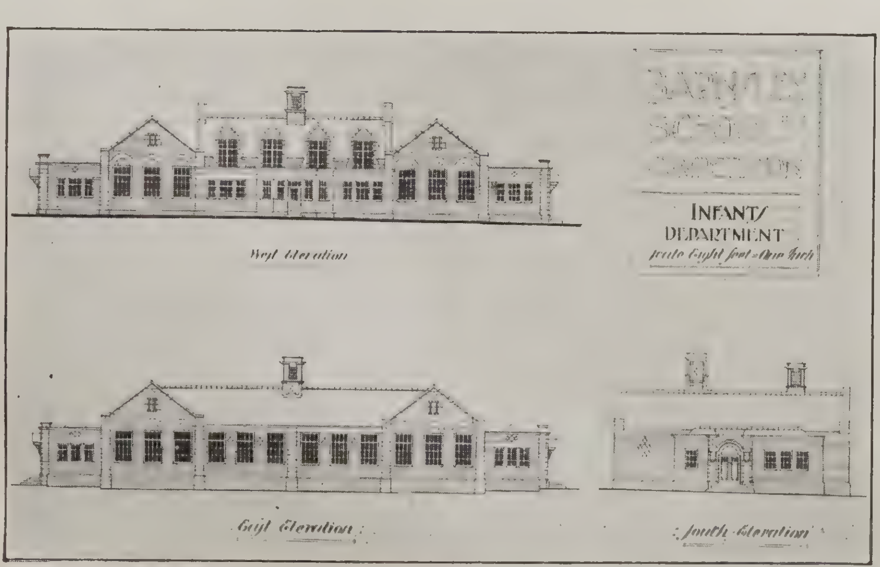


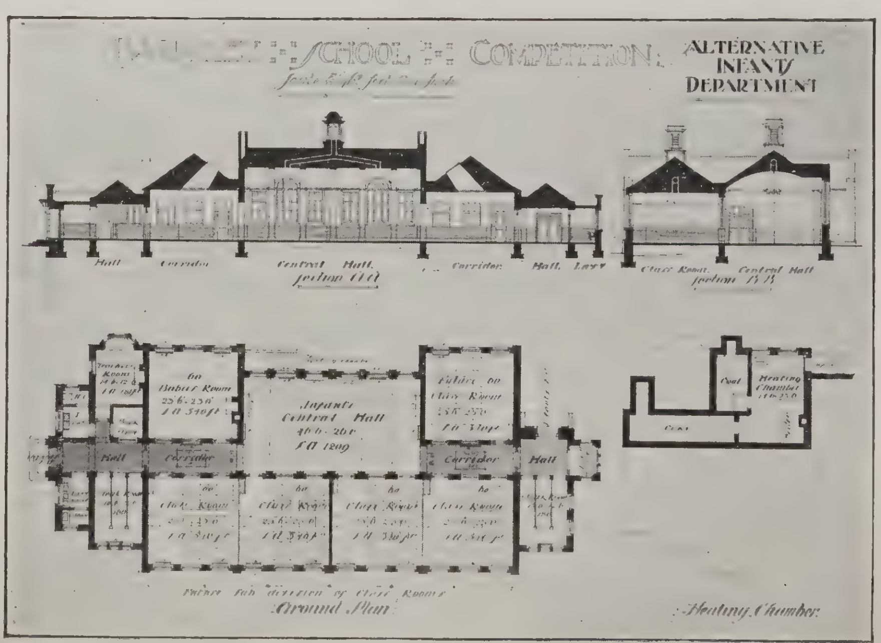
BARNSLEY'S NEW COUNCIL SCHOOL. FIRST PREMIATED DESIGN. E. W. DYSON, ARCHITECT.

In his report, the Assessor, Mr. Herbert T. Buckland, stated that in his selection he had been guided principally by two conditions which appeared to him to be of the first importance—namely (1) good disposition upon the site, and (2) side-lighted central hall. This design is characterised by satisfactory grouping of the class-rooms, and by the careful attention given to details.



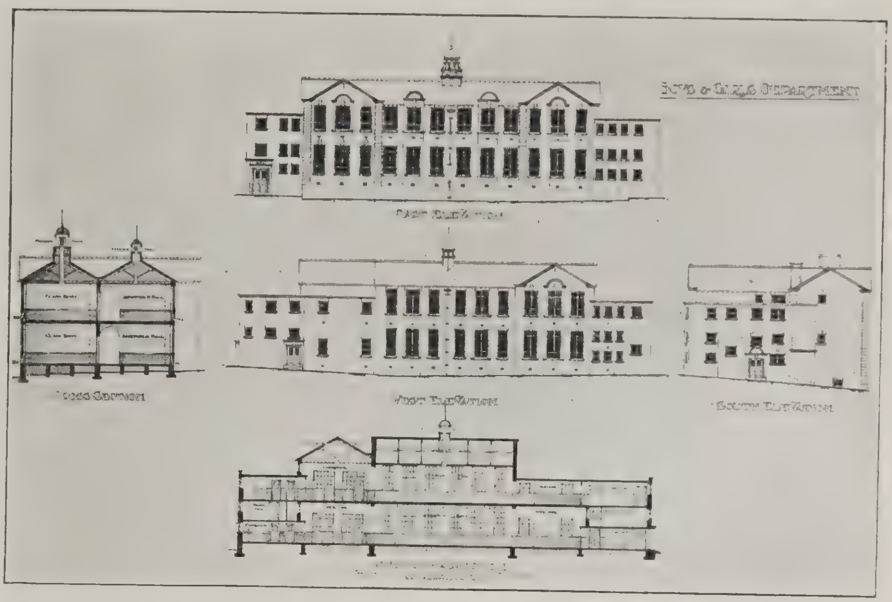

BARNSLEY SCHOOL COMPETITION
ALTERNATIVE INFANTS DEPARTMENT
Scale Eight feet to one Inch
West Elevation
East Elevation
South Elevation





BARNSLEY'S NEW COUNCIL SCHOOL. FIRST PREMIATED DESIGN. E. W. DYSON, ARCHITECT.

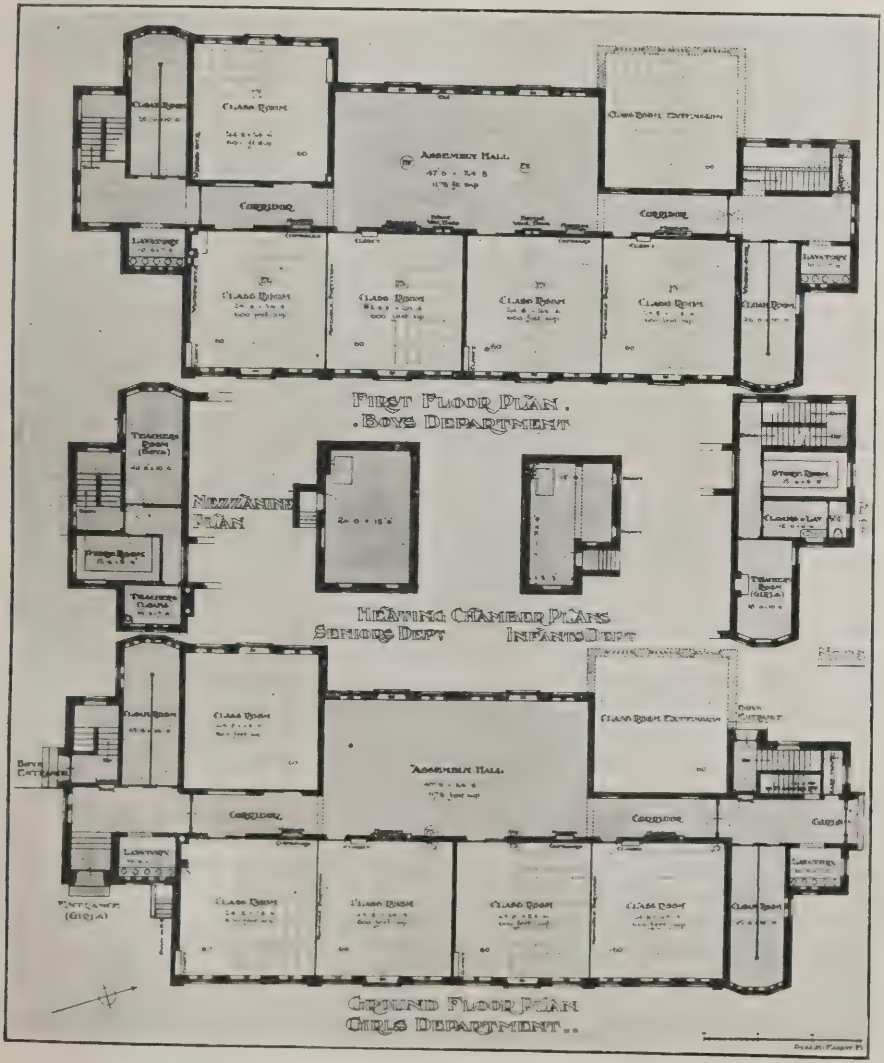
Sections are here shown of the boys' and girls' departments, and elevations and alternative elevations of the infants' department. The original scheme for this latter department shows the teachers' room and lavatories at one side of the main hall, with windows above. This gives better supervision, perhaps, than the alternative design, but prevents the entire side of the hall from getting direct light for a certain proportion of its height.



The additional accommodation required for each school was to include:—A teachers' room, not less than 150ft. in area, and placed so as to have full oversight of the respective playgrounds; a store-room; a heating chamber cellar in the basement, with ample storage room, and coal and coke chutes; lavatories and cloak-rooms, the former to be so arranged as to be accessible when the cloak-rooms are locked, the latter to be provided with separate openings for ingress and egress. In every room it was required that the main light should, as far as possible, be derived from the left-hand of the scholars, and in all classrooms in each of the departments an open fireplace was to be supplied. The offices were to be placed well away from the school buildings, separate w.c. accommodation being provided inside the buildings for female teachers. The respective playgrounds were to be laid with concrete or granolithic paving, and to have a playshed open on one side only. The school buildings were to be faced "with stone of approved quality," and the roof to be covered with green Westmorland slates. The utmost attention was to be devoted to the adequate ventilation of the various rooms.

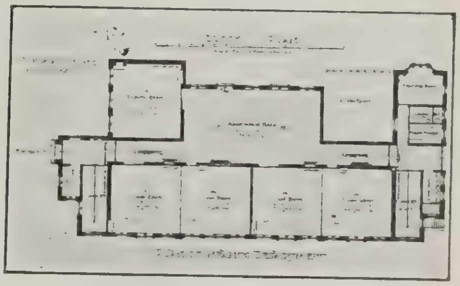
The selected design is the work of Mr. E. W. Dyson, 10, Regent Street, Barnsley; Messrs. Holtom and Fox, Corporation Street, Dewsbury; and Messrs. Clarke and Moscrop, Feethams, Darlington, being responsible for the schemes placed second and third respectively.

In his report, Mr. Buckland stated that in his selection he had been guided principally by "two conditions which appeared to him to be of the first importance:" (1) Good disposition upon the site, (2) side-lighted central hall. With regard to the first, as the site has a rapid decline of about 1 in 6, from west to east, its lower portion is best suited for the infants' school; as to the second, since the school must be in two blocks, side-lighted and well-ventilated halls are rendered possible, and no good reason can be advanced for surrounding them by class-rooms to the detriment of adequate lighting and ventilation. The next important point, in Mr. Buckland's opinion, was the consideration of the grouping of the departments. From motives of economy, it seems expedient to place the boys' and girls' departments one over the other, as each requires the same floor area. If, as in the case of some of the plans, the girls are placed over the infants, the rooms for the latter have to be made larger than is actually necessary in order to afford accommodation for the girls' area.



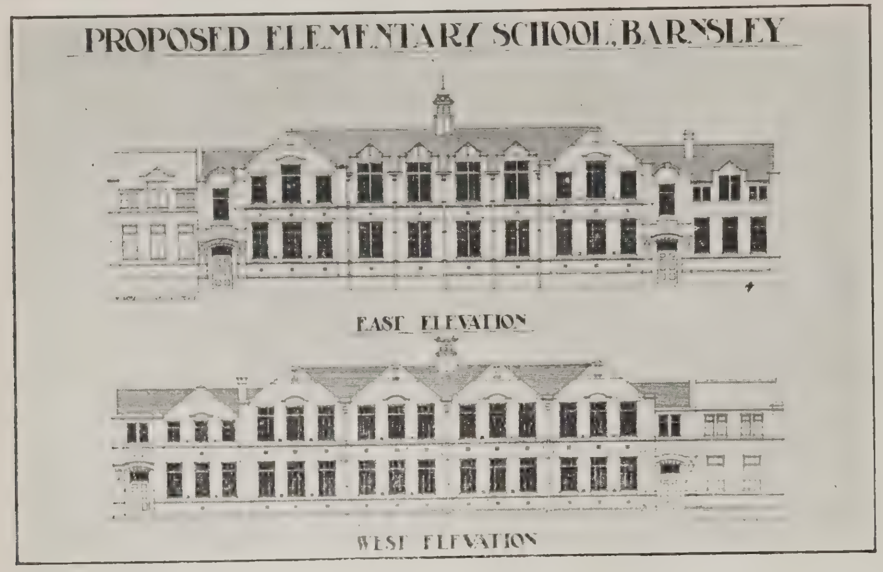
BARNSLEY'S NEW COUNCIL SCHOOL. SECOND PREMIATED DESIGN.
HOLTOM & FOX, ARCHITECTS.

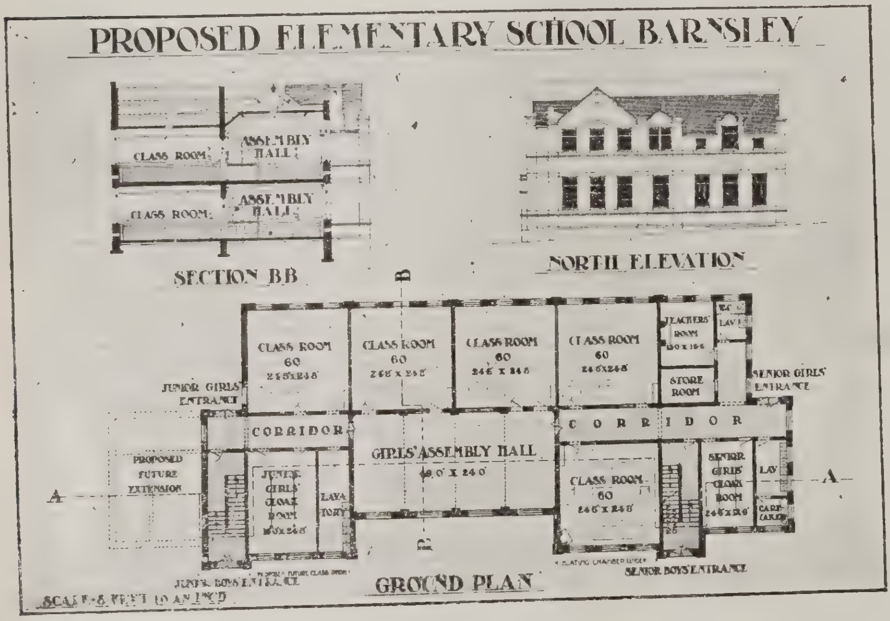
In this design the architects have evolved a commendably convenient grouping of class-rooms in relation to the central hall in the boys' and girls' block. It is perhaps to be regretted that more accurately balanced elevations were not obtained; but the general solution of the problem evinces real knowledge of the practical requirements of school planning.

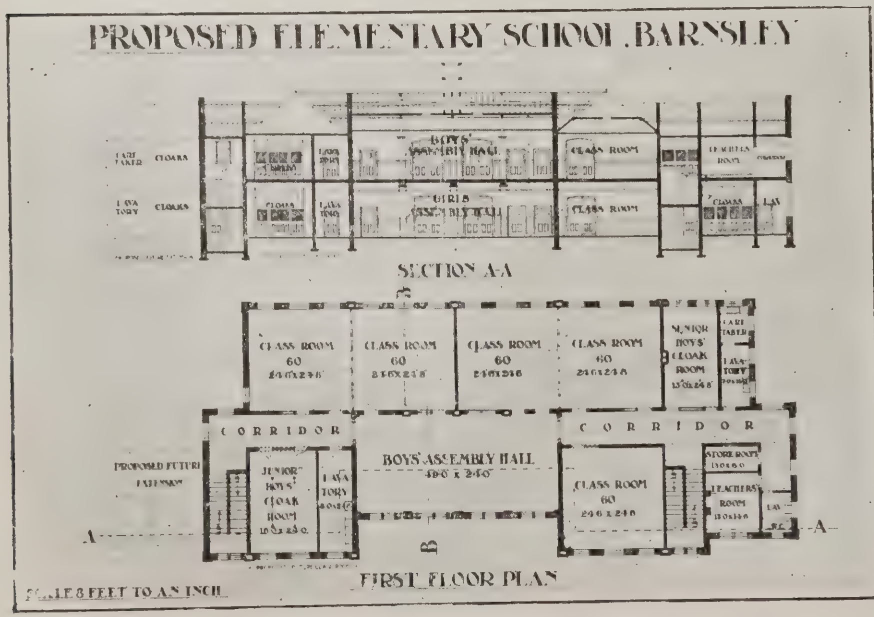


With regard to Mr. Dyson's arrangement, Mr. Buckland suggested that in order to guard against a through draught it might be advisable to alter the south entrance so as to face west, and that in the case of the playsheds for girls and infants, a sunny aspect would be preferable to their present northern one.

We entirely agree with Mr. Buckland in commending the thoroughly satisfactory grouping of the class-rooms and the careful consideration given to details in this design. It will be seen that the disposal of the blocks in each of the premiated schemes is practically identical—the parallel arrangement being obviously called for by the nature and shape of the site—and also that each of the successful competitors have so disposed their departments that the girls and boys are grouped together in one block of two storeys in which the girls have the ground floor and the boys the first floor, there being distinct entrances to each on opposite sides of the building. In the selected design the provision of lavatory accommodation and the placing of the cloak-room appears to us to have been admirably managed. The author has seen fit to submit an alternative infants' department. The original scheme shows the teachers' room and lavatories at one side of the main hall, with windows above. This gives good supervision—in fact, better than that obtained in the second arrangement—for the class-rooms (though perhaps not for the cloak-rooms), but prevents the entire side







BARNSLEY'S NEW COUNCIL SCHOOL. THIRD PREMIATED DESIGN. CLARKE & MOSCROP, ARCHITECTS.

The planning in this design contains many excellent features; but, on the whole, we should be inclined to endorse the judgment of the Assessor in placing it third.

of the hall from getting direct light for a certain proportion of its height. For the teachers themselves doubtless the alternative scheme is more satisfactory, but the arrangement results in a somewhat ill-balanced front. Still, in the elevation of the boys' and girls' block perfect symmetry has been obtained—an advantage over other designs which examination shows has not been gained at the expense of competent planning.

Messrs. Holtom and Fox, in the second premiated scheme, appear to us to have evoked a commendably convenient grouping of class-rooms in relation to the central hall in the boys' and girls' block. But the placing of the teachers' room on the mezzanine floor, although it might be very desirable for the teachers, is not quite all that could be desired from the point of view of organisation. It is to be regretted, we think, that more accurately balanced elevations could not be obtained, and their actual composition seems to us capable of improvement. The general solution of the problem, however, evinces a real knowledge of the practical requirements of school planning.

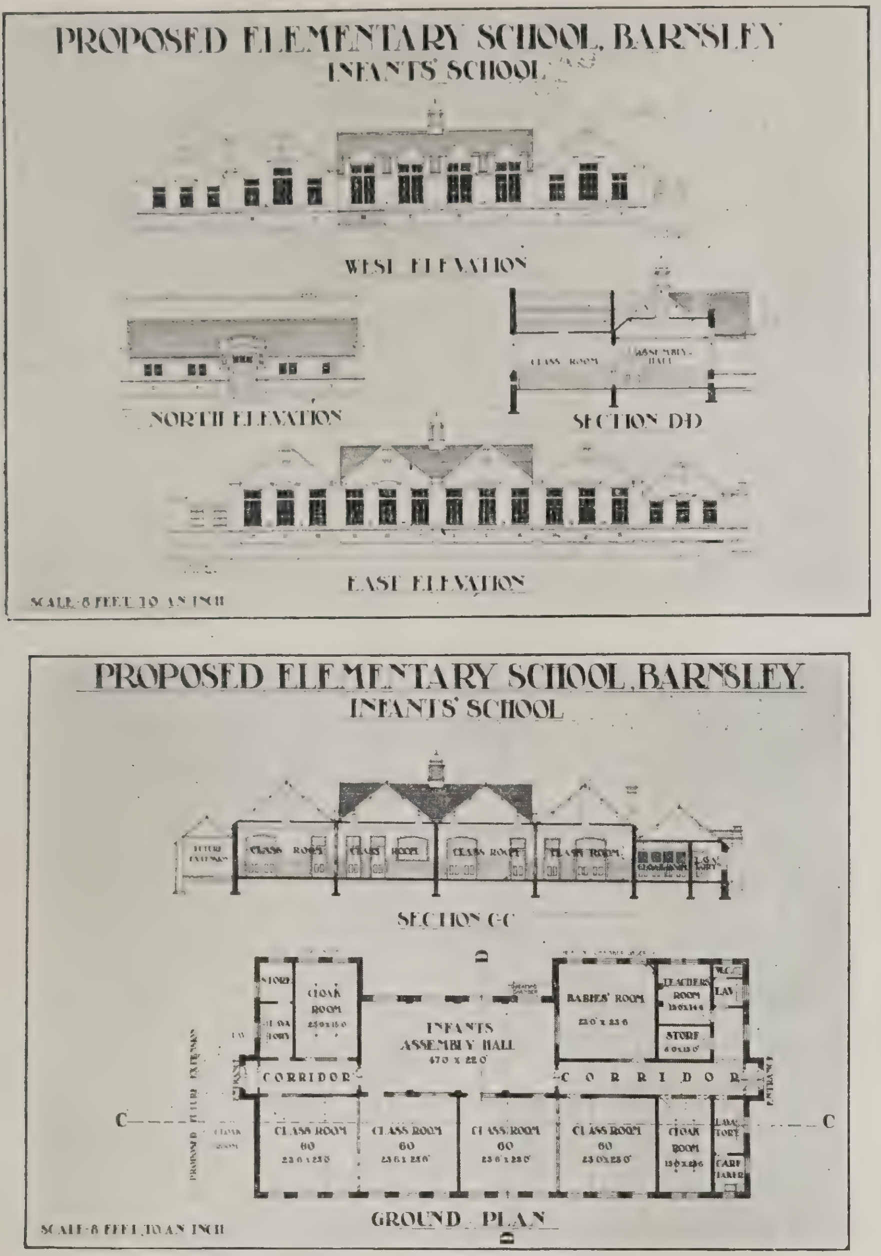
The third premiated design, that of Messrs. Clarke and Moscrop, departs from the general arrangement adopted in the first and second, in that the infants' block is placed away from the road, and all the departments—boys', girls', and infants'—have each separate playgrounds. In the other two schemes it will be seen that the girls and infants have to share a common playground. This latter arrangement does not appear to us to be so satisfactory. In the writer's opinion, the planning, though containing many excellent features, does not, on the whole, quite reach the level of the first and second designs.

Societies and Institutions.

University of Sheffield: Department of Architecture.

A prospectus issued by the University of Sheffield states that the Department of Architecture in that University was founded at the desire of the Sheffield Society of Architects and Surveyors, which society is associated with the Council and the Senate of the University in the management of the department. The Lecturer is Mr. W. S. Purchon, and Sir Aston Webb, C.B., R.A., chairman of the Board of Architectural Education, and Mr. Halsey Ricardo act as visitors.

The department provides (1) a systematic course of training for students wishing to become architects, to be taken by them before entering an architect's office, though not necessarily before they are articled; (2) an advanced and continuous course of study for students during their pupilage, and also when they become qualified assistants. Either course is open to those who are already in architects' offices, and students who are unable to take a complete course may, by arrangement, attend any part or parts of a course, subject to the approval of the Lecturer. The University will grant first-class and second-class certificates to students who complete their courses and pass the examinations at the end of the two years' day certificate course, and there is an advanced course for diploma. The courses are adapted to the requirements of the examinations of the Royal Institute of British Architects, and students obtaining first-class certificates countersigned by the visitors at the end of the two years' day certificate course will, subject to certain conditions, be exempted from the R.I.B.A. Intermediate exam. The Lecturer is assisted in the work and supervision of the advanced course by leading members of the architectural profession in the city, and by members of the staffs of various departments of the University. Messrs. C. F. Innocent, J. B. Mitchell-Withers, and J. R. Wigfull lecture on English Architecture, and Mr. E. M. Gibbs, F.R.I.B.A., has classes in Design.



BARNSLEY'S NEW COUNCIL SCHOOL. THIRD PREMIATED DESIGN. CLARKE AND MOSCROP, ARCHITECTS.

In the third premiated design, the infants' block is placed away from the road, and each of the departments has a separate playground.

CONTINENTAL STREET LIGHTING.

The Corporation of London recently appointed a deputation to visit several Continental cities for the purpose of inspecting the various systems adapted for the lighting of public thoroughfares; and the deputation has just reported the results of its investigations to the Court of Common Council.

The members state that in the main thoroughfares, squares, and market places of Brussels the illumination is by means of electric arc lamps with an ordinary incandescent gas-burner on each side. The arc lamps are turned off at midnight, after which time the lighting is supplied by gas. The side streets are lighted by incandescent gas. In Cologne the important streets of the city are lighted by centrally-hung electric arc and flame lamps with lowering gear; the open spaces by a combination of electricity and gas, and the minor streets mainly by incandescent gas lamps upon standards. In Dusseldorf a somewhat similar system is in vogue, while in Berlin the general arrangement for lighting is by means of electric arc lamps centrally hung and upon standards, electric glow lamps, and high pressure incandescent gas lamps with inverted mantles. In Dresden the electric arc lamps are of the open and flame type, a considerable number being suspended across the streets with side lowering gear. The side streets are lighted with low-pressure incandescent gas lamps, while the electric lamps are switched off at midnight, leaving incandescent gas lighting only. In Vienna the mode of street lighting is by means of arc lamps upon standards with incandescent gas lamps fixed on brackets below, together with low-pressure incandescent gas lamps fitted with upright and inverted mantles. Particulars are also supplied concerning the street lighting in Paris and Munich.

The members of the deputation state that, having very carefully considered the various systems, they are of opinion that the public lighting of the City of London can be materially improved, and recommend that wherever possible streets should be lighted by means of centrally-hung lamps with lowering gear, having in view the number of obstructions existing upon the footways in the shape of lamp-posts, bins, and letter-boxes. They propose further that the open spaces should be lighted by means of lamps upon standards fitted with lowering gear; also that high-pressure incandescent gas lamps with inverted burners should be adopted as the illuminant, but that where gas is impracticable electricity with open arc and flame arc lamps should be installed. It is proposed that before any drastic alterations in the general lighting of the City take place some further experimental lighting should be made.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
July 30	GRIMSBY TOWN HALL EXTENSION. Estimated cost £26,000. Conditions of competition sent to any applicant on receipt of a stamped addressed foolscap envelope. Full particulars, schedule of requirements, plans of existing buildings, etc., on receipt of deposit £2 (cheques to be made payable to Frank Stephenson, Borough Treasurer), which deposit will be returned to those who send in designs, or if the whole of the particulars are sent back within ten days from the date of their receipt by the applicant. Premiums of £250, £150 and £100. An Architect of eminence will advise in conjunction with the Borough Engineer. Applications to be made to the latter, H. G. Whyatt, Assoc.M.Inst.C.E., Town Hall, Grimsby.
July 31	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thorniiebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
Aug, 30	FOREST HALL, Elementary school for 250 scholars. County of Northumberland Education Committee invite designs from architects practising in the County and in the City and County of Newcastle-on-Tyne. Particulars, conditions and plan of site from C. Williams, Secretary to the Education Committee, The Moothall, Newcastle-on-Tyne.
Aug. 31	HUDDERSFIELD NEW CHURCH. Plans are invited for a church to seat 400, to cost about £2,000, not to exceed £2,500, with all fittings, furnishings, lighting and heating apparatus. Plans to be forwarded to the Rev. D. Macræ Tod, B.D., St. James' Manse, Huddersfield, by Aug. 31.
Sept. 1	BRANCH LIBRARY, NEW CROSS, for Deptford Borough Council. Limited to Architects practising in the City or the County of London. Assessor: J. S. Gibson, Vice Pres. R.I.B.A. Premiums, £52 10s., £26 5s., and £10 10s., for three selected designs, and will be awarded in accordance with the conditions contained in the instructions to competitors. Site plan and copy of instruction from Vivian Orchard, Town Hall, New Cross Road, S.E. Deposit £1 1s., refunded on receipt of *bona fide* design or if instructions are returned within 21 days.
Sept. 20	HULL TRAINING COLLEGE for teachers in Elementary Schools. The Education Committee invites Architects to submit designs. Premiums of £150, £100, and £50 to authors of the designs placed 1st, 2nd and 3rd respectively. Particulars and plan of site may be obtained of J. T. Riley, Secretary of Education, Albion St., Hull. Deposit, One Guinea, returnable on receipt of *bona fide* design, or the return of particulars within 14 days.

Mr. Jules Clement Chaplain, the French sculptor, who was a native of Mortague, Orne, has died in Paris. A pupil of Jouffroy, he won the Prix de Rome in 1863. He had real talent for plastic expression, and his technique was equal to his inspiration. Equally successful in imaginative work and portraiture, M. Chaplin produced noble pieces of statuary such as "L'Inspiration," a portrait of "Gambetta," and a charming group, "Mes Enfants." He was a member of the Institute of France, an Officer of the Legion of Honour.

Correspondence.

[*The Editor declines responsibility for the statements made by correspondents.*]

Middlesbrough Library Competition.

SIR,—We have now received the following reply to our letter of the 30th ult., from the Royal Institute of British Architects, in regard to the above competition:—

"9th July 1909.

"*Middlesbrough Library Competition.*

"DEAR SIRS,

"I am desired by the Council of the Royal Institute to inform you that your letter of the 30th June, addressed to the President of the Royal Institute, has been laid before them by the President, and as a result of their enquiry into the subject of your letter, I am to inform you that the decision of the Competitions Committee has the approval of the Council.

"Faithfully yours,

"(Signed) IAN MACALLISTER, Sec.

"MM. Hoskins and Brown, Kitching and Lee, and W. H. Bourne, Houndgate Chambers, Darlington."

We now propose taking counsel's opinion as to the position of the competitors in this competition.

Would those architects who signed the memorial, who have not yet forwarded the 5s. asked for, for preliminary expenses, kindly do so at once?

We should also be pleased to receive subscriptions from any other architects who sympathise with the object in view.

Any future action, after counsel's opinion is obtained, will be left to the subscribers.

Whatever counsel's opinion may be, architects will at least have the opportunity of knowing their legal position in future competitions.—Yours faithfully,

HOSKINS AND BROWN,
KITCHING AND LEE,
W. H. BOURNE, A.R.I.B.A.

Houndgate Chambers, Darlington.

Proposed New Works.

CAMBRIDGE.—A L.G. Board enquiry has been held into an application by the Town Council for consent to appropriate certain land belonging to the Council as sites for working-class houses.

GLASGOW.—The following linings have been granted:—John McNair, builder, 59, Bath Street, to erect tenements of dwelling-houses in Keppochhill Road, Alford Street, Gourlay Street, and Carlisle Street; Dick and Benzie, Forth Street, Pollokshields, to erect a villa in Eglinton Drive, Kelvinside; Rev. Wm. Booth, General of the Salvation Army, to erect halls on the north side of Flemington Street, Springburn; Wm. McMillan, builder, 73, Smith Street, Govanhill, to erect tenements of dwelling-houses in Garnet Street, Mount Florida; Richd. Henderson, architect, 80, Mount Annan Drive, to erect a villa in Kinmount Avenue, Highbury Park; J. and T. Parker, builders, 86, Bluevale Street, to erect buildings to be used as a post office sorting hall in Hillfoot Street, Dennistoun; George Outram and Co., Ltd., 65, Buchanan Street, to take down the existing buildings and erect new buildings at 7-9, Mitchell Lane.

GLENAFTON.—The Northern District Committee of the Ayrshire County Council have resolved to extend the accommodation of the Ayrshire Sanatorium by 20 beds at a cost of £4,609 14s. 2d.

GUILDFORD.—The Guardians are considering a scheme for the enlargement of the workhouse.

HAPTON (ACCRINGTON).—A great extension scheme is about to be carried out at Messrs. Riley and Sons' chemical works. The enlargement includes the erection of structures which will cover nearly four acres of ground.

HORNSEY.—The following plans have been approved by the Borough Council:—Plans for dwelling-house in Creighton Avenue, Muswell Hill, submitted by Mr. Charles Tucker; plans for motor shed at No. 37, Muswell Rise, Muswell Hill; plans for six dwelling-houses in Fortis Green Avenue, by Mr. George Henry Paine, Moorgate Street; and plans for five dwelling-houses and two maisonnettes in Priory Road, Hornsey, submitted by Mr. Charles William Boswell, The Parade, High Street.

HOUGHTON.—The Plans Committee recommended that the plan of a new temporary theatre be approved, so far as the Council could or legally may in the case of a temporary building, subject to an agreement being signed by the owners to remove the structure on six months' notice.

LONDON.—Mr. H. V. Lanchester, F.R.I.B.A., has prepared a report as to the suitability and adaptability of sites in the Borough of Marylebone, suitable for a new town hall. The two sites recommended by Mr. Lanchester are—one in Seymour Place, with an area of 27,150 sq. ft., which can be rented on an eighty years' lease for £750 per annum; and the other in Marylebone Road, with an area of 20,622 sq. ft., which can be purchased for £30,000.

LONDON.—The County Council have approved the erection of a garage on Wormwood Scrubbs, which is to house the French airship to be brought over for trial in August or September. Mr. H. O. Ellis is the architect.

ROSCOMMON.—The Town Commissioners having agreed to put the Housing of the Working Classes Act in force, it has been decided to apply for a loan of £7,000 for the erection of 25 cottages. Where possible, the houses will be built in terraces. They will be two storey, with terra cotta fronts, and each is expected to cost between £175 and £180, independent of the cost of site. Mr. Heavy, Four Roads, has been appointed to prepare plans and specifications.

ROTHWELL.—The vicar is appealing for a balance of £800 out of the £2,000 required to complete the restoration of the Parish Church.

SALTHOUSE.—The school buildings are to be enlarged in accordance with the requirements of the Board of Education.

SOUTHPORT.—Plans for a new music-hall have been submitted to the Corporation for aproval. The building, which it is proposed to erect in Lord Street, between Eastbank Street and Portland Street, is to have seating capacity of a little over 2,000 people. Mr. G. E. Tonge, of Southport, and Mr. Bertie Crewe, of London, are the joint architects.

SOUTHPORT.—The Southport Swimming Club has approved a scheme by Mr. T. Morris, architect, for the construction of two bathing pools, one for each sex, each 100ft. long by 40ft. wide in the North Marine Lake. The proposal is to be urged upon the municipal authorities.

WILLESDEN.—The Middlesex County Council and the Willesden District Council have decided to contribute £2,000 in connection with the enlargement of the Kilburn Training College.

Works in Progress and Completed.

BARGOED.—An English Wesleyan Chapel school is being erected here at a cost of £1,290. The school is part of a scheme which will include a chapel. Mr. William Harris, Bargoed, is the architect and Mr. John Brown, Bargoed, the contractor.

BELFAST.—The new church of St. Columbkille, Upper Newtownards Road, has been completed from the designs of Messrs. E. and J. Byrne.

BEVERLEY.—A new Baptist church is being erected here at a cost of £4,000.

BOWHILL.—The new public hall, erected by the Bowhill Public House Society, Ltd., has been opened. The hall is about 90ft. long and 50ft. wide. It will seat close upon a thousand people, and there are on each side of the main entrance door two "crush" halls. On either side, running the whole length of the public portion of the hall, is a corridor, 6ft. 6ins. wide, from which the large hall can be entered by a number of through swing doors. The stage is 42ft. long by 27ft. broad, and it is to be equipped to suit either variety or drama. Below the stage, off a spacious underground corridor, there are two large committee rooms. Messrs. Swanson and Syme, Kirkcaldy, were the architects, and the contractors were:—Mason, J. Summerville, Cowdenbeath; joiner, D. Arnott, Cardenden; iron and steel work, A. Brown and Co., Edinburgh; plumber, S. Binning, Cowdenbeath; slater, C. Stewart, Cardenden; plasterers, W. and J. Easton, Kirkcaldy; glaziers, A. Cunningham and Co., Edinburgh; heating, M'Kenzie and Moncur, Ltd., Edinburgh; and furnishings, Bennett Furnishing Company, Glasgow.

BRADFORD.—The new nurses' home at the Fever Hospital has been completed. Other alterations and additions to the hospital have brought the total cost up to £9,000.

CHESTERFIELD. — Messrs. Williams Deacon's new bank, at the corner of Stephenson Place, has been opened. The builders were Messrs. J. Collis and Sons, of Chesterfield. Mr. Thomas Taylor, of Eckington, was responsible for the joinery work, while the heating apparatus was installed by Mr. W. Haslam, of Harstoft, and electric lighting by Messrs. Alvey and Bower, of Chesterfield. Mr. F. Hill was entrusted with the plaster decoration, while Mr. R. Blake contracted for the painting. The architect was Mr. W. Cecil Jackson, M.S.A., of Chesterfield. The whole of the exterior of the building is faced with Stancliffe stone, the interior walls are lined with faience, the floors are of marble and oak blocks, and the whole of the internal fittings are of mahogany.

DOVERCOURT.—A new county high school is in course of erection on an elevated site near Blue House Farm, on the main Dovercourt to Colchester road. The building is to accommodate 136 scholars, and is to have facings of red brick, with dark red tile roof. The floors and staircases are to be of fireproof construction. All the classrooms have a south aspect, and the Assembly Hall, which is 24ft. 6ins. wide, and nearly 60ft. long, is designed to accommodate a possible extension of the school. In the west wing on the first floor, a commodious room, fitted for cookery instruction and scullery work, will be provided. Adjoining the cookery-room will be a dining-room for the use of children coming from a distance. The first floor of the east wing will consist of a chemical laboratory, with a chemical store and balance-room attached. There are also rooms for the headmaster and his assistants, and the boys are further provided with a workshop, detached from the main building. The architects are Messrs. Brown and Burgess, of Ipswich, and the contractors Messrs. Spencer, Santo, and Co., of Felixstowe.

LONDON (DALSTON, N.E.).—The Dalston Theatre is being altered and enlarged. Mr. George Billings, London Wall, E.C., is the architect, and Messrs. Stapleton and Sons, Stoke Newington, are the contractors.

MANCHESTER.—New offices for the Bowker Trustees are now being built in Strutt Street, Manchester, on the site of the "City News" old premises, from designs by, and under the supervision of, Mr. John Brooke, architect, Manchester. The whole of the constructional steelwork, fireproof floors, and granitic finishes are being carried out by Messrs. Homan and Rodgers, Manchester.

ONICH.—A new church, to seat 260, is being erected from the designs of Messrs. L. and J. Falconer, of Fort William. Messrs. E. and D. Stewart, Kinlocheil, are the contractors.

WIMBLEDON.—The new Pelham School, designed by Mr. H. P. Burke Downing, F.R.I.B.A., has been opened.

CONCRETE AND STEEL SECTION.

(MONTHLY.)

Short Formulæ. For the design of reinforced concrete many methods of calculation have been put forward. They, however, generally conform to one type, which is that favoured by the Joint Committee on Reinforced Concrete, by the French and German Governments, and by American by-laws. It would appear in these circumstances that the matter was definitely settled and placed beyond the caprice of designers, and that practical knowledge and deep study of the subject was of very little moment. In the design of reinforced concrete the principles upon which these calculations are to be based appear to be so well founded that it seems almost as though any student having the ability to understand these rules would be able to design structures in reinforced concrete perfectly satisfactorily. We find, however, that, as a matter of fact, there are very few engineers competent to design in reinforced concrete, and that these few are men of considerable practical experience, or who have at all events devoted much study to the subject. Mere rules do not to any great extent help the inexperienced designer. Even if he avoids serious errors he is apt to err on the side of excessive cost. That theory without practice is not all-sufficient for the reinforced concrete designer, is proved by the competition of engineers employed by firms engaged in the commercial exploitation of this method of construction. Engineers differ very considerably in their methods of preparing schemes, but as a general rule the successful and prominent engineers are those who do not employ the elaborate methods for calculation that have been put forward. No doubt these methods are logical, but as a rule there is insufficient time to employ them; and, furthermore, when they are employed, they result in the work being as a rule more expensive than that designed on the ordinary shorter formulæ. There are many advantages apparently, in the employment of an elaborate theory, especially in respect to the fact that by its use so many minor points are covered which in certain circumstances become important in their effect upon the resistance of the structure. If the short formulæ are used by inexperienced persons, grave errors may be made; but the long formulæ have great disadvantages which almost preclude their use in practical designing. In the first place they are very cumbersome to use, taking a great deal of time because they entail so many factors; and this loss of time implies a great deal of labour that is spent on the preparation of schemes only a small proportion of which mature. Secondly, their very elaboration leads to the possibilities of great mistakes. The use of shorter formulæ enables designs to be got out much sooner, but they are not so very accurate, after all; they, just as much as the elaborate formulæ, require to be used with intelligence. But an experienced designer knows their deficiencies, and seems easily able to see from inspection in certain circumstances that other factors have to be taken into consideration. In short, all formulæ need to be applied with common sense; and when we can obtain just about as satisfactory results in a shorter time by employing rough formulæ, the latter seems to be the better course. The more elaborate formulæ are perhaps indispensable for checking work that is in doubt. We may here remark that to some extent the disadvantages in the way of loss of time in the employment of elaborate theory can be off-set by the use of graphs or tables—preferably the former, because these graphs enable one to ascertain the mistakes much easier than from an inspection of a table. In fact, the curves on these graphs automatically check each other. Such diagrams can be comparatively easily compiled, and their use is extending. But even then it is more probable that greater advantage can be obtained from the judicious use of the shorter formulæ. These formulæ are shorter because they reduce or eliminate certain factors, and the ordinary elaborate formulæ can be reduced down to fairly convenient form.

Where Elaborate Formulæ Fail. We also take this attitude—that it is needless to employ an elaborate theory where variations in the materials and workmanship affect the result so greatly. It is no use calculating out to several places of decimals when the reinforcements can never be placed with great mathematical exactitude, and the materials vary so considerably, and their manufacture also varies within reasonable limits. Not only that, but these elaborate formulæ have been drawn up upon certain assumptions which are in accordance with the results of tests; indeed, we have found from the results of numerous tests that the theory, with modifications to suit, does not even then account for the ultimate resistance developed in many cases. We can easily understand results being less than as calculated, because of variation in the materials and places, but we cannot admit the theory to be correct when we find the results of tests exceed the strength that can be calculated by making the most generous assumptions. If then, the ordinary theory errs so considerably, why should we forbid the use of simple rules? The theorists are getting too much sway. Practice and common sense are very essential to the efficient designer, and it is for this reason that the design of reinforced concrete is in the hands of so few engineers. We rather doubt the efficacy of the proposals that the general practitioner—engineer and architect—should take up the design of reinforced concrete.

Unproved Assumptions. The subject is far more difficult than appears at first sight, and we see no advantage in wasting material and labour. There is nothing really to show that the designs prepared by specialist engineers are deficient in stability. The only mishaps that have occurred have been due to bad workmanship, the designs have practically never been shown at fault. It is therefore rather questionable whether it is advisable to limit reinforced concrete firms as to the theory which they should employ. There is no doubt about the rules drawn up by the R.I.B.A. Joint Committee on reinforced concrete erring on the safe side. That is all very well in its way, but it would be better if specialist firms were allowed to take advantage of their superior skill and knowledge. There is no "jerry-building" in reinforced concrete, and it seems, therefore, to us that it would be undesirable to increase the cost of building construction in this country by the imposition of rules that are based upon assumptions that have not been adequately proved as yet. Some firms possess the results of elaborate experiments, and point to a large amount of work that has been designed in accordance with the rules determined from consideration of these experiments. To show that these rules are sufficient in practice to secure an efficient and stable structure, and in the present state of our knowledge it would be better to rely on such empirical rules than upon official rules, our argument comes simply to this, that if the R.I.B.A. theoretical rules are to be admitted as safe, then we ought still more to admit those empirical rules which have every evidence of successful employment to support them.

Reinforced Concrete in the Colonies. Great interest seems to be displayed among Colonial architects and engineers on the subject of reinforced concrete, and also in the uses of ordinary plain concrete. It seems strange that architects and engineers in practice abroad, removed from centres of culture, and working often in small townships or situated in the midst of a native population, should apparently take more interest and be much keener on new subjects in connection with architecture and engineering than do a large number of practitioners in this country, but such seems to be the fact. Probably these men abroad feel much more the need of education, and the desirability of keeping in touch with the latest advances, than do architects and engineers in this country, who seem to think that any important new developments are sure to be forced on their notice. The man abroad, too, is more willing to experiment and investigate the merits of any new system. We find that the proportion of professional men abroad who closely study modern developments in construction is far greater than the proportion interesting themselves in such matters who are resident in this country. Perhaps it is because the profession in England is becoming rather stagnant. The country is overcrowded, and great works of construction are naturally fewer here than in the large undeveloped areas of a comparatively new country. We have built most of our large works, whereas these other countries are rapidly developing. As regards reinforced concrete, however, one of the reasons which has led to the considerable interest which is displayed among professional men resident abroad is that in these new countries there is not the same facility for obtaining the ordinary materials. Stone is there in plenty, perhaps, but there is a want of masons to work it. Bricks are perhaps to be obtained, but in small quantity and not in sufficient variety. Timber has its disadvantages, and cannot be used for permanent work. It is subject to the ravages of ants, and liable to decay by other means. Generally, too, all skilled labour is scarce, and the expense of the ordinary older methods is excessive. Concrete has the advantage of being easily manufactured by unskilled labour under a smaller amount of supervision from anyone skilled in the work. Plain concrete needs only manufactured material consisting of cement, and this can be easily manufactured in many places with a small plant; and though in others it is at present only obtainable by importation, it is thus to be obtained at a comparatively cheap price; and as it forms only a small bulk of the concrete this does not hamper its use. The same applies to reinforced concrete, though in many cases we find high prices are realised for steel, but the proportion necessary to meet requirements of structural members is so small that it likewise does not affect the matter materially. On the whole, reinforced concrete is comparatively very much more economical in the Colonies than it is in this country, though the prices of cement and steel are much larger than here. Compared with other materials, therefore, concrete, and reinforced concrete, are very cheap, and their efficiency very great. We find that they possess great advantages in many directions in this country, so in possessing still more advantages abroad it is no wonder that they are coming into extensive use. Therefore, we can begin to understand how it is that the Colonial architect and Colonial engineer take great interest in the subject. We have seen illustrations of a good deal of work that has been put up abroad successfully in concrete for which we should not have contemplated its employment. We may, for instance, refer to the large number of concrete houses that are being erected in New Zealand. The building trade in that country is extremely active, and the country has made great progress, and is settling down and requiring the erection of numerous domestic buildings. Large houses of elaborate architectural character, even artistic in appearance, are being erected by architects in concrete, while engineering structures of all kinds are carried out in reinforced concrete. The price of steel is very much higher in such countries. For instance, in New Zealand apparently it costs about £14 per ton for ordinary commercial sections. In that country there do not appear to be any prospects of local steel works being established, and steel is not obtainable from Australia. No doubt, a few years hence, steel of Australian manufacture will be obtainable, but it appears that by that time the competition that is experienced in this country between steelwork and reinforced concrete work will not be in evidence, because reinforced concrete will hold the field. The steel will be used in small sections, in which form it will be more readily obtainable than in joists or angles or T's, and of which stocks may be more readily kept, and so be more speedily obtainable. The future for concrete and reinforced concrete in the Colonies is bright, and its advance there has been made possible by the enterprise of local professional men in their study of the subject. Many of the Colonial architects and engineers are going into the subject sufficiently deeply to be able to design the work themselves, an attitude which is noted by its absence from among those at home, though perhaps the architects now being trained in our schools will be more cultivated in this respect. An example is set by our Colonial brethren which we should be glad to see followed by those in this country.

Strength of Columns. A point in the calculation of the resistance of reinforced concrete columns that requires careful consideration and investigation is eccentric loading. It is very difficult to determine what are the proper rules to find the eccentricity of any load upon a column. In steelwork we have been accustomed to take the load as coming half-way upon the bracket attached to the column; but with reinforced concrete, with the large brackets that are employed—chiefly because of the reverse bending moment at the supports—it has to be decided whether this is the correct procedure, because the eccentricity calculated in this way is so considerable. In fact, it would appear almost preferable to employ a smaller bracket, or no bracket at all if one could provide a sufficient moment of resistance over the support without its use. The problem becomes still more in doubt in connection with external columns round a building. Here beams rest upon the columns, generally upon brackets, but even then there appears to be no means of determining the value of the eccentric loading. Some rule is badly wanted in this respect, and the only suggestions in the matter that have been put forward up to the present are, that the size of the columns should be increased slightly, or else a richer concrete used. The former is done by limiting the stress upon concrete to, say, 400lb., instead of 500lb. per sq. in. This, however, is decidedly unsatisfactory, because in acting in this way we do not know that we are on the safe side. With a very wide-span girder it seems possible that we may get considerable eccentricity; and, again, if the column is extra long, this eccentricity becomes more serious.

Also, the fixing of the ends of the beams might be considered with advantage. Where external columns extend one above the other for several floors, for instance, and the beams come into the middle of these columns, the load on the column certainly fixes the end of the beam to a considerable extent. Indeed, it might be made to fix it completely, in which case the bending moment in the centre would be $\frac{W}{24}$. It ought to be possible to determine what is the real action in such cases. We think it is a point which might be closely considered by specialist engineers with a view to enlightening the profession upon the subject. The problem is not exactly a small one. It often arises, and it is really time we had some guidance in this direction apart from practice in the employment of a higher factor of safety, which seems at the present time to be the customary method of overcoming the difficulty.

RECONSTRUCTION IN FERRO-CONCRETE.

Reconstruction has recently taken place of the Tynemouth Palace, which is a massive building erected on the high ground of one of the most picturesque portions of the Northumberland coast. The building was originally erected, at a cost of about £120,000, as an aquarium and winter gardens. The premises and land cover an area of about three acres, and in the Palace itself the principal department was a large concert hall, with sitting accommodation for more than 2,000 persons and a promenade space for an additional 500. On the lower floor below the concert hall there is another large hall, equal in floor space to the concert hall, and 20ft. high, formerly used as an aquarium. This has now been transformed into a roller skating rink, and for this purpose the floor had to be specially prepared, and obstructing pillars removed. In order to effect these changes, the stage then existing at the north end of the hall had to be removed and a modern erection substituted, along with up-to-date flies and scene grill, as well as a handsome ornamental fibrous plaster proscenium. The whole of the concert hall ceiling has been treated in the same manner.

For the former quite level floor, a sound and fireproof of sloping floor has been substituted, affording from every seat a clear view of the stage. The front portion of the hall is used for stalls, and the rear for second stalls and pit, with standing room or promenade at the back of the hall. The old galleries which ran along each side of the hall have been superseded by a curved tier circle, and the side walls of the hall from the stage to the circle front have been panelled in fibrous plaster, giving the hall increased dignity and securing better acoustic results.

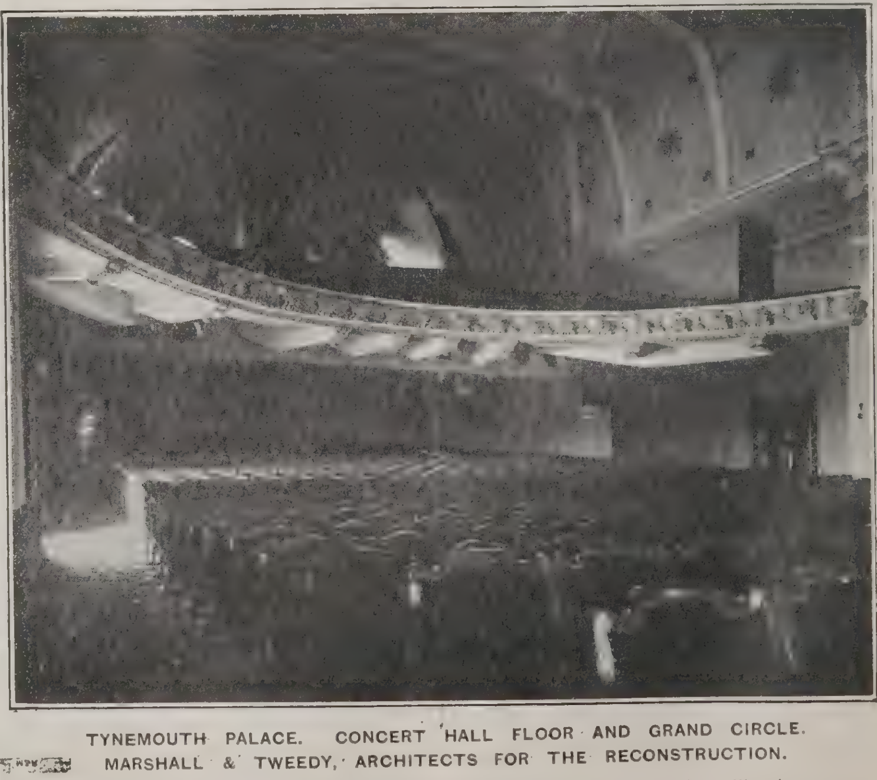
In the skating rink, which is about 210ft. long by 50ft. wide, the floor has been specially treated and laid with white maple. The old aquarium tanks on the west side have been done away with, and their roofs glazed in order that the rink shall be naturally lighted during the day-time. The tanks on the east side, after the old fronts were removed and the arches made good, have been converted into a spectators' gallery, 3ft. above the floor of the rink. The skate stores are placed at the south or main entrance end of the rink, and cloak room accommodation is provided on each side of these stores.

In the architectural treatment, a Georgian style has been carried out on broad lines.

The whole of the building construction, in ferro-concrete, was carried out by Mr. W. T. Weir, builder, of Howdon-on-Tyne. The details of the ferro-concrete work were designed on the Hennibique principle. The two rows of iron pillars on which the concert hall rested have been done away with, leaving a clear span of 50ft. in the skating rink. The cantilever principle, for which reinforced concrete affords excellent facilities, has been adopted for the gallery, pillars to support the tiers being thus dispensed with.

The official tests of the grand circle gallery and concert hall floor were conducted under the supervision of Mr. J. F. Smillie, Borough Engineer of Tynemouth. The instruments used for registering the deflections were sensitive to a deflection of 1-500th of an inch.

The gallery promenade has a span of 49ft. 9ins., and the total area of the floor put under test was 49ft. 9ins. by 23ft., or an area of 1,144 sq. ft. The normal superload for which the floor is calculated is 200lb. per square inch, making a total load of 102 tons on the beam tested. In order to ascertain the deflections on the beam tested, three



TYNEMOUTH PALACE. CONCERT HALL FLOOR AND GRAND CIRCLE.
MARSHALL & TWEEDY, ARCHITECTS FOR THE RECONSTRUCTION.

In the reconstructed concert hall a noteworthy feature is the treatment of the ceiling in ornamental fibrous plaster.

TYNEMOUTH PALACE. GENERAL VIEW OF SKATING RINK.
MARSHALL & TWEEDY, ARCHITECTS FOR THE RECONSTRUCTION.

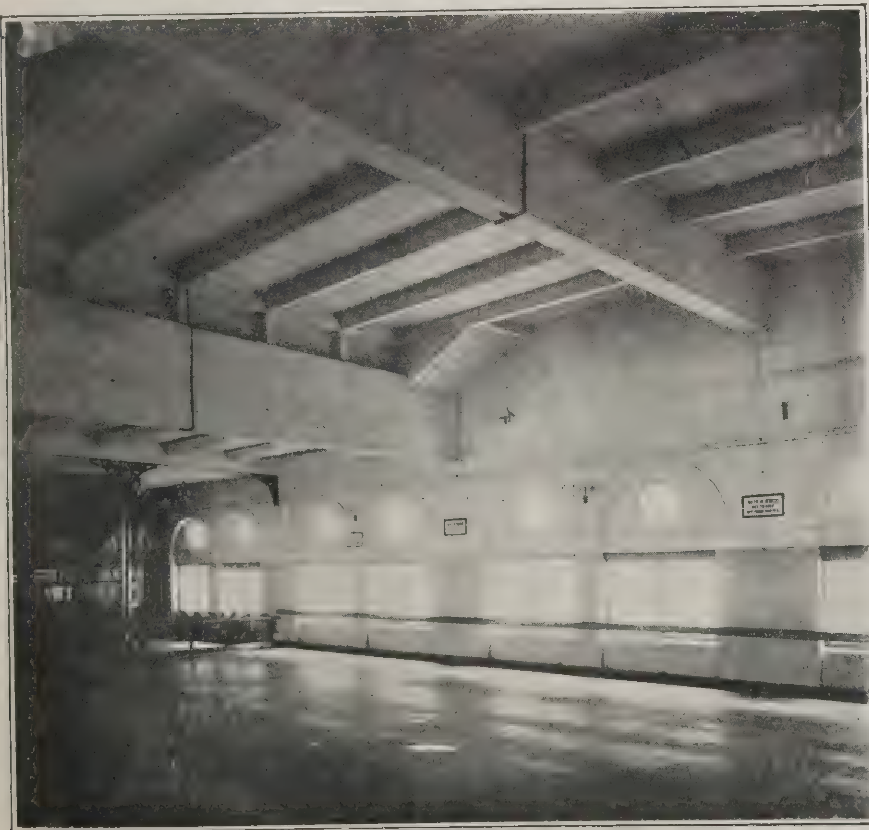
The building was originally erected at a cost of about £120,000, as an aquarium and winter garden. The large hall formerly used as an aquarium, has now been converted into a skating rink.

instruments were used. Under the full load the maximum deflection was 1-20th of an inch. In the gallery, which was tested on the same day, the span of the main beam is 49ft. 9ins., the total area tested being 49ft. 9ins. by 19ft., or an area of 945 sq. ft. The normal superload for which the gallery is calculated is, as before, 200lbs. per sq. ft., making a total load of 85 tons on the beam tested. For this test five instruments were used. On the main beam the readings of the deflectometers were as follows:—Deflector 1, within 1ft. from the support, nil. Deflector 2, at the middle of the beam, 3.5 m/m. Deflector 3, within 1ft. of the opposite support, nil. The deflection was therefor hardly 1-7th of an inch. As the deflection allowed by contract was 1-600th of the clear span of the beam, the test clearly demonstrated the strength of this construction, having regard to the fact that the gallery had only been completed 30 days before.

A further deflector was placed on the edge of the balcony, which registered 3.5 m/m, and a fifth placed midway between the main beam and the second beam at the back, which registered 1.3 m/m. With regard to the fourth deflectometer fixed on the edge of the balcony, it should be pointed out that, taking into account the deflection on the main beam on which the cantilever was fixed, there was no deflection of the cantilever registered. As a third test, the whole area of the cantilever portion was loaded with 200lb. per sq. ft., making a total test load of 59 tons, in order to ascertain whether the structure was well balanced. The readings of the deflectors 1 and 2 were 1.4 m/m and 1.5; of 3 and 4 1 and 1.4 m/m respectively; 5 and 6 4.1 and 8.5 m/m respectively. The deflection of the largest cantilever was therefore only 4.4 m/m, or about 1-6th of an inch. When the load was removed, the deflectors went back absolutely to zero.

The fourth test was that of the concert hall floor, which has main beams of 49ft. 9in. span. Each of these four beams was tested separately. The total area of the floor regarded as dependent on the first beam was 23ft. by 49ft. 9ins., or 1,144 sq. ft. The load taken was 200lbs. per sq. ft, making an actual load of 102 tons. Three deflectors were fixed, one being at the centre of the span, giving 4.1 m/m deflection; the other two being each placed 1ft. from the support, and giving 0.2 m/m deflection. The deflection of the beam was therefore 3.9 m/m, and consequently not 1-6th of an inch. In the case of the second, third, and fourth beams, the area of floor tested was 27ft. by 49ft. 9ins., or 1,343 sq. ft., in each case giving a total load of 120 tons on each beam. On the first beam the maximum deflection was 3.8 m/m, and the second 3.3 m/m, in both cases being under 1-6th of an inch. The whole of the deflections registered hardly reached 1-6th of the contract allowance, and the loads applied in the gallery equally 7½ cwt. per seat, each seat occupying the space of 2ft. 9ins. by 1ft. 8ins. The tests must therefore be taken as highly satisfactory.

In carrying out the reconstruction of this building, which involved the complete gutting of the whole structure, the architects (Messrs. Marshall and Tweedy, of Newcastle-on-Tyne and North Shields) made no attempt to cover up the constructional appearance of the work; and the facility with which this type of construction can be adapted to graceful and symmetrical arrangement is shown in the accompanying illustrations.



TYNEMOUTH PALACE. DETAILS OF GIRDER CONSTRUCTION FOR CONCERT HALL FLOOR.
MARSHALL & TWEEDY, ARCHITECTS FOR THE RECONSTRUCTION.

The concert hall floor has main beams of 45ft. 9in. span, constructed in ferro-concrete, and on this being tested, the deflections hardly reached one-sixth of the contract allowance.

Views and Reviews.

Applied Mechanics.*

This book is primarily intended as a text-book for engineering students. The author's idea is that the student finds much difficulty in seeing the applications of theory to practical problems, and to overcome this drawback he has developed each new principle by following the explanatory matters with a number of applications in practice. The problems in this book are thus rightly made to apply to practical engineering work in which not much new matter is included as regards the general principles of the subject, though the author has included a certain amount of new information. For instance, he treats the subject of couples by representing the couples by means of vectors. The chapters on the moment of inertia, centre of gravity, work and energy, friction and impact, it is claimed, are more completely dealt with in theory and application than they are in any other American text-book on the same subject. As these are matters upon which the engineer is frequently in need of information the work is of value to others than students. Professor Hancock has given numerous references throughout the work to original sources of information, and these will be valuable for any detailed study of the subject. Throughout the work free use is made of the calculus, by which principles are explained thoroughly, though shortly, because resort is not had to roundabout methods to demonstrate any subject by other means. The book is chiefly useful for students going through a college course, and it does not strike us quite so favourably as other books which contain fewer examples or problems and a greater amount of practical information, several excellent works on these lines being obtainable.

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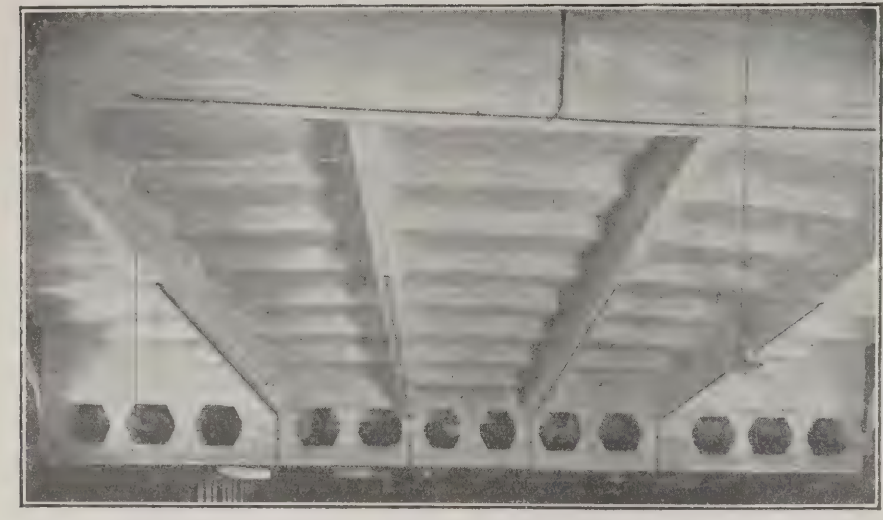
* "Applied Mechanics for Engineers." A Text Book for Engineering Students, by E. L. Hancock, Assistant Professor of Applied Mechanics, Purdue University. Published by McMillan and Co. Price 8s. 6d. net.



TYNEMOUTH PALACE. CONSTRUCTION UNDER THE GRAND CIRCLE.
MARSHALL & TWEEDY, ARCHITECTS FOR THE RECONSTRUCTION.

In carrying out the reconstruction, the architects made no attempt to cover up the constructional appearance of the work, which is therefore an object lesson in the facility with which this type of construction can be adapted to symmetrical and graceful arrangement.

Decimal Equivalents.*

No doubt, with our system of weights and measures, whatever advantages it may possess in certain directions, it does not provide so ready a means of performing calculations of addition and subtraction, and often operations of multiplication and division, as a decimal system. Many calculations can be more conveniently performed by converting our weights and measures into decimal equivalents. The metric system is a decimal system, but there is a large amount of opinion distinctly unfavourable to the metric system; still, objection is not so forcibly made to a decimal system in general. To those who have to make many calculations, this book of tables will be found of very great utility, because they have been compiled with the object of removing the only difficulty experienced with our system of weights and measures—namely, that of readily ascertaining the decimal equivalents of any given weight or measure. These tables are arranged so as to show, without any calculation, the equivalents for all the weights and measures in general commercial use in this country, and these are carried through to six places of decimals. It should be sufficient for the most careful work; indeed, for all ordinary purposes, two or three places suffice. For convenience in comparing our weights and measures with those of other countries, the tables of metric and other systems are included in the volume. Engineers will find this table-book of great value, because they often have to use the slide rule and other calculating machines, and such use is to a large extent hampered owing to the difficulty of working in decimals with our system of weights and measures. This book should enable these valuable aids to accuracy and speed in the work of calculation to be adopted more often in English work.

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* "The Instanter Decimal Tables of Weights, Measures, Monies, etc." Compiled by O. G. Winzar, F.S.M.C. London: Simpkin, Marshall, Hamilton, Kent and Co., Stationers' Hall Court, E.C. Price 1s. 6d. net.

Introductory Statics.*

Students of architecture and civil engineering have more use for statics than for kinematics, and they can, with advantage, take up the subject of statics in books devoted to that one branch of applied mechanics alone. This book is a useful introduction to the subject, for it gives considerable attention to the starting points of the science, and it makes as clear as possible the course of deduction therefrom. It points out the inherent mathematical limitations of pure statics, and shows how all its important problems are solved. It develops algebraic and graphic methods of solution, or, to use other terms, analytical and graphic statics, side by side, and finally presents a graduated series of problems showing how statics may be used in engineering practice. The book is fortunately small in size. The author prefers not to use the terms analytical statics and graphic statics, as he thinks they tend to obscure the unity of the science of statics, whereas they are only two alternative methods of procedure from identical premises. Problems are solved by the two methods in parallel, and in this way the results are checked by the two methods, and the solution of the problem is brought out in a much clearer light. The work is a valuable one as regards the first principles of the subject. Being specially designed for architectural and engineering students, it will especially appeal to our readers. The work is now in its second edition, which has been revised and enlarged.

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* "Statics by Algebraic and Graphic Methods," by Lewis Jerome Johnson, Professor of Civil Engineering in Harvard University. Second edition. London, Chapman and Hall, Ltd.; New York, John Wylie and Sons.

Chemistry and Physics of Building Materials.*

The student of architecture and building construction is, as a rule, not very scientific in his outlook and attainments. He does not follow very strictly the methods of science. By science we mean not exactly method—which is scientific, at least, in spirit—but the exact or experimental sciences. The building construction student is more practical or more empirical. Rule-of-thumb methods are to a great extent employed; much attention is paid to details of joints in carpentry, methods of laying stones, and so forth, but the general knowledge thus acquired and applied is the outcome more often of tradition than of theoretical deduction. The ordinary building construction student knows far too little about applied mechanics. He is not accustomed to determine the size of members by reference to the laws of stability. He makes few calculations for the strength of the various members by reference to the laws of stability, and our by-laws encourage no scientific study in this direction. Indeed, they are obviously intended for the man who knows nothing of mechanics and very little of mathematics. Knowledge with respect to material is still more hazy. Many civil engineers are just as much at sea. They may have read many books on applied mechanics, but they seldom take the trouble to experiment with the materials and realise exactly what they are. We believe that, in the architecture of the future, scientific training will be appreciated far more than the ability to make pretty drawings. The book under notice represents the first attempt that has been made to give an adequate introduction to the sciences of chemistry, physics, and geology in connection with materials used in building construction. It will be found of as much use to engineers as to architects. In such an introduction as this the author must have found great difficulty in compressing a great mass of information which he would wish to embody. We would gladly have seen each branch of the subject dealt with in greater detail, and perhaps the most formidable criticism we could advance is that the book gives either too little or too much. For a mere introduction to the subject it supplies rather too much detail, for a thorough treatise not enough. Nevertheless, the author produces a great amount of valuable information. The book begins with some general chapters on elementary science. The author says in his preface that his chief object in these chapters is to enable anyone having no knowledge of science whatever to appreciate something of the principles which underlie the subject. As this is all he has set himself to do, we rather grudge the 104 pages—about one-third of the entire volume—which he has devoted to this introduction to elementary science. It would surely have been preferable to cut down this matter to much smaller limits and to devote more space to the subject of building materials. In Part 2 of the work, which deals with these materials, he treats of stones, clays, and cementing materials, metals, timber, and paints. Without criticising the work in detail, we may say that it is not only very free from error, but is well written. It is, in fact, an excellent textbook, in spite of its faulty proportions, which are not confined to the introductory chapters, but are also observable in other parts of the work. For instance, we find over thirty pages devoted to paints, whereas only nine are given to Portland cement. A specialist on any of the various matters contained in the book would probably feel inclined to complain of inadequacy; but it must not be forgotten that the book is not addressed to specialists, and that the author was bound to compress his matter within rather strict limits. As it is, the book is undoubtedly of great value. It is the kind of work for which a distinct need exists. There is room for much scientific work in the demonstration of the scientific principles of many branches of the subject of building construction and structural engineering.

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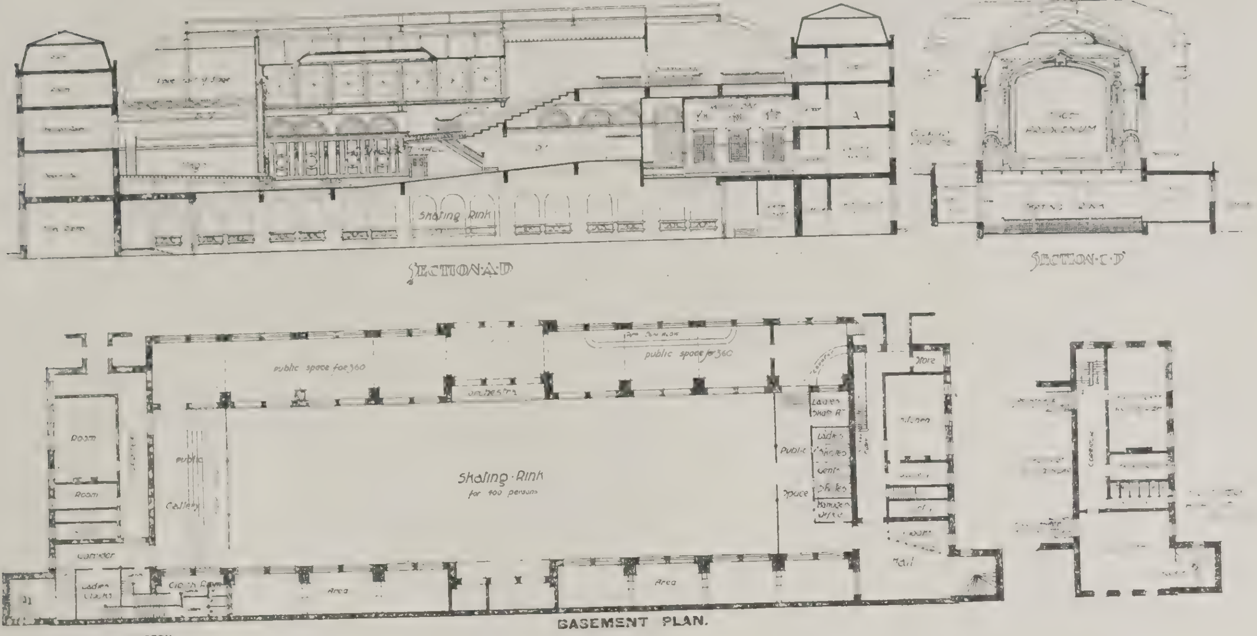
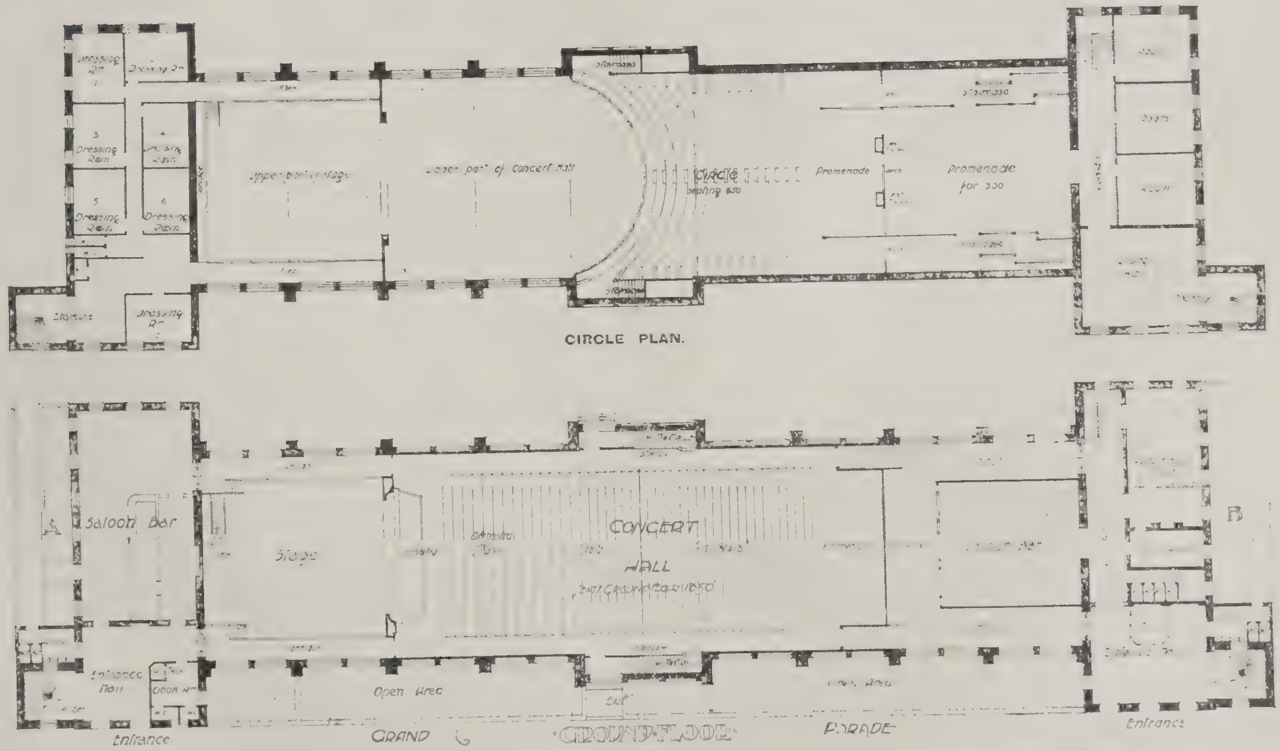
* "Introduction for the Chemistry and Physics of Building Materials," by Alan E. Munby, A.R.I.B.A., F.C.S. London, Archibald Constable and Co., 10, Orange Street, Leicester Square, W.C. Price 6s. net.

The current issue (for July) of "The Architectural Review" has for frontispiece the reproduction of a fine drawing of a portion of the ornate elevation of the library of St. Mark's, Venice. In that extremely useful and no less interesting feature of the "Review" "The Practical Exemplar of Architecture," are included an elevation and measured drawings of details of Wren's fine old doorway at No. 5, King's Bench Walk, Temple, as measured and drawn by Ernst V. West; almshouses, Audley End, measured and drawn by H. A. McQueen; interior views of All Saints', Walsoken, Norfolk, with measured drawings by E. H. Bullock, of the fine rood screen; and a view and measured drawings, again by Ernst V. West, of a gate and piers of the close at Salisbury. Other illustrations show Evelyn's plan for the rebuilding of London after the Great Fire; drawings by Edwin F. Reynolds in illustration of his continued article on "Imperial Mosques of Constantinople"; a view of Professor Beresford Pite's front to Martin's Bank in the Euston Road; an exterior view, an interior, and plans of "Redcourt," Whitfield, Derbyshire (Paul Ogden, architect); views and plans of the Victoria and Albert Museum (Sir Aston Webb, R.A., architect); an exterior and an interior view of the Hammersmith Public Baths (J. Ernest Franck, architect).

FIRST FLOOR AND BASEMENT PLANS, TYNEMOUTH PALACE.



MARSHALL & TWEEDY,
Architects,
Newcastle-upon-Tyne and North Shields.



MARSHALL & TWEEDY,
Architects,
Newcastle-upon-Tyne and North Shields.

TYNEMOUTH PALACE PLANS. MARSHALL AND TWEEDY, ARCHITECTS FOR THE RECONSTRUCTION.

The premises and land of Tynemouth Palace, which is a massive building erected on the high ground of one of the most picturesque portions of the Northumberland coast cover an area of about three acres. In the building as it originally stood (it was intended for an aquarium and winter gardens), the principal department was a large concert hall, with sitting accommodation for more than 2,000 persons, with gallery accommodation for an additional 500. The two rows of iron pillars on which the concert-hall rested have been removed, leaving a clear span of 50ft. in the skating rink. In the gallery also, by the adoption of the cantilever principle, for which reinforced concrete construction affords excellent facilities, pillars to support the tiers have been dispensed with.

SOME COMMON COMPLAINTS OF CEMENT USERS.

The chemical and physical tests of cement are somewhat beyond the scope of the average consumer, who generally depends upon practical results, preferring to watch the action of cement in work rather than to rely upon what results may be shown by laboratory records. This "practical" testing, however, is far more likely to give erratic results as to the qualities of cements, and with far more serious consequences, than any recognised theoretical tests, for there are innumerable ways in which a cement of perfectly satisfactory quality may, by faulty manipulation, be made to appear otherwise; and, again, there are many aggregates which destroy the otherwise sound qualities of really faultless cements.

The practical test is often "the parting of the ways" between manufacturer and consumer. As well as being extremely unscientific, this test is fair to neither one nor the other, and in the event of unsatisfactory concrete work resulting, two diametrically opposed courses are adopted by the cement maker and the purchaser, the one contending that he is only responsible for the quality of his cement, and the other that he is not responsible for any faulty work carried out with the cement he purchases.

The position that thus arises can generally be settled to the satisfaction of both parties by the exercise of a little intelligent interest and labour in investigation, and far more often can the causes of faulty work or the failure of a cement in a practical test be truly ascribed to faulty use rather than to inferior cement. The manufacturer often safeguards his position by having samples of the alleged faulty cement tested to the recognised standard of quality or specification, and there he considers his responsibility ends. This attitude may perhaps be admitted to be just, but the cement maker, in addition, should exercise his skill in further explaining to the consumer in what points "practical" test may have been fallible, if only in vindication of the status of his manufacture.

For instance, the cement maker will find it to his advantage to assist his customers down to the smallest detail of the work, so far as he is able. They will appreciate his efforts, and will prefer to purchase from him on account of the additional services he renders to them.

This may appear at first sight to be a weak argument, the customer being given information for which no consideration is received in return. In practice, however, such assistance to customers brings good financial returns, because the maker is able to exercise a certain amount of control over the way in which his product is used, and to maintain the reputation of his cement at a higher level than would otherwise be the case.

In most complaints of faulty cement nowadays there is perhaps more truth in the assertion that "poor workmen always blame their tools" than in the quality of the "tools" brought into account. Many complaints compare only with the case of the cook who excuses heavy cakes by blaming the flour.

Portland cement, however superior its quality, can never give satisfactory results unless properly dealt with, and, being the perfectly scientific product that it is, the number of ready methods by which the best quality of cements can be easily made to give unsatisfactory results is legion.

Primarily there is the difficulty of obtaining efficient supervision in concrete constructional work; for little interest is shown by workmen in so dreary an occupation as filling concrete into wood troughs, and, moreover, ordinary labourers have, as a rule, preconceived notions on the subject which are with difficulty got rid of.

As to cement, after the endless stream of information, investigation, and discussion upon Portland cement—its manufacture, testing, and uses—the ignorance of workmen is deplorable—not, of course, those in charge of concrete works, but the workmen under supervision, whose every movement must be closely watched. So long as cement is thus used or misused, so long will there be defects in concrete construction to be investigated.

It is not sufficient, therefore, for the cement maker to produce first-class cement unless he exercises some care that it is supplied only to people who will use it properly, and not bring discredit on the maker by ignorance or carelessness.

In describing, then, more fully, some unjustifiable conditions in regard to the use of cement, a few instructions are here submitted as to the way cements should be employed to give the best results.

It is remarkable what a consensus of opinion prevails among cement consumers as to the cause of *any* fault in concrete constructional work. It is *always* the cement!

Complaints are either justified or they are not, and in the latter case the species of unjustifiable complaints can be classified under certain definite headings, such as from the result of (a) prejudice, bias, or sentiment; (b) experience, or ignorance; (c) malice or motive; and (d) chronic dissatisfaction, which seems to depend upon some physical state—say, torpid liver, or some such "common complaint."

With the present-day scientific manufacture of Portland cement, few complaints as to quality are really justifiable. It is, indeed, certain that if any Portland cement passes the British Standard specification tests, no amount of complaining or investigation could show that such a cement would be the cause of any unsatisfactory work when properly incorporated in concrete. The bulk of complaints, therefore, it will often be found, come under one or other of the above headings.

As to the first cause of complaint or dissatisfaction, all intelligent persons have a found of distinct likes and dislikes in colour, form, proportion, quality, etc. In the same way, many cement users have distinct preferences for particular brands of cement, and if they cannot obtain their favourite brands, then the substitute is not to their satisfaction, and the seller of the substitute is likely to hear of it.

As to the second species, if the cement is good, what matters it to them if the cement is mixed with any sort of material, provided it is obtainable at a sufficiently low price? Certainly there is a specification for aggregates, but it often happens that very little attention is paid to it. The result is that occasionally some apparently unaccountable failure occurs, which is always—and seldom with justice—attributed to the cement. Most of such failures can be proved to be due to lack of knowledge on the part of the workman and to unsuitability of the aggregate. Chalk, coal, and lump lime have been found in samples of concrete which have either actually failed or have been so unsuitable that a complaint has been the result. No just-minded consumer could expect concrete in which chalk was the aggregate to be mechanically strong; yet users of such an aggregate do not hesitate to condemn the cement.

As to complaints that arise from mere malice or motive, perhaps the less said the better, but since it is a fact that complaints are often known to arise under these conditions, they must of necessity be mentioned in this article. Under this heading might be included the case of the complainant who tries to obtain extended credit or evade the payment of his account by calling into question the quality of the product long after it has been used.

Where a complaint is the result of torpid liver, the party who gives way to such physical attacks is an odd but nevertheless strenuous grumbler, and is to be dealt with firmly but kindly.

It must therefore be conceded that in numerous ways cement work may prove unsatisfactory from causes which are altogether beyond prevention by the manufacturer, and have no relation whatever to the quality of the cement. Probably the most common cause of trouble is the failure to recognise the fact that the setting of Portland cement is a chemical process which may easily be retarded or destroyed by unfavourable conditions or interference. Care, experience, and supervision are always necessary in the use of cement, and it is poor consolation for loss of time and money to throw the blame for faulty work on the manufacturer. He now works on much more scientific lines than formerly, and can generally make out a strong case for the defence where necessary. The ways in which cement work may be spoilt by the user are too numerous to enumerate fully, but the following illustrate some ways in which this very undesirable position may be attained:—

(a) The use of too much or too little water during mixing, or water carelessly applied, or water containing earthy matter, clay, or loam.

(b) The use of an insufficiently graded aggregate, and one containing only very coarse material, or one with too much sand or loam.

(c) By not thoroughly incorporating the aggregate with the cement; by allowing the concrete to stand until the setting action has commenced, and then regauging before use. By rendering cement work on dry foundations and without thoroughly saturating the surface with water.

(d) By using a dirty aggregate.

The cement user needs to know, first of all, what he really wants in a cement—that is, what properties are of special value in his work. With this knowledge will come a better realisation of the necessity not only for uniform methods, but what is more to the point—uniform tests. When he realises that because one brand does not harden quite so rapidly as another it is not necessarily inferior for the average piece of work; and that the cement which fails to gain 12 or 15 per cent. over 900lb. from seven to twenty-eight days is not likely to suffer by comparison with average cements in any other way; that when properly made and seasoned these cements are equally good for most ordinary work (although one or other may be superior for some special work); when these facts are generally understood and appreciated, there will be no reason for a manufacturer to modify his test methods so as to make a given showing—to obtain predetermined results—and uniform tests will be advanced a long way, and the manufacturer will be the first to hail such a condition of things with satisfaction.

Now this position necessitates an extremely careful study in the testing and uses of cements when the same are employed in concrete work, both in the mixing with water and more especially with the choosing and mixing of aggregates and the handling of the concrete.

At the new Military Families' Hospital, Shorncliffe, which was opened recently by H.R.H. Princess Christian, for H.M. War Department, Messrs. J. F. Phillips and Son, heating engineers, of 21, Old Queen Street, Westminster, and Brighton and Liverpool, carried out the heating apparatus and domestic water supplies.

* * *

The decay of the stonework at Westminster Abbey proceeds with alarming rapidity. Dr. John Owens states that "repairs executed only twenty or twenty-five years ago are decaying more or less; that work executed only fourteen years ago is in a bad state; and that that done in 1701 shows signs of being reduced to a friable mass to a considerable depth below the surface." Mr. Edward Hull recommends, in substitution for the fine granular or oolitic limestone of the Jurassic formation that has been used, the building stone of the New Red Sandstone formation, to be found in Stafford, Salop, and Cheshire.

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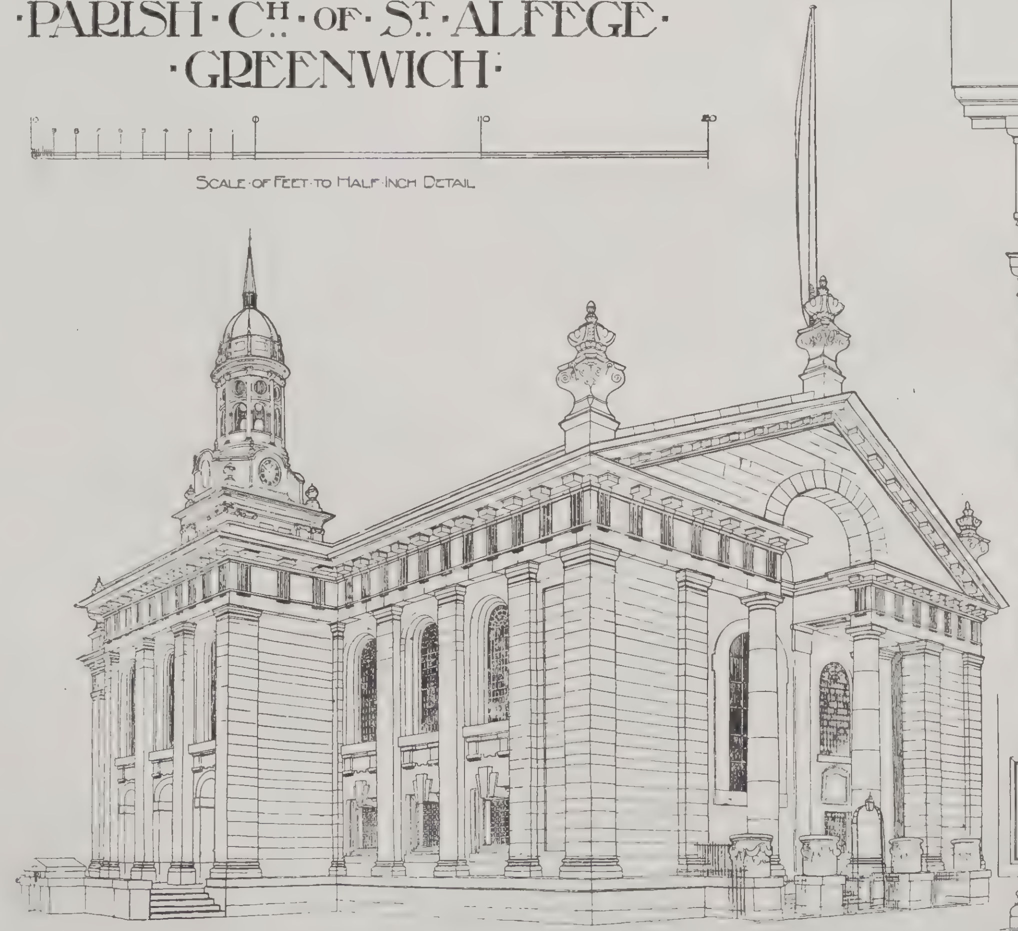

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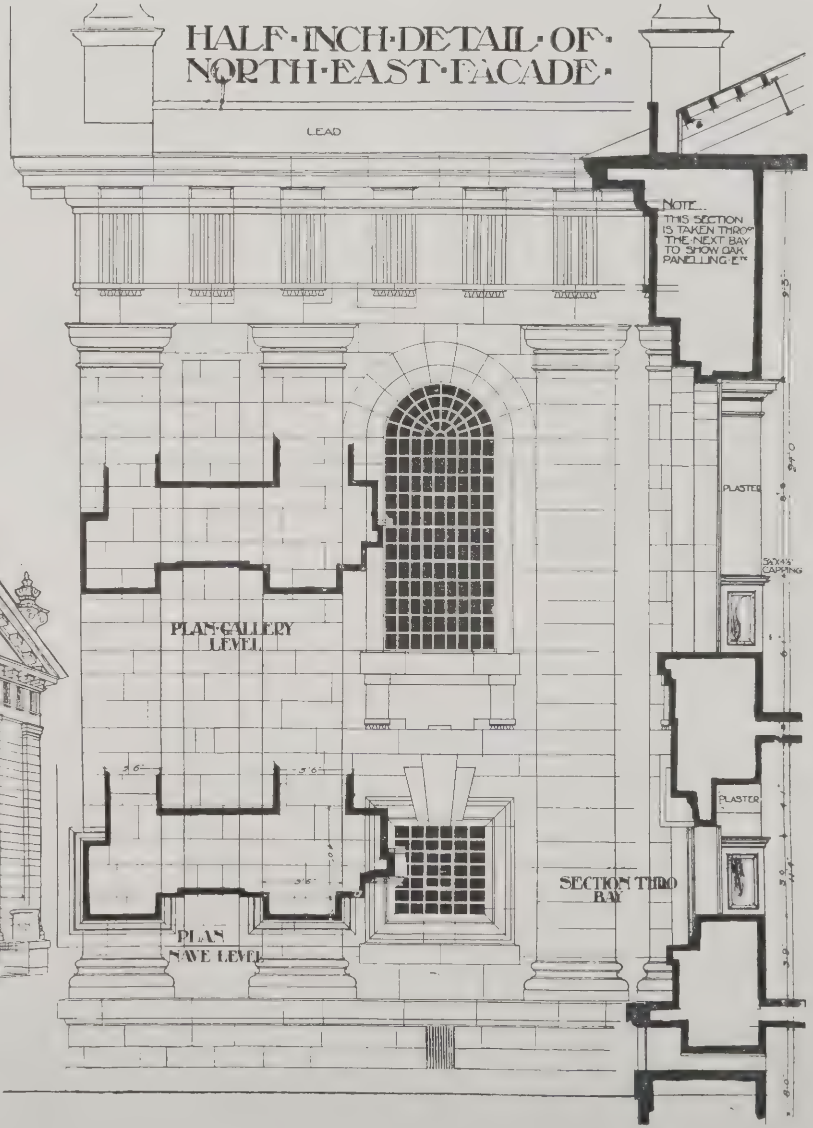
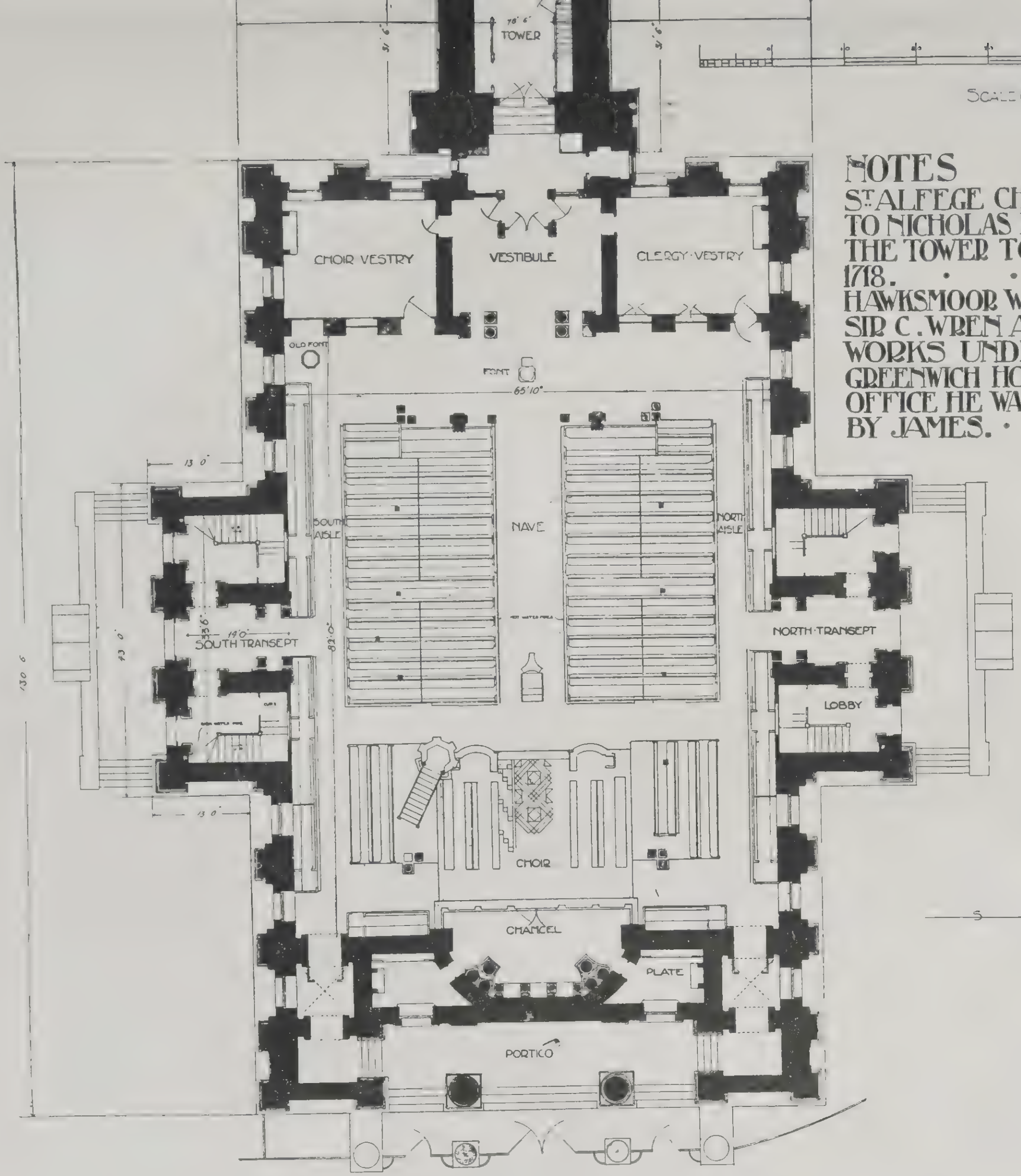


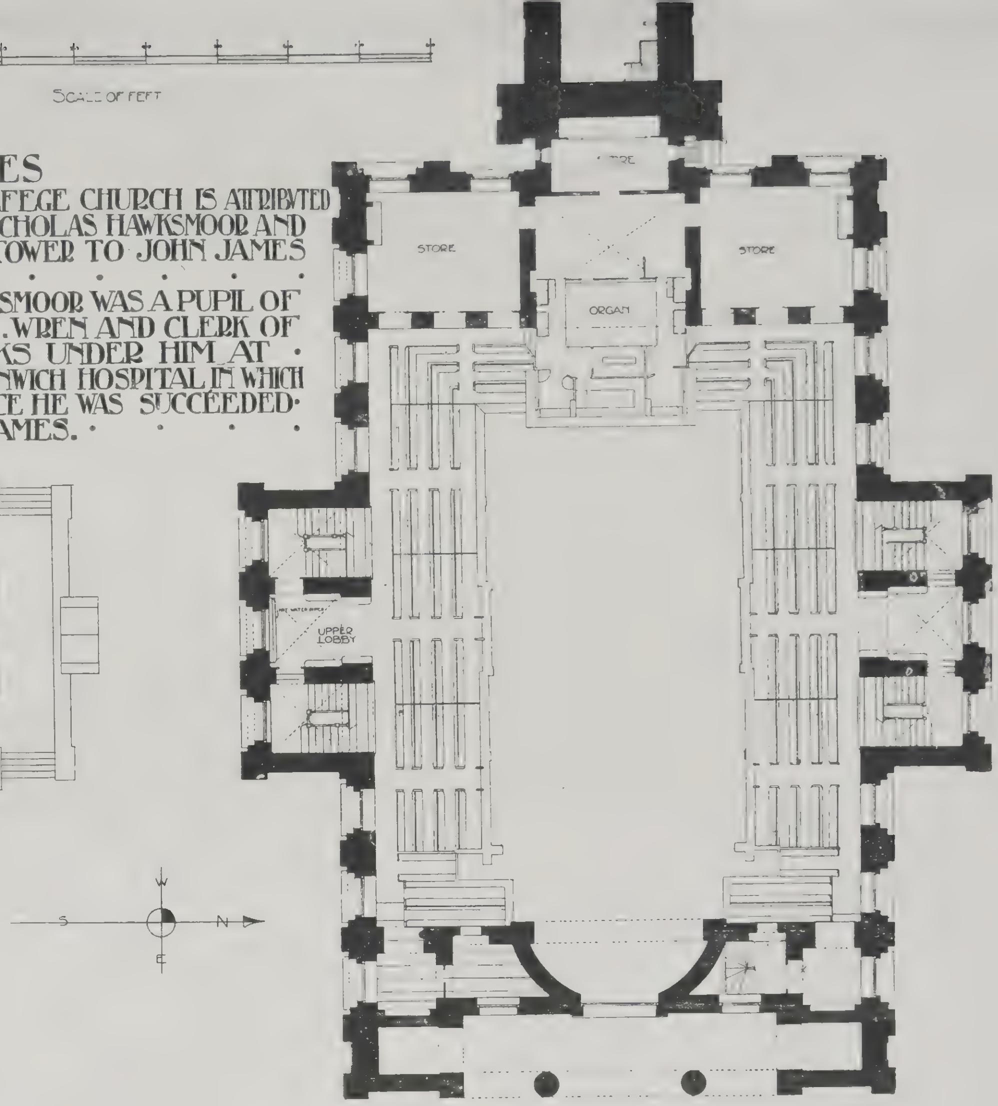


GROUND PLAN.

NOTES

ST. ALFEGE CHURCH IS ATTRIBUTED TO NICHOLAS HAWKSMOOR AND THE TOWER TO JOHN JAMES 1718. • • • • •

HAWKSMOOR WAS A PUPIL OF SIR C. WREN AND CLERK OF WORKS UNDER HIM AT • GREENWICH HOSPITAL IN WHICH OFFICE HE WAS SUCCEEDED • BY JAMES. • • • •



GALLERY PLAN

MEASURED AND DRAWN BY FRANK A. COLLARD.

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A REINFORCED CONCRETE CONDUIT.

We give in this issue some illustrations of work done in 1909 in connection with the water supply of San Paulo, Brazil. In this work a great amount of reinforced concrete was used, and the construction is of a very interesting nature. The scheme was prepared by Mr. L. Betin Paes Leme, the Government engineer of Brazil, and was carried out under the supervision of Mr. Henry Schulman, engineer to the Companhia Mechanica e Importadora de S. Paulo, who constructed and completed the work in ten months.

The two reservoirs are each 56 metres by 39 metres by 4 metres, or 183ft. 8ins. by 127ft. 11ins. by 13ft. 1½ins. in size, and each stores 6,000,000 litres or 1,321,000 gallons of water.

The aqueduct is 12,000 metres, or 39,370ft. long, and the pressure pipes are 4,000 metres or 13,125ft. long, the latter being 1.20 metres or 4ft. inside diameter, and 1.37 metres or 4ft. 6ins. outside diameter, and withstand a maximum pressure of 30 metres or 98ft. 6ins. head of water, the line carrying 500 litres or 110 gallons of water per second.

The pressure pipes, as well as the aqueduct, were constructed in continuous lengths. No. 8, 3-in. mesh, ¼in. by ⅛in. (bare) strands expanded steel of British manufacture was used throughout for the aqueduct. Expanded steel sheets were favoured for reinforcing the concrete, because they did not require skilled workmanship, which was not easily obtained in Brazil.

Reinforced concrete is a particularly valuable system of construction of such work as, owing to the difficulties of transport, only the concrete and cement need be transported.

We give three views showing the work in course of construction, and we would draw particular attention to the construction of the aqueduct by means of a centering of wooden ribs. These ribs were used over and over again, and were easily fixed in position. In a sunny climate, and a country also subjected to torrential rains, a roof over the work was necessary, and our view shows a movable roof that was used as a protection against the weather during the construction.

In constructing the aqueduct through tunnels the top section was moulded separately, and the work was not done *in situ*, except the bottom of the aquehduct, and the fixing of the top section thereto.

Temporary timbering had to be used on the outside of the aqueduct as well as an inner core of centering, this being shown in one of the views.

The reservoir was constructed with cast-iron columns, carrying rolled-steel joists, upon which expanded metal was placed to form a reinforced concrete roof. The floor was also reinforced with expanded metal and round steel rods. The division wall of the reservoir was reinforced with expanded metal.

Some tests were conducted in the preliminary stages of the work upon the resistance of pipes to pressure, and sections were heavily loaded on the top to test their resistance to a superimposed load of earth. The ends of the section were also sealed by large plates, and hydraulic pressure was applied to test their permeability.

We have not the results of these experiments before us, but we are informed that the results were eminently satisfactory, which is substantiated by the fact that after these preliminary trials the work was ordered to be proceeded with.

Reinforced concrete would seem to have entered upon an almost limited field of utility; and the present instance demonstrates very strikingly its ready adaptability to engineering works and methods.

Our Plate.

This shows some measured drawings of the Church of St. Alfege, Greenwich, by Mr. Frank A. Collard. St. Alfege is attributed to Nicholas Hawksmoor, a pupil of Sir Christopher Wren, and clerk of works under him at Greenwich Hospital. In this office he was succeeded by John James, who is reputed to have designed the tower of this church. We shall publish some further drawings by Mr. Collard next week.

Builders' Notes.

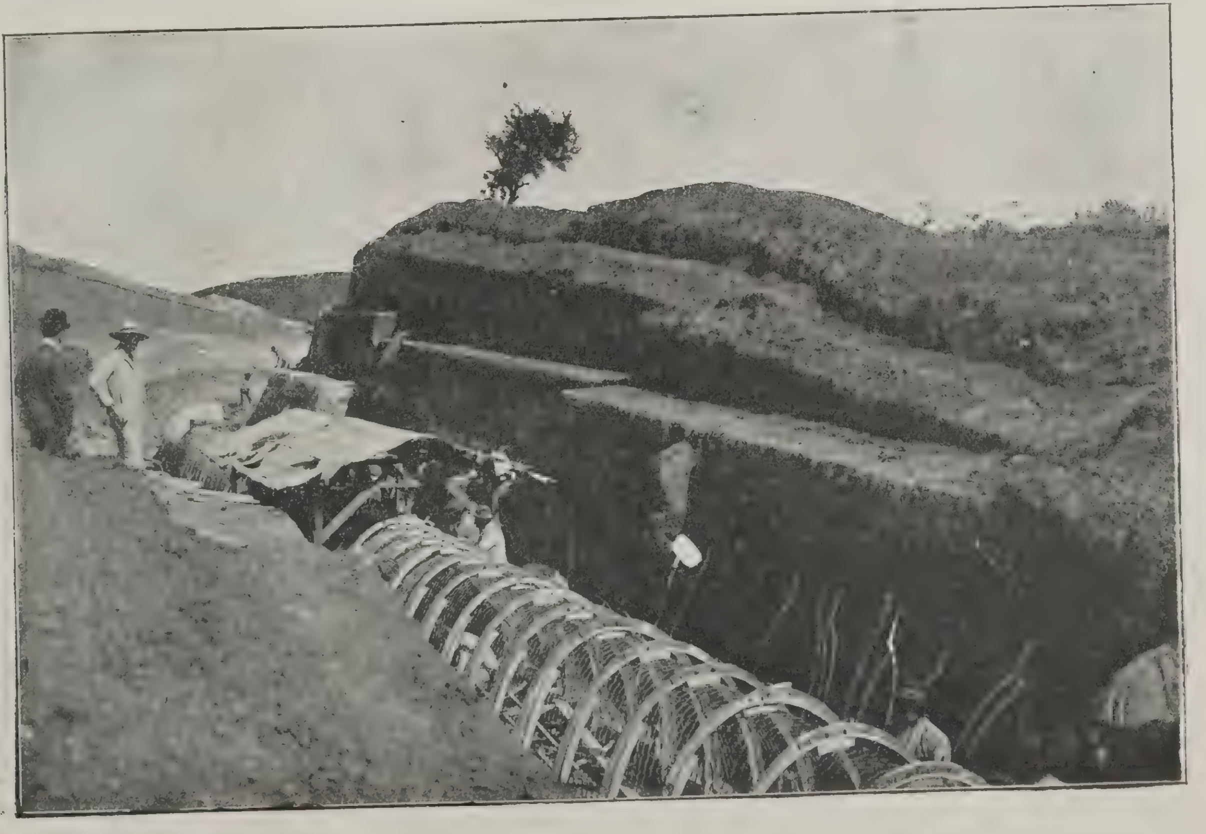
The Cork Master Builders' Association have asked, individually, the unskilled labourers in their employment if they were willing to sign the following declaration:—"We, the undersigned, are willing to obey our employer's orders, and are prepared to go to any establishment in the city where we may be sent on our employer's business." Those who declined to sign were instantly dismissed.

* * *

Leeds Master Builders' Association have had under discussion the provisions in the Housing and Town-Planning Bill that prohibit the erection of back-to-back houses. The opinion generally expressed was that the common strictures on back-to-back houses are not applicable to the style and character of such dwellings as erected in Leeds, and several members urged that it would be disastrous if any hindrance to the erection of dwellings at a reasonable cost were imposed in towns where land is freehold, as rents are necessarily based on the capital invested in the purchase of the land, as well as in the erection of the buildings. Members said that they were unaware of any town in England where the working classes are so cheaply and so efficiently housed as in Leeds. It was resolved to support the Corporation's opposition to these clauses in the Bill.

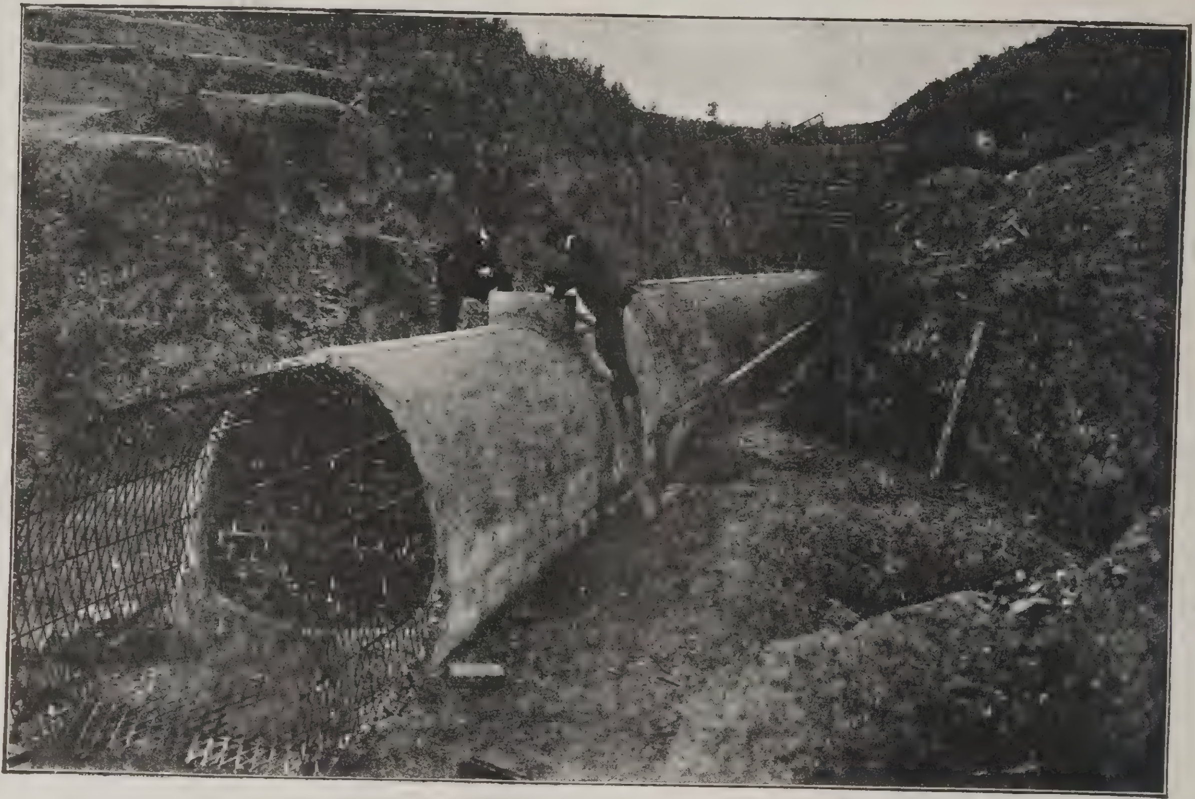
REINFORCED CONCRETE LINTELS.

Artificial stone lintels have been made by builders and others for many years past, and in these lintels, which were really concrete though known as artificial stone, some form of reinforcement or strengthening by the inclusion of steel or iron sections was necessary. The form favoured by builders was to use old bedstead rails or gas-barrel, and in some cases small joists. This iron was placed in the lintels without any real regard to its proper position, and the principles of reinforcing these beams—which in reality they were—were not understood, so that the metal was employed very wastefully. Now that the principles of the reinforced concrete are better known, we find



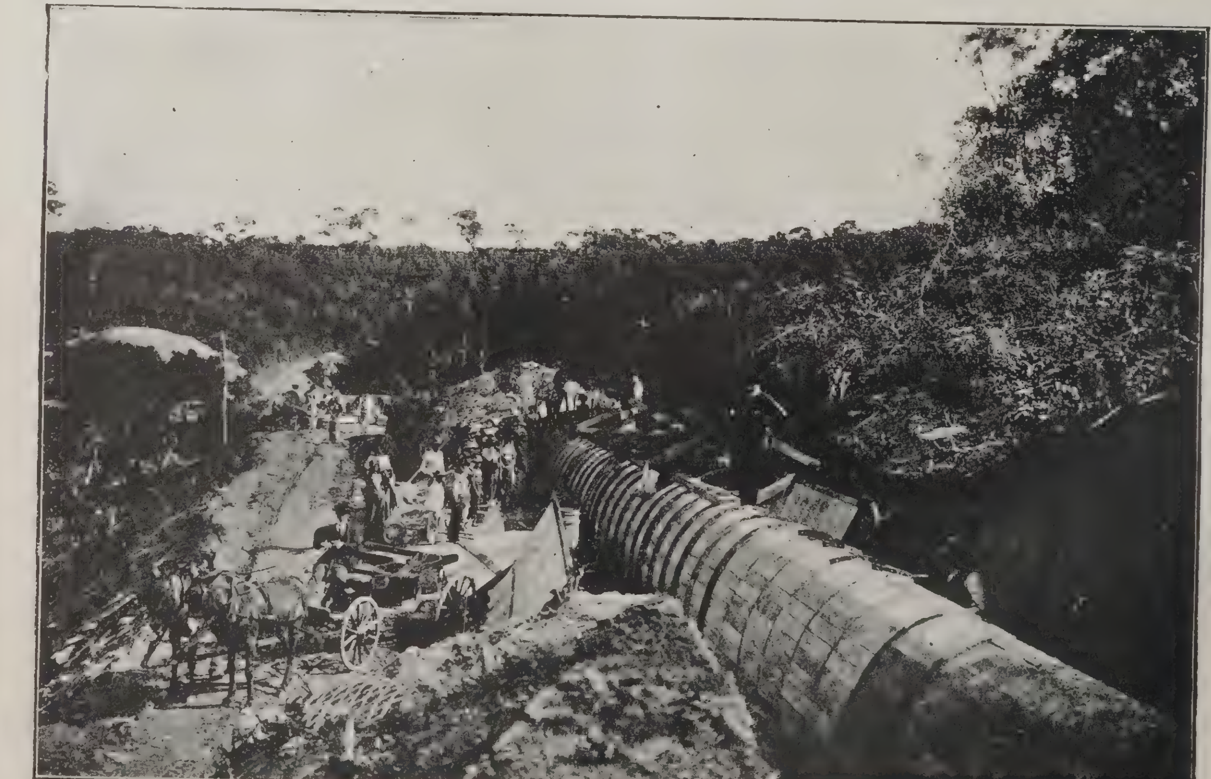
A REINFORCED CONCRETE CONDUIT. SHAPED RIBS FOR TIMBERING.

In constructing this aqueduct, temporary timbering had to be used on the outside, as well as an inner core of centering, and the illustration shows the shaped ribs carrying the timbering. In a sunny climate, subject to torrential rains, such protection is very necessary.



A REINFORCED CONCRETE CONDUIT. MANHOLE.

The view shows a manhole or inspection chamber in the conduit and is very suggestive of the ease with which the system can be adapted to such services.



A REINFORCED CONCRETE CONDUIT. RIBS CARRYING TIMBERING.

On page 53 is a view showing the ribs prepared to receive the external temporary timbering. The present view shows the timbering in position.

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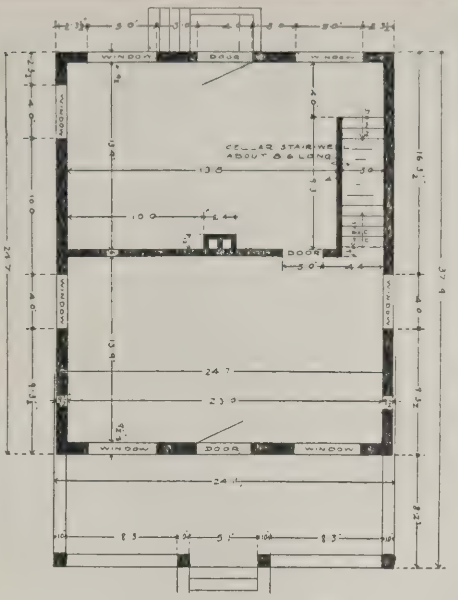
these lintels constructed in a more scientific manner. The Trussed Concrete Steel Company, of Caxton House, Westminster, are alive to the fact that those who make these concrete lintels now begin to appreciate the proper principles upon which to construct a lintel, and they have issued a small catalogue having special reference to the use of the Kahn trussed bars for the reinforcement of lintels. This pamphlet shows how considerable economy is obtained over the old methods of construction by the use of Kahn bars, and a table is provided to show exactly how to apply the reinforcement, the sizes and quantities for lintels with a varying span from 3ft. to 20ft., and carrying loads from two tons to thirteen tons, as also the price of the reinforcement per lintel in each case. This is a valuable table, and will be found of considerable service to those who require to execute such work.

THE EDISON POURED HOUSE.

The Edison poured cement house has been, ever since the announcement of its inception, a stock topic for the alleged humorist. It has supplied him with moulds into which to pour his favourite mixture of ridicule and contempt. To think that ridicule and contempt cannot kill must be tolerably hardy; and Mr. Edison's invention has evidently survived the ordeal, and also that of the indiscriminate praise of such as believe that Mr. Edison's genius cannot err. There were also genuine philosophic doubts as to the practicability of the system. It was supposed that cement would clog when an attempt was made to pour it into intricate moulds; and horror at the idea of a city full of houses, each a fac-simile of the others, was expressed very freely and feelingly.

Mr. Edison, it appears, has anticipated or met these objections. He has produced a mixture that will flow freely into the moulds, and yet will allow of a uniform distribution of the aggregates. Moreover, change of style with the same set of moulds can be arranged; and by the use of half a dozen sets of moulds a wide variety of style is possible.



THE EDISON POURED HOUSE. GROUND PLAN.

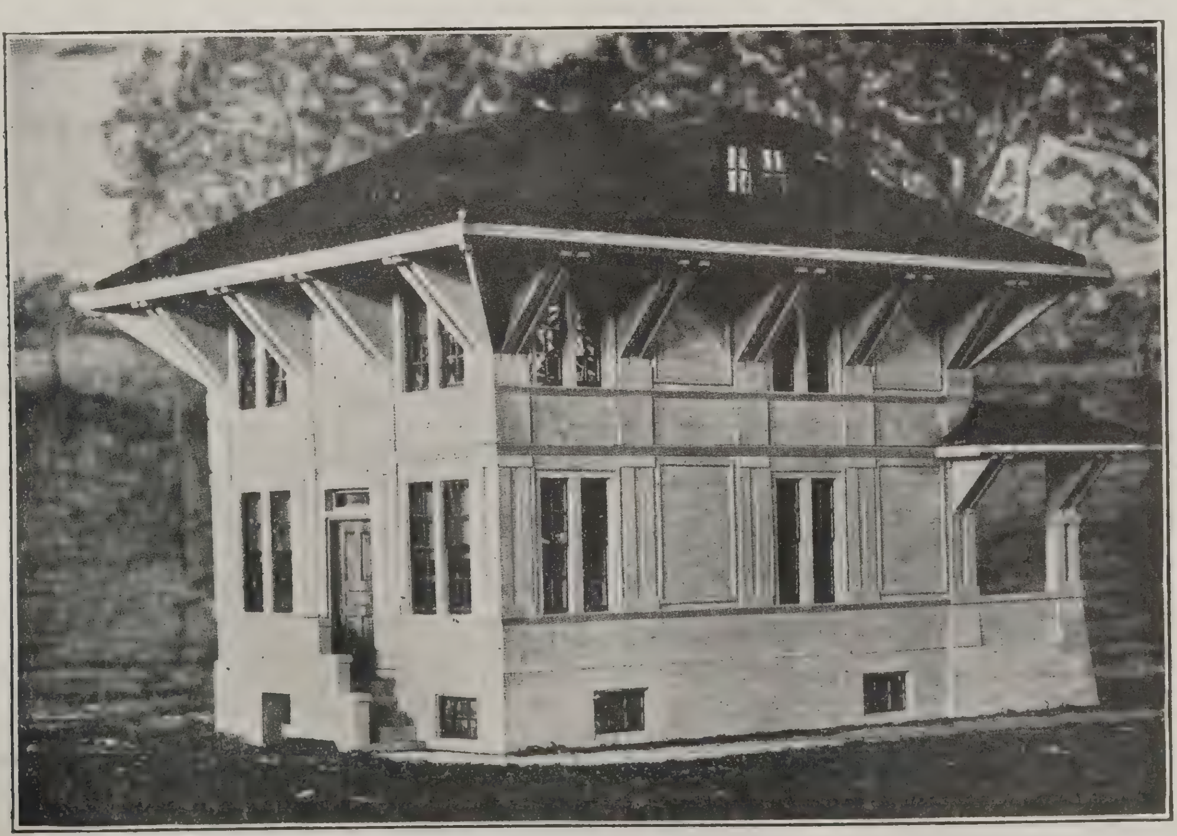
There are two bedrooms and a bath-room on the first floor and two bedrooms in the attic.

The moulds are of cast iron, about an inch thick, and are, of course, assembled and locked together for the pouring. Mr. Edison at first conceived the idea of a two-family house; but he now thinks that a one-family house would be preferable. Such houses, it is estimated, can, if the materials are bought in large quantities, be constructed at a cost of 1,200 dollars. The house would have a floor plan 25ft. by 30ft., and is intended to be built on lots 40ft. by 60ft., so as to give a fair amount of garden room. The front porch extends 8ft., and the back porch 3ft. On the first floor the front room will be 14ft. by 23ft. by 9½ft. high, and is meant for a living-room; a kitchen in the back being 14ft. by 20ft. by 9½ft. high. The second floor will contain two bedrooms, a wide hall, and a bathroom 7ft. 6ins. by 7ft. 6ins. by 8ft. 2ins. high. The cellar, 7ft. 6ins., extends under the whole house, and will contain the boiler, wash-tubs, and coal-bunker. The main room, as well as the outside of the house, will be "richly decorated," the decorations being cast as an integral part of the structure. The house, in fact, will be monolithic, and there will be no plastering, the surface left by the moulds being perfectly smooth, and capable of taking paint.

In constructing the house, the first step is to prepare a concrete foundation or footing, which, with the basement floor, must be thoroughly set before the moulds are placed in position. Regulation reinforcing rods can be used in the moulds, and all gaspipes, etc., are placed in position when the moulds are set up. The erection of the moulds will take about four days, but the pouring of the liquid will occupy no more than six hours. Four days after the pouring, the dismantling can be done, and six days more are allowed for the hardening of the concrete. A house, therefore, can be completed in about fourteen days.

Mixers of extra-large size will be used, and the concrete, after being mixed, will be placed in large tanks, from which it will be conveyed to a distributing tank on the roof or top of the forms. Numerous open troughs or pipes will conduct the mixture to various openings in the roofs, whence it will flow down and fill all parts of the moulds to the footings in the basement, until it overflows at the top of the roof. As the pouring proceeds, the mixture is agitated to prevent congestion of the materials. The great feature of the invention is the composition of the liquid, which, while it flows like water, and fills all interstices, is nevertheless a true concrete. A complete set of moulds will cost about 25,000 dollars, and the necessary plant will increase the expense by 15,000 dollars.

Mr. Edison's assistants in the exhaustive experiments—covering a period of eight years or so—are Mr. George E. Small, from Philadelphia, and Mr. Henry J. Harmes, who was formerly in the service of the British Government in India.



THE EDISON POURED HOUSE.

Mr. Edison claims that he has produced a mixture which, while flowing freely into the moulds, will allow of a uniform distribution of the aggregate. The depth of the overhanging eaves is perhaps necessitated by the arrangements for pouring.

PRACTICAL CONCRETING.

Matrix and Aggregate.

Architects and engineers have long recognised the importance of good quality in the concrete used in all constructional work, and stringent specifications are often met with dealing with the class of matrix and aggregate to be employed, and the proportions in which these are to be gauged. Clerks of works, who really are the inspectors of the quality of materials to be used, are bound to be particular in their supervision under such conditions; and, in fact, it is not uncommon for contractors to complain that some clerks of works are more exacting in their requirements than the specification warrants; too often, it is whispered, because the clerk of works is young and inexperienced, and hopes to please the architect by a show of zeal.

Disregarding, however, the personality of the clerk of works or inspector, there is no doubt that one of the most important items requiring constant supervision is concrete making and placing, no matter what position it is to occupy in the work, nor is there any doubt that an incomplete or a faulty specification for concrete work is a curse to the contractor and the architect alike, as it gives, on the one hand, opportunities to the unscrupulous contractor to scamp his work, and on the other, affords an exacting clerk of the works opportunities to worry a conscientious builder unnecessarily.

A word first, therefore, on the materials forming the concrete. If the matrix, or cementing material, is specified of standard quality, it is all that can be desired. As regards the aggregate materials, the architect's specification should be exact as to their requirements.

Cement Specifications (Normal).

A clerk of works would be perfectly certain to get from the contractor all the architect could desire, if the whole of the cement used on the works were required to be "best, highly-burnt, pure Portland cement, to conform exactly to the terms of the British Standard specification."

With such a cement, properly employed, no unsatisfactory work could result.

Extra Precautions.

But if any extra precautions are deemed advisable for specially important work, the contractor should be required to provide at some convenient part of the site a suitable shed, or other approved building, having a damp-proof floor, with all necessary subdivisions, so that each consignment of cement may be kept separate; the shed being of sufficient size to contain such quantity as the architect or clerk of works may order to be kept in store.

All cement before being used should be spread upon this floor in a layer not exceeding 12ins. in thickness, and allowed to remain at least 14 days, or for a longer period if the condition of the cement requires it, the contents of the various bags or casks being thoroughly mixed with each other in spreading out on the floor, and the cement should be turned over from time to time as the clerk of works may direct.

The contractor should take precautions to keep all cement dry, and provide all necessary waterproof sheeting or tarpaulins for the protection of the same on the works.

The contractor should always keep sufficient stock for 14 days' requirements at least, and, with each delivery of cement, he should be required to furnish the architect or clerk of works, in writing, particulars of the quantity sent in, the maker's name, the date when taken from the kiln, and have samples taken from the consignment, in the presence of the representative of the architect, for testing purposes, and deliver the same at the office of the latter, properly marked and labelled.

The cement should be tested by the architect, and all that fails to comply with the above-mentioned standard should be rejected and forthwith removed from the site at the expense of the contractor. An average of three briquettes should be considered conclusive. No cement should be used until after being tested.

This is the one I prefer — E

THE EDISON POURED HOUSE. DECORATIVE DETAIL.

This is Mr. Edison's favourite decorative design.

The first consignment of cement should be put in store immediately after the signing of the contract for the purpose of testing, and the architect and clerk of works should have free access to the store at all times, and be at liberty to take samples of cement when they might desire.

But no matter how exactly a specification is written concerning the materials, inferior concrete may result from bad workmanship in the making, mixing, depositing, ramming, etc., all of which faults could be avoided with proper care and supervision.

Aggregate Specifications.

As to the aggregate, the specification should demand a perfectly clean and hard material, one readily obtainable and near the site of the work, and graded in size according to the bulk and character of the work in hand. If the specification is vague on the point of the materials, and the clerk of works is to be the arbiter of the quality of those supplied, it is not at all unilkely that grave injustice may be done to the contractor, or that some very peculiar substances may be brought on the site for aggregate. On one occasion, when visiting an important concreting job, we arrived in time to see four yard-cart loads of old pantiles brought to the site as aggregate for concrete. The contractor evidently had some buildings to demolish close by, and rather than cart the waste materials away to a tip, had hoped to utilise them on his neighbouring job for the purpose mentioned. They were black with age, covered with soot, moss, and even small fibrous roots. The only point in their favour for the purpose the contractor had in view was their hardness, but otherwise their dirty condition and similarity of shape (even when broken up to pass the specified gauge) was sufficient reason to reject them out of hand. Old drain pipes, slimy when wetted; old bricks, previously used for flues and coated thickly with soot; and old concrete, made originally of weak lime, and now crumbling at the touch, are some of the materials brought forward as substitutes for good ballast, etc., and if the clerk of works is inexperienced, and the specification weak or vague, such materials may find their way into the new work, to the detriment of its stability.

Aggregates: Various Non-absorbent Materials.

When the proportion of the cement is low, aggregates of a non-absorbent character make better concrete than pervious ones. River gravel, when obtained from sluggish streams, has often fine muddy clay, washed in from the banks, attached thereto. This should be eliminated by washing. Thames ballast, for instance, is not always of one character, as every London builder knows. It depends from what part of the river it is obtained.

Old tiles, slates, and similar materials, are unfit for aggregate for concrete. They are unshapable, and impregnated with smoke and impurities.

Clay, if thoroughly and uniformly burnt, is a good aggregate. Much depends upon the quality of the clay, and the skill of the burner, but in all cases it is one of those aggregates that require washing, as it is as a rule covered with a film of impalpable dust, and, moreover, has to be screened or broken to a suitable size.

Old bricks from buildings in course of demolition make good concrete if broken with a crusher, but not if handled, while if smoky and soot-laden, they should only be used in foundations. If used for walls, floors, or ceilings, where the latter are formed by plastering direct on the concrete, stains will inevitably appear in course of time.

Slag.

Slag, unless it has been allowed time for aeration by exposure to the atmosphere for a year at least to get rid of the sulphur it contains, will disintegrate the concrete; failures have happened from using slag not sufficiently aerated, otherwise it is a good aggregate.

Thames Ballast and Coal.

Thames ballast and sand often contain pieces of coal which may have been thrown overboard, or in some other way got mixed therewith. In such cases the aggregate is extremely unsatisfactory for concreting purposes, as the coal is bound to expand and disintegrate sooner or later.

Size.

To obtain the greatest resistance in concrete it is advisable to increase as much as possible the size of the aggregate and sift out the finer grains. The largest aggregate makes the densest concrete; an aggregate having a maximum diameter of 2¼ins. proved to be denser than an aggregate of 1in. maximum diameter. This result is just the reverse to what has been taken for granted ever since concrete has come into general use. Again, permeability is less as the maximum size of the aggregate is greater; concrete with a maximum size aggregate of 2¼ ins. diameter, is in general less permeable than with a 1in. maximum diameter, and 1in. maximum less permeable than ½in. These results were arrived at from a large number of experiments, and are opposed to all theory, another proof that theoretical deductions in matters dealing with concrete must be received with caution.

Cleanliness.

Clean, and preferably washed, aggregate is essential for satisfactory concrete. The materials may not under any conditions be dirty in themselves, in the sense of fitness for an aggregrate, but all materials that have been crushed by a machine, broken by hand, or passed through fire, are covered with a film of impalpable dust, which is harmful to cement. The value of Portland cement is much lessened by coming in contact with deleterious substances, much more so than lime; dust is one of them, and fine sand or grit is another.

A dirty sand with a rounded grain, and containing clay or earthy matter, is still another undesirable aggregate.

In the washing of brick *debris* as an aggregate, there will be noticed a thick red pasty mass containing nothing that is necessary to retain in the aggregate, but much that is harmful in concrete work made with such a material.

Avoid Proximity of Lime.

Some aggregates, conveyed by rail, have been placed in trucks used for the conveyance of lime, portions of which have got intermixed therewith, and, being unnoticed, have caused the concrete to blow or burst. The aggregate for concrete should not be deposited near a lime shed, nor where plasterers are running lime for plastering, as pieces of unslaked lime or lime core may inadvertently find their way among the concrete material. Numerous failures have occurred through pieces of lias limestone having passed through the furnaces of locomotives and got mixed with the ashes, which were afterwards used for making concrete. In one case a large flight of concrete stairs and floors was completely wrecked as a result of this.

Sand Should be Selected.

The sand should be carefully selected for the purpose, as all kinds are not equally suitable. It should be highly silicious, and of sharp angular grain, and if contaminated with clay or soil must be well washed before use. If the mixture is to be specially waterproof the sand particles should be 1-75th to 1-25th ins. in diameter for the facing and 1-25th to 1-6th ins. for the filling, when the cement is used for thin walled vessels. If the walls are over 2½ins. thick coarser aggregates, with particles up to ½in. diameter, may be used. Even then they should be as angular as possible, and of such sizes as to fit as closely together as possible, with a minimum of voids, in order to produce a perfectly waterproof mass.

5.—Proportioning of Ingredients.

One of the most important points in concrete making is the proper proportioning of the ingredients. The particular proportions should be defined in the specification, and for this purpose proper gauging or measuring-boxes must be brought into use. The capacity of the one for measuring the cement will be proportional to the volume of the aggregate to be used, and is best made with a bottom to it, so that the cement may be placed on top of the aggregate after measurement. That the boxes are of the correct capacities the clerk of works will have beforehand determined for himself. The supervision of concrete must be constant, for which reason the mixing should take place in full view from the window of the clerk of works' office; if this is impossible, the clerk of works should be always outside whilst the mixing is taking place. and at this time the hours of the clerk of works should be those of the workmen.

(To be concluded.)

CONTRACTORS' USE OF COAL: A SCIENTIFIC SYSTEM OF BUYING.

By a Contractor.

(Concluded from page 34, No. 753.)

Method of Payment by Results.

The results of experience thus far set out seemed to demand some simple and practical method whereby uniformity of steam raising value could be obtained. Reference to the results of testing various consignments, shown in Table A, establish that 70 B.T.U. per penny of cost per ton was a reasonable basis for future orders. Table B shows the results of orders thus placed. Various coal merchants were given the option of supplying any coal they like at costs ranging from 13s. 9d. to 15s. per ton, including delivery. In the case of coal L., the delivery price of which was 13s. 8d., the number of units stipulated were 11,480 (this figure is arrived at by multiplying 70 by 164, the number of pence in 13s. 8d.). The order provided that 1d. would be deducted from the cost per ton for every 70 units less than, or 1d. per ton added for every 70 units more than 11,480. The consignment thus supplied to this order proved on test to afford 11,700 units—*i.e.*, 220 in excess of the stipulated amount. The merchant therefore received an extra of 3d. per ton on the basis price. In the case of coal M, costing 14s. 10d. per ton, the number of units stipulated was 12,460. The units ascertained on test amounted to 12,263, and 3d. per ton deducted was from the invoice. The table shows other results of a varying kind.

As the coal market rises and falls, the basis of units per penny will rise and fall, but many contractors make periodic contracts at a fixed price, so the basis needs to be reconsidered only at fixed intervals.

It is to be remembered, of course, that the 70 B.T.U. per penny refer only to the contract under review. Each contract must be taken on its own merits, and a fair basis reached by experiment on two or more coals. Once started, however, the system becomes automatic, and gives no more extra labour than if buying were done in the old way.

Sampling for Tests.

It is clear that where the price paid is calculated on the number of B.T.U.'s established by test, it is of great importance both to buyer and seller that the sample tested shall be a perfectly fair one. In America the importance of paying on test is so largely recognised and employed that there exists, in the Fuel Engineering Co., of Chicago, an undertaking which samples and tests on behalf of both buyer and seller, and the report of this company is accepted by both as final. There is little doubt that some such organisation will come into being in England when the obvious fairness of this method of purchase becomes more generally recognised. Meanwhile, there are two methods which can be adopted: (1) that the representatives of the buyer and seller shall meet at the point of delivery and select a fair sample, and shall despatch it direct to the testing laboratory; or (2) that the buyer and seller shall jointly instruct the testing laboratory to send a representative to take a sample. The former should be quite satisfactory, but the latter removes any possibility of dispute, and its only disadvantage lies in the increased cost of testing. There is, of course, the third method, that the seller should rely on the honesty of the purchaser to select a fair sample, and this has been the method employed in the purchases described in this article. Such a method, however, can only be employed where the seller has perfect confidence in the uprightness of his customer. Ten pounds of coal is the ordinary amount sent to a testing laboratory, and this should be made up of small pieces of coal taken from different trucks (if it be railborne), and from different parts of the barge (if it be water-borne), and the different pieces should be taken from the top, middle, and bottom of the truck or barge. A handful of slack should be added of the same proportion to the large coal, as is the case with the whole delivery. The testing is done with Thompson's calorimeter, and it is important that the work should be carried out by thoroughly experienced men, in a laboratory of high repute. The tests described in this article have all been carried out at the testing works of an inspecting engineer, who works for several Government departments, and whose competence and impartiality are beyond dispute. There are, however, many other laboratories of high repute, any of which will undertake the work.

Cost of Testing.

It is often alleged by the practical man, who is suspicious of the undue intrusion of science into commerce, that the cost of scientific tests is greater than is warranted by the value of the results. Such a case, however, cannot be made out against coal-testing. The cost of a test for moisture, ash, and calorific value is only one guinea per sample. If one sample be taken on every 100 tons, the cost is about 2½d. per ton.

Cash Saving Secured by Scientific Buying

When all is said, the merits of any new business method must be measured by the actual saving of money which results. This article sets forth the results of a contractor's experience in respect of coal-buying for one contract only, where the consumption of coal is about 100 tons per week. Buying was done in the early stage of the contract in the ordinary way, by selecting coals which had been bought before, and which are habitually used by well-known contractors, whose judgment in such matters ought to be sound. When the practical man on the works spoke well of the coal so bought, there seemed every reason to be satisfied that the full value was being obtained. However, by experimenting with a variety of other coals, and gradually eliminating those which gave a low value in B.T.U. per penny per ton, and by establishing a standard of B.T.U. below which the coal must not fall, a saving of £10 per week has been effected. This saving, considered in relation to the value and duration of the contract, amounts to one per cent. on the gross value of the contract. To achieve such a result on a single item of the varied channels of expenditure seems well worth the very little time and trouble which is involved in buying coal in a scientific way.

As coal merchants come to see the essential fairness of this method of purchase, there is no doubt that there will be competition to secure orders by offers to buy on a higher basis of B.T.U., and the saving on the present method of buying will be proportionately increased. As it is thought that other contractors may like to follow the example of the firm whose experiences are recorded above, the Editor will be pleased to answer questions in these columns and to put contractors in the way of reorganising their coal-buying on an economical basis.

TABLE A.

Results of tests taken on various representative coals, to enable purchaser to establish number of British Thermal Units per penny per ton, which should be obtained and fixed as the basis for future contracts and payments.

Reference.	Moisture Percentage	Ash Percentage.	British Thermal Units.	Price per Ton Delivered to Site of Contract.	Units per Penny Calculated on Analyses Supplied by Colliery where Known.	Units per Penny Based on Tests made by Laboratory for the Contractor.
A	13·60	5·85	11,520	14/6	76	**66**
B	16·11	7·09	10,440	15/-	72·5	**58**
C	12·07	2·92	11·947	16/4	64	**61**
D	11·04	19·67	9,562	12/6	..	**63·5**
E	12·05	3·05	12,465	15/6	..	**67**
F	15·39	4·69	11,565	15/10	64	**61**
G	10·00	3·74	12,960	17/-	63·7	**63·5**
H	7·24	1·95	13,365	16/7	..	**67**
J_1	12·00	1·97	12,825	14/4	..	**74·5**
J_2	15·02	6·10	11,520	14/4	..	**67**
J_3	10·84	1·98	12,267	14/4	..	**71**
K	12·48	1·87	12,420	14/9	..	**70**

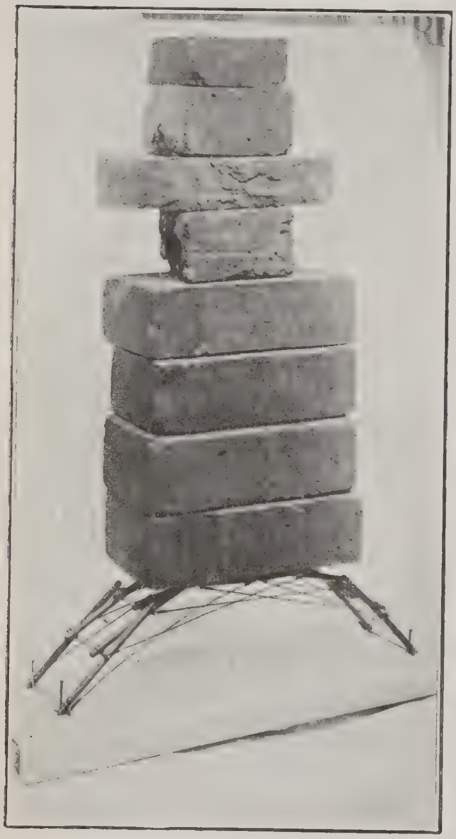
TABLE B.

Results of tests taken on various coals, which were bought on a sliding scale of price, based on the British Thermal Units yielded on test of samples from consignments delivered. The stipulated units are arrived at by multiplying the number of pence per ton by 70.

Reference.	Moisture Percentage.	Ash Percentage.	British Thermal Units Ascertained.	Price per Ton.	B.T.U. Stipulated.	Difference between B.T.U. Ascertained and Stipulated.	Addition to, or Deduction from Basis Price per Ton.
L	14·22	4·68	11,700	13/8	11,480 (164×70)	+220	+3d.
M	11·42	4·51	12,263	14/10	12,460 (178×70)	−202	−3d.
N (average of 3 tests on large shipment)	11·7	6·72	12,054	13/8	11,480 (164×70)	+574	+8d.
O	15·06	5·18	11,565	15/-	12,600 (180×70	−1035	−1/2
P (average of 3 tests on large shipment)	11·91	4·38	11,857	14/9	12,390 (177×70)	−533	−7½d.

A TRANSPORTABLE BRIDGE.

We have received some particulars of a system of bridge construction which has been devised by Mr. Reginald C. Fry, architect, of 12, Clifford's Inn, E.C. This system, which has been provisionally patented, is decidedly ingenious. The proposal is to build up a bridge by means of standard bars consisting of compressional members, tie-rods, and cross-bars. These are used for the construction either of trussed girders or of trussed arches. The connections of the standard pieces consist of holes in the compression members in which the cross-bars are inserted, and the eyes of the ties are placed on the ends of these cross pieces. Certainly models show that a bridge or girder can be constructed very quickly by the use of such standard members. The cross-bars are prevented from slipping out by the insertion of small pins, but there is apparent the lack of rigidity which might be expected where riveting is not employed. Therefore the system loses the advantages attributable to rigid connection. Certainly Mr. Fry's idea could be used for the construction of a bridge such as might be required by soldiers, as it is very quickly built up, while the standard pieces could certainly be easily transported. Mr. Fry advocates the adoption of his system for War Office purposes. On the face of it the system seems to have advantages. Though the transport would not be particularly difficult, at the same time the standard sections would be heavy to handle, and standard timbers would be preferable. His standard sections do not seem to us to be economical of material. We refer more particularly to the compression members, almost half the weight of which is wasted theoretically, having regard to the amount of metal required to meet the stresses imposed, while in the form of arch construction proposed there is very little rigidity in a large span.



Mr. Fry suggests the use of this system of construction for the purposes of forming a centreing for the construction of concrete or reinforced concrete arched bridges, the idea being that these standard bars might be stocked by a contractor.

Mr. Fry has issued a small descriptive pamphlet which makes many claims for the system, but we should like to see practical proof of the advantages. Certainly the models that have been built on Mr. Fry's principle show considerable strength, but if they are analysed it will be seen that the strength is not really extraordinary if we have regard to the resistance of the materials and the manner in which the structure is framed up.

BUILDING AND THE FINANCE BILL.

GROWING OPPOSITION.

The Stoppage of Building Work.

Now that the actual intentions of the Government with regard to the taxation of land are becoming more widely known through the debates in the House of Commons, the building industry is beginning to appreciate what it means; and strong and increasing opposition to the Finance Bill is indicated on all sides. At the end of June, Mr. Howard Colls, of Colls and Sons, the well-known firm of builders, stated to a reporter of "The Daily Telegraph":—"The fear of this Budget has already had an enormous effect in stopping building work of all kinds, and now that it has been put into shape it will still further accelerate and intensify this holding-up of building operations." The state of the building trade was, he stated, worse than he had ever known during the summer months. Work was being stopped and postponed in all directions. If the Government had had a "mandate" so to frame the Budget as to throw men out of employment they could scarcely have done more. It was generally known that in the aggregate the number of men employed in the building trade was far greater than in any single trade throughout the country.

A correspondent in "The Morning Post" of June 28, mentioned the difficulties attendant on mortgaged property. Many are now being called in, and there is little hope of re-mortgaging since the Finance Bill was introduced. Says this correspondent:—"There can be no question but that the building trade will be permanently injured. For many years land and property generally have been depreciating in value, and just as the property market is on the turn it receives this "knock-out" blow. Building work is being stopped or postponed in all directions."

An Architect's Views.

The opinion of a well-known London architect also appears in "The Daily Telegraph" of June 28th. He says that the present panic involves a distressing period of unemployment for thousands of skilled workmen. With all the terrors of this measure facing him, the City man who is about to retire, buy a little estate in the country, build a comfortable house at from £5,000 to £10,000, and become a solid asset to the country, says to himself, 'No, it's not good enough; the responsibilities are too great, and I don't know what sort of taxation I shall be let in for in the future.' "Take, too, the case of a man who seeks to buy a piece of land for his personal occupation. He wants to know that he is buying it with some definite charge, but under this Budget he is in a state of great uncertainty. The old land-tax was redeemed by a good many people, but now things are almost as bad again. I know myself of one instance in which several houses were to have been put up, costing about £12,000. They were dropped through fear of the Budget. Another scheme for building a gentleman's house in the country for £6,000 was given up, and a like fate befel a proposed alteration to a gentleman's private residence, at a cost of £8,500. Sir G. Hayter Chubb announced some time ago that contemplated building operations, to cost some £10,000, were abandoned, and Lord Redesdale, who was interested in some brickworks, stated that two contracts of £10,000 each were dropped, so he was informed by the contractors, in consequence of the Budget. These are but a few actual instances of what is taking place all over the country." Many country builders of the better class had told him that they had never been so slack as they were to-day.

The Surveyors' Protest.

The Surveyors' Institution has drawn up a pamphlet in which they say of the increment value duty, that:

"The imposition of this duty will seriously affect the value of land of every description throughout the country, as investors will naturally prefer to place their capital in securities where they will not run the risk of losing one-fifth of any increased value.

"The Finance Bill has already had a deterrent effect on the letting of building land, and some of the signatories have experienced instances where contracts which were on the eve of completion have been annulled on account of the cumulative taxes proposed.

"The cancelling of these agreements will cause an enormous amount of unemployment in the building and allied trades."

The Queen's Hall Protest Meeting.

A large protest meeting of gentlemen having a practical interest in real estate, was held at the Queen's Hall, London, on July 13, and amongst those present were Mr. John Wood (president Land Agents' Society), Mr. Stenning (president, Surveyors' Institution), Mr. J. M. Beale (past-president, Incorporated Law Society), Mr. Howard Martin (past-president, Surveyors' Institution), Mr. J. Howard Colls (past president of the Institute of Builders and of the London Master Builders' Association), Mr. F. G. Rice (president London Master Builders' Association), Col. Raikes (past-president Land Agents' Society), Mr. Peter Davies (president, Estate Agents' Institute), and many others.

Mr. E. G. Pretyman, M.P., moved: "That, in the opinion of this meeting, the proposals for taxation contained in Clauses 1 to 28 of the Finance Bill, 1909, are destructive of security, financially unsound, arbitrary in administration, unconstitutional in form, and unworkable in practice, and that such proposals will tend to increase unemployment, especially in the agricultural and building industries, and arrest the provision of improved accommodation for the working classes."

Mr. Howard Martin, supporting this resolution, entered an emphatic protest against the suggestion that the tax would reach the rich and let the poor escape. It would fine the rich, but might ruin the poor by checking the building trade (and thus increasing unemployment), by ultimately raising the rents of small dwelling-houses, by depreciating the value of investments in which the thrifty had put their savings, and by causing severe financial difficulty to tradesmen and others owing to the calling in of mortgages.

Mr. J. H. Colls also supported the resolution, and said that if the Government had been given a mandate to produce unemployment they could hardly have gone to work more effectively.

The resolution was carried unanimously, and it was resolved to send copies to the Chancellor of the Exchequer and to each member of both Houses of Parliament.

The Dulwich College Estates.

Mr. Edwin T. Hall, F.R.I.B.A., chairman of the Estate Governors of Dulwich College, writes to "The Daily News" of July 17th, replying to a correspondent of that paper who stated that:—"Right in the middle of South London, with built areas on every side, the Trustees at present think it their duty to hold up 480 acres of land," which is "allowed to waste." Mr. Hall points out that there are "other large areas of uncovered land in Norwood, Streatham, and Penge."

With regard to a suggestion that "the building trades will be benefited," Mr. Hall points out that, according to the last official statistics of the boroughs of Camberwell and Lambeth (in which the uncovered land is situated), there are vacant, within the two boroughs, 4,670 houses, representing a loss to the rates of £65,975 per annum." He argues that the sale must be to some hypothetical buyer who is prepared to sink the following sums:—In land, £200,000; in covering 400 acres with 3,000 houses, costing with fences, etc., at least £400 each, £1,200,000; in road and sewer making, £100,000, and in loss of interest during development, £120,000; a total of £1,620,000.

"Having thus placed 3,000 new houses within an area where there are at present 4,670 to let (continues Mr. Hall) purchasers are to be found. Are the houses to be 'held up' until they can be sold to cover their cost with an addition for profit—i.e., the remuneration of the men who have supervised the laying out and building of the houses, or are they 'there and then' to be sold at whatever price can be obtained for them?"

Mr. Hall goes on to say that the Governors are laying out the estate on a definite "town planning" scheme, that they will not allow overcrowding, and that they insist that the houses shall be built on hygienic principles. "The Governors," he says, "do not contemplate allowing the whole of their 480 acres to be built on, nor even the 400 suggested by your correspondent, but only about 320 acres, the remainder it is proposed to keep open, part as beautiful woodlands, part in oases of eight to twenty acres, interspersed all over the estate, as lungs and playing fields for the inhabitants; thus preserving the amenities of the district and carrying into practice the best features of 'town planning.'"

NATIONAL ASSOCIATION OF MASTER PLASTERERS.

A specially convened meeting of the Executive Council of the National Association of Master Plasterers took place at the Moseley Hotel, Manchester, on July 7th, when an invitation having been also given to the members of the Manchester Master Plasterers' Association to attend, a good representative meeting was the result. The President, Mr. Thos. Lindley, of Barnsley, occupied the chair.

The business of the meeting was to consider, approve, or otherwise, the proposed alterations and additions to the National Agreement between the National Federation of Building Trade Employers, National Association of Master Plasterers, and the National Association of Operative Plasterers. The several variations and additions were explained to the meeting by the president, Mr. J. W. Sugden, past president, of Bradford, and Mr. J. C. Warring, past president, of Sheffield, who were among the representatives of this association upon the Joint Committee, and also by Mr. J. B. Johnson, of Liverpool, a member of this association, and a representative of the Lancashire and Cheshire District of the Federation. A general discussion took place upon the merits of the proposed additions, and satisfaction was generally expressed at the results obtained. It was also pointed out to the delegates that the operatives' representatives had met the employers in a spirit of conciliation, and with the avowed desire to become parties to an agreement that could only tend to the benefit of all parties concerned.

Upon the proposition of Mr. L. Stead, of Bradford, seconded by Mr. J. Gibbons, of Manchester, the secretary was instructed to convey the following resolution to Mr. A. G. White, Secretary of the National Federation: "That this meeting of the Executive Council of the N.A.M.P. instruct their president, Mr. T. Lindley, to attach his signature to the new agreement, as drafted and agreed to by the representatives of the several bodies concerned, on behalf of the members of the N.A.M.P."

A further discussion then took place upon matters generally concerning the trade, but in particular upon the question of sub-contractors' agreements, which it was agreed to leave in abeyance, it being understood that at the next meeting of the N.F.B.T.E. several forms would be submitted, with a view of selecting one that would meet the general requirements of the different branch trades connected with the building trade.—Geo. Soall, Secretary, 100, Lodge Road, West Bromwich.

Federation News.

Northern Counties Federation of Building Trades' Employers.

A quarterly meeting of the Board of Representatives of the Northern Counties' Federation was held at the County Hotel, Westoe, South Shields, on July 9th, Mr. John Davison, president, in the chair, when 44 members were present.

Previous to the meeting, the members were received at the railway station by the officials of the South Shields Association, and were driven by brake along the sea front, thence to the new municipal buildings (Messrs. Neill, contractors), where they were shown over the building by Mr. Yeoman in the unavoidable absence of Mr. Neill.

The minutes of the quarterly meeting held at Middlesbrough on April 15th, which had been published in "The Builders' Journal" were read and were signed as correct.

The Secretary reported that the Darlington Association had still under consideration the question of affiliation with this Federation, and he was awaiting a communication from them.

The Executive Council's report upon the question of the workmen's compensation insurance was received and adopted.

The agreement between this Federation and the Federated Employers' Insurance Association, Ltd., Manchester, was read, and, on the proposition of Mr. W. T. Weir, seconded by Mr. R. Johnson, it was unanimously agreed to, and accordingly signed by the president and the secretary on behalf of the Federation.

The representatives of this Federation upon the Advisory Board established under the agreement were appointed, viz:—J. Proud, president, Teesside Association; R. J. Huntley, president, Sunderland Association; and W. T. Weir, president, Tyne and Blyth district.

The Secretary reported that the question of amendment to the National form of contract would be mentioned at the half-yearly meeting of the National Federation. The amendment put forward by the R.I.B.A., and conditionally agreed to by the London Institute of Master Buildings, with respect to Clause 30, would also receive consideration.

A letter addressed by the different sub-contractors and traders to the Northern Architectural Association asking them to consider the advisability of having direct contracting, was read and laid on the table.

The Secretary reported that he had written to the architect for the alterations and additions to the Auckland Union (who required the return of the bill of quantities before returning the deposit) pointing out that this is not usually asked for, as the bills of quantities contain the figures and prices from which the tenders are made up, and the architect was asked to return the deposits without enforcing the condition attached to the advertisement. It was pointed out that such conditions tended to hamper open competition for work.

The Executive Council reported that the different local associations had protested against the proposal of the Chancellor of the Exchequer to increase the stamp duty from 10s. to 20s. per cent., and had communicated their decisions to the Prime Minister and Chancellor of the Exchequer.

The question of inviting the National Federation to hold their summer meeting in 1911 within the Northern Counties area was discussed, and the secretary read the particulars of the entertainment given to the National Federation by various Federations.

On the proposition of Mr. W. S. Davison, seconded by Mr. R. J. Huntley, it was resolved: "That the question of extending an invitation to the National Federation to hold the summer meeting in 1911 within the Northern Counties area be left in the hands of the Executive Council."

The draft agreement between the National Federation of Master Plasterers and the National Association of Operative Plasterers was considered, and thought to be generally acceptable to this Federation.

The secretary explained the reason for the annual return of workmen, etc., and asked the members to send in at once the form sent to them by their secretaries, so that the result could be forwarded to the National Federation.

On the proposition of Mr. J. W. White, seconded by Mr. J. Proud, the president and the secretary (as substitute for Mr. Wilkinson) were appointed to attend the half-yearly meeting of the National Federation.

On the proposition of Mr. J. W. White, seconded by Mr. R. Johnson, it was resolved to hold the next quarterly meeting of the Federation at Stockton.—W. H. Hope, Secretary, Post Office Chambers, 14, Norfolk Street, Sunderland.

NORWICH AND DISTRICT ASSOCIATION.

Secretary: J. H. Hatch.

The annual outing of the Norwich and District Association took place on Wednesday, July 7th, at Wroxham, on the grounds of "Riversdale," kindly lent by Mr. Charles W. Daws. During the afternoon the members enjoyed a motor-boat trip round Wroxham Broad. The dinner was served in a marquee erected on the grounds, and the chair was taken by Mr. B. E. Searles.

NOTTINGHAM ASSOCIATION.

Secretary: W. J. Barton.

The quarterly meeting of the general committee of the Nottingahm Association was held last week, the president (Mr. W. W. Woodsend) in the chair.

The accounts for the past quarter, as examined y the Finance Committe, were submitted, and the payment of the same was duly authorised.

It was also resolved that a cheque be sent to the Midland Centre as this association's subscription for the current year.

The proposed new agreement between the Federation and the National Association of Master Plumbers and the National Association of Operative Plasterers was considered, and the same recommended for acceptance.

This association has for some time been in correspondence with the Nottingham Architectural Society, as to the payment to specialists for work done on contracts, and it was reported at this meeting that the Architectural Society had now passed a resolution deciding to adhere to clause 28 of the conditions of contract, and that such clause should be strictly observed.

This was considered by the Committee to be a most satisfactory conclusion to the negotiations on this subject.

SOUTH SHIELDS ASSOCIATION.

Secretary: J. G. Robertson.

The monthly meeting of the South Shields branch was held in the Victoria Hall, South Shields, on July 6th. The President (Councillor J. T. Armstrong) presided over a representative gathering, which included Mr. W. H. Hope, secretary of the Northern Counties' Federation, and Mr. W. C. Creasor, of the Teesside district.

It was agreed, after consideration, to accept the amended instructions of the Sunderland and South Shields Water Co., dealing with regulations as to pipes, etc., according to the purport of their letter.

The question of glass merchants giving the same terms to outsiders as to builders was again gone into.—Eventually it was resolved to let it lie over pending an official reply from the glass merchants, which had been promised.

The following letter from the Member of Parliament for the borough, Sir W. S. Robson, K.C., M.P. (Attorney General), was next read re increased stamp duty:—"Dear Mr. Robertson,—I find I have not replied to the resolution from the building trade in reference to the proposed transfer duty. I quite agree that this is a tax that would press inconveniently in several quarters, and I would be glad to see it dispensed with, but I am afraid there is no chance of that. This business of paying the bill for things that everybody wanted is no light matter.—Yours very truly, (signed) W. S. Robson."

The Northern Counties' Federation secretary, Mr. W. H. Hope, next addressed the meeting, giving them various reasons why he thought the branch should place their workmen's compensation with the Federated Employers' Insurance Association, specially dwelling on their cover-all policy. Mr. Creasor, the district representative of the Federated Employers' Insurance Association, supplemented the remarks of Mr. Hope, dwelling particularly on the satisfactory way in which his company had met all claims, and on the special arrangements made for this district to make it practically impossible for trouble to arise on that score, seeing that it had first of all to go before a joint board of three directors of the Federated Insurance Association and three (appointed) members of the Northern Counties' Federation, who failing to agree, had power to call in an umpire. On the proposition of the chairman, a vote of thanks was accorded to Messrs. Hope and Creasor for their attendance, and for the information given. Several questions were asked bearing on the subject. It was, however, resolved to let the matter lie over till the next meeting of the branch.

Councillor J. T. Armstrong was unanimously elected to represent the branch at the half-yearly general meeting at Portsmouth of the National Federation of Building Trades Employers.

Arrangements were made for the entertainment of the representatives of the Northern Counties' Federation on their visit to South Shields for their quarterly meeting to be held at the County Hotel.

The question of having a trip this year was most heartily taken up, and it was agreed to have same to Keswick on Wednesday, August 18th. Messrs. T. Anderson, A. Ross, and J. G. Robertson were appointed a committee to carry out the arrangements.

STOURBRIDGE AND DISTRICT ASSOCIATION.

Secretary—Percival D. Folkes, Chartered Accountant.

On July 13th the members of the Stourbridge and District Master Builders' Association held their annual outing to Holt Fleet, via Worcester. Among the party were Mr. C. Griffiths (president), Mr. T. J. Mason (vice-president), Mr. J. H. Willetts (hon. treasurer), Mr. J. Stokes (president, Worcester M.B.A.), Mr. P. D. Folkes (secretary) and besides members of the Association a number of manufacturers and merchants connected with the trade. After a sail up the river to Holt Fleet, luncheon was served at the Holt Fleet Hotel, where, after the toast of "The King," Mr. Stokes proposed the toast of the "Association," to which Mr. Griffiths responded. Mr. T. J. Mason gave "The Visitors," which was responded to by Mr. T. Freer Ash (Birmingham). On the return journey a short stay was made at Worcester, when the outing was voted one of the most enjoyable the Association has had.

WAKEFIELD AND DISTRICT ASSOCIATION.

Secretary: J. Beaumont.

At a meeting of the Wakefield and District Association, held at the Bull Hotel, Wakefield, on July 8th, Mr. Tom Lee (president), in the chair, the Secretary read the minutes of the meeting of the Yorkshire Executive Council, held at Barnoldswick on June 17th, and Mr. H. Fallas, who had attended this meeting, gave a supplementary report thereon, and specially referred to the excellent report submitted by Mr. A. W. Sinclair (Scarborough) on his recent visit to Germany under the auspices of the Housing Reform Council. On the proposition of Mr. Fallas, seconded by Mr. Elvey, it was decided to recommend the Yorkshire Executive Council to have Mr. Sinclair's report printed in pamphlet form and circulated amongst the members of local associations.

The form of sub-contract which had been prepared and settled by counsel, and submitted to the Association by the Yorkshire Executive Council for consideration, was gone through, and various points in several clauses in the contract, especially those relating to the liability for and insurance against accidents to the workmen of subcontractors, were fully discussed. On the motion of Mr. Elvey, seconded by Mr. Pashley, a special committee, consisting of the president, Alderman Judge, Councillor Spink, Mr. Fallas, Mr. Crook, with the secretary, was appointed to formulate and lay before the Federation Council the views and observations of the Association on the contract, some of the clauses therein not being acceptable to the members.

On the motion of Mr. Elvey, seconded by Mr. Gillott, it was decided to hold the next meeting of the Association on the first Thursday in October.

ARCHITECTURAL & TOPOGRAPHICAL SOCIETY.

The Architectural and Topographical Society have issued an appeal for help in their work, which has been described as one of national interest, namely, that of making complete historical records of the ancient buildings of these islands, from the introduction of civilization to the year 1800. Stress is laid on the following points:—(1) Since the foundation of the society, rather more than twelve months ago, complete accounts of the buildings in seventeen parishes have been published. (2) The value of the work has been endorsed by the fact that many of the leading societies interested in this subject are now subscribing. (3) There are at present some twenty parishes partly completed, in addition to those already dealt with, and several more are definitely promised. The fact that the society can obtain work of this nature entirely gratuitously shows how greatly the need for such records is felt by those who have expert knowledge of the subject. (4) The recent appointment of Royal Commissions to make an inventory of the ancient monuments of England, Scotland, and Wales, shows that the State appreciates the need for such work; and by its terms of reference, the Commission is only intended to make an inventory, and does not in any way cover the ground of this society's labours. (5) The other part of the society's work, which includes the collection of carefully made record drawings, notes, and photographs, etc., is progressing, and a considerable number of such records are now either promised, or are already in our possession. (6) All the work done for the society is purely honorary—therefore its funds are expended entirely on the work, and not in any way upon the workers. (7) A large sum of money is subscribed annually towards the furtherance of similar work in the ancient world of Egypt and Rome, and it would be unworthy of our national traditions should researches into the history of our own country fail for want of funds.

The minimum sum of £500 is required to ensure the effective continuation of the work of the society until such time as the annual subscription list shall be equal to the necessary disbursements; a further contribution would enable the rate of progress to be made more consonant with the amount of the work to be done. Subscriptions and donations should be made payable to the society, and crossed "London and County Bank." All communications should be addressed to the offices of the society at 33, Old Queen Street, Westminster, S.W. Donations will be treated as subscriptions, and donors of half a guinea or more will receive the "Record" for the current year, whilst those of seven guineas and upwards will be entered on the society's list of life members. The appeal is signed by Lord Plymouth, Lord Avebury, Sir Aston Webb, C.B., R.A., and Messrs. Francis Bond, J. A. Gotch, Emslie J. Horniman, M.P., Thos. G. Jackson, R.A., Mervyn Macartney, and Edward S. Prior.

Coming Events

Wednesday, July 14th—Saturday, August 7th.

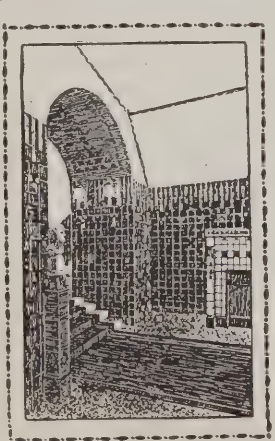
Town Planning and Housing Exhibition, Hampstead Garden Suburb, London, N.W.

Saturday, July 24th.

Architectural Association, 18, Tufton Street, Westminster.—Visit to Ardenrun, near Lingfield (Mr. Ernest Newton, F.R.I.B.A., architect). Train from Victoria 2.23 p.m.

Monday, July 26th.

Builders' Benevolent Institution.—Annual General Meeting, 4.30 p.m.; Committee Meeting thereafter; 31 and 32, Bedford Street, Strand.



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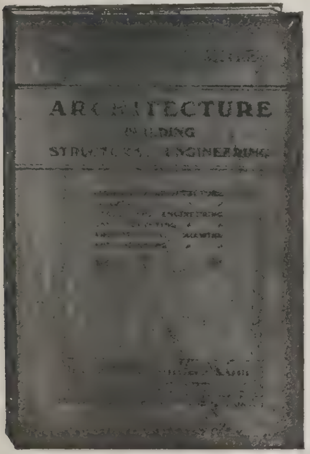

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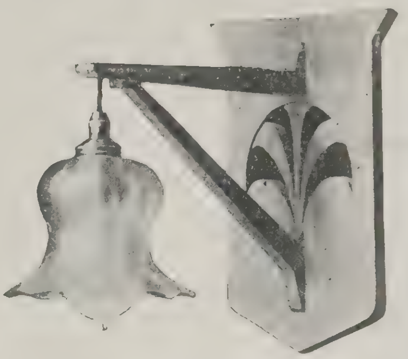

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Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Cardiff.—For the erection of a new warehouse, Severn Road, for Messrs. Wensley. Mr. Ivor Jones, A.R.I.B.A., architect, 18, St. Mary Street, Cardiff. Quantities by the architect.

W. E. James, Canton	£712
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W. P. Symonds and Son	598
D. W. Davies and Howell	596
F. Waterman*	594

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London. — Accepted tenders for cleaning and painting work to schools, for the London County Council Education Committee.

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H. Willmott, Triangle, Hackney	645	0	0
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H. C. Horswill	583	0	0
Honeywell Road, Clapham:			
W. Johnson and Co., Ltd., Wandsworth Common	420	0	0
Napier Street, Hoxton:			
Stapleton and Sons, 112, High Street, Stoke Newington ...	431	16	0
Duncombe Road, Islington:			
J. Stewart, 174, West Green Road, Tottenham	565	5	0
Burghley Road, and County Secondary School, Kentish Town:			
Stevens and Sons, Yonge Park	568	0	0
Dempsey Street, Stepney:			
Newell and Lusty, 24 and 26, Wilson Street, Poplar	471	0	0
Trafalgar Square, Stepney:			
F. and E. Davey, Ltd.	496	0	0
Neckinger Road, Bermondsey:			
J. Scott Fenn, 42, William Street, Woolwich	359	0	0
Page's Walk, Bermondsey:			
S. Musgrove, Amersham Vale, New Cross	256	19	0
Rochelle Street, Bethnal Green:			
G. Butters, Shore Road, South Hackney	88	0	0
Sydenham Hill Road, Lewisham:			
J. Scott Fenn	473	18	0
Woodland Road, Norwood:			
W. Young	223	0	0
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H. W. Crook and Son, 195, Westbourne Grove	53	12	0
Woods Road, Peckham			
G. Parker and Sons	477	0	0
Great College Street, St. Pancras:			
Stevens and Sons, Yonge Park...	328	0	0
Fortress Road, St. Pancras:			
Stevens and Sons, Yonge Park...	109	10	0
Stanhope Street, St. Pancras:			
C. P. Roberts and Co.	442	0	0
Myrdle Street, Stepney:			
R. Woollaston and Co.	454	18	0
The "Michael Faraday," Walworth:			
J. R. Sims, Horseferry Road ...	279	0	0
The "Southfield," Wandsworth:			
R. S. Ronald	465	0	0
Swaffield Road, Wandsworth:			
W. Johnson and Co., Ltd. ...	394	0	0
Hackford Road, Brixton:			
J. Garrett and Son	380	0	0
County Secondary School, Stockwell:			
J. Garrett and Son	178	0	0
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W. M. Glendinning	425	0	0
Leipsic Road, Camberwell:			
J. Garrett and Son	361	0	0
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W. M. Glendinning	375	0	0
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H. Line, 81, Peckham Rye ...	375	0	0
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Holliday and Greenwood, Ltd....	353	0	0
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E. Mills, Siebert Works, Westcombe Park	295	0	0
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H. and E. Lea, Warwick Street, Regent Street	370	0	0
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Plassy Road, Lewisham:			
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Elizabeth Street, Woolwich:			
J. Scott Fenn	219	0	0
Purrett Road, Woolwich:			
E. Proctor and Sons	260	0	0
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E. J. Orpin	126	10	0

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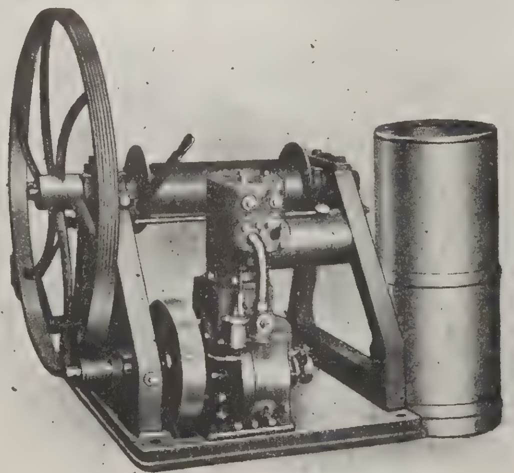

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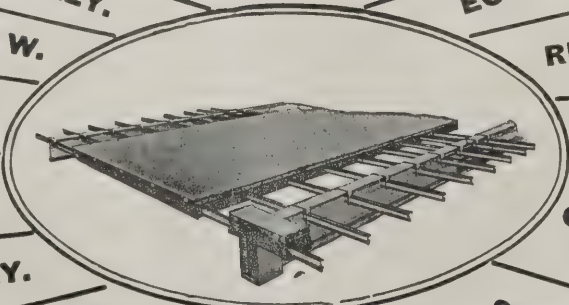

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(Tenders continued from page vi.)

Hengoed. — Accepted for the erection of 29 houses, for Mr. Leir Davies. Mr. H. Gabe Jones, architect, Hengoed, Cardiff.

Robert Forsyth, King's Hill, Hengoed, £4,321.

London, N.—For new secondary school for boys, Latymer Foundations, Edmonton. Mr. H. G. Crothall, architect :—

W. Johnson and Co., Ltd.	£8,033
Brand, Pettitt and Co.	7,700
L. and W. H. Patman	7,690
Rowley Bros.	7,571
Mattock Bros.	7,490
A. Fairhead and Son	7,344
W. J. Renshaw	7,333
A. Porter	7,275
J. Stewart	7,232
Treasure and Son, Ltd.	7,079
Knight and Son	6,945
W. Lawrence and Son*	6,782

*Recommended for acceptance.

*Accepted.

London, W.—For alterations to the police station at Notting Dale. Mr. J. Dixon Butler, F.R.I.B.A., architect, surveyor to the Metropolitan Police, New Scotland Yard, S.W. Quantities by Messrs. Thurgood, Son and Chidgey, 8, Adelphi Terrace, Strand :—

F. and H. F. Higgs	£2,290
Mowlem and Co., Ltd.	2,240
Treasure and Son	2,233
F. G. Minter	2,232
Holloway Bros.	2,220
C. Ansell	2,200
Higgs and Hill, Ltd.	2,184
McCormick and Sons	2,090
Willmott and Sons	2,074
Lovatt, Ltd.	2,057
Grover and Son	1,994
Ashby and Horner	1,988
Godson and Sons	1,947

London.—For the erection of a new ward block in Upper Road, Plaistow, E., for the Trustees of the St. Mary's Hospital for Women and Children. Mr. A. S. Snell, F.R.I.B.A., architect, 22, Southampton Buildings, Chancery Lane, W.C. :—

Sheffield Bros.	£17,451	0	0
Turtle and Appleton	16,335	0	0
Harris and Wardrop	15,992	0	0
Thomas and Edge	15,946	0	0
A. E. Symes	15,928	0	0
Mattocks and Parsons	15,847	0	0
Brown Bros.	15,812	12	10
Higgs and Hill	15,794	0	0
J. W. Jerram	15,700	0	0
Kirk and Randall	15,320	0	0
J. T. Luton	15,287	0	0
W. J. Maddison	14,919	0	0
T. W. Moss	14,872	5	0
H. Kent	14,622	0	0
B. E. Nightingale	14,798	0	0
W. J. Fryer	14,471	0	0
F. G. Minter	14,433	0	0
J. Allen and Sons	14,420	0	0
Spencer, Santo and Co.	14,390	0	0
F. and E. Davey, Ltd.*	14,337	1	11

*Accepted

Luton.—For erection of a new public library at the junction of George Street and Williamson Street, Luton. Mr. S. F. L. Fox, A.M.I.C.E., borough engineer and surveyor :—

W. Beardsmore, Northampton	£10,638	0	0
J. Honour and Son, Tring	10,590	17	0
Kirk and Randall, Woolwich	10,192	0	0
Coulson and Lofts, Cambridge	9,858	0	0
C. H. White	9,816	0	0
W. J. Bloxham, Banbury, Oxon.	9,810	0	0
O. P. Drever, Kettering	9,779	3	0
W. G. Dunham	9,772	0	0
W. and D. Wilkins, Watford	9,790	0	0
H. Flint, High Wycombe	9,697	0	0
F. M. Thompson and Sons, Nottingham	9,690	0	0
F. G. Minter, Putney, S.W.	9,548	0	0
G. W. Heath, Cambridge	9,466	17	0
T. Hickman, Market Harboro	9,369	0	0
C. H. Hunt and Son, High Wycombe	9,362	0	0
Hacksley Bros., Wellingborough	9,324	0	0
Spencer, Santo and Co., Kensington, W.	9,189	0	0
A. Lewin and Son, Kettering	9,100	0	0
Bentley and Co., Leicester	8,909	11	0
E. Brown and son, Wellingborough	8,880	0	0
T. and E. Neville*	8,873	0	0
J. Saunders and Son	8,776	0	0
Barber and George	8,374	18	5

Rest of Luton.

*Accepted.

Minster-on-Sea.—Accepted for the erection of two detached cottages. Mr. J. Wornell, architect, Slough, Bucks.

Hancock and Kettle, Minster-on-Sea, [illegible]

Oldbury (Staffs).—For erection of school at Titford Road, Langley, for the Education Committee. Mr. J. Gill, Smethwick, architect :—

W. Sapcote and Sons, Birmingham	£14,073
J. Bowen and Sons, Birmingham	13,697
W. J. Webb, Birmingham	13,640
J. Barnsley and Sons, Old Hill	13,546
W. Willetts and Sons, Old Hill	13,505
J. Webb, Handsworth	13,470
J. Johnson, Birmingham	13,374
H. Gough and Son, Wolverhampton	13,300
T. Elvins, Handsworth	13,240
M. Round and Sons, Dudley	12,995
G. Webb and Sons, Handsworth	12,969
J. Dallow and Sons, Blackheath	12,774
W. Jackson, Langley Green	12,763
B. Whitehouse and Sons, Birmingham	12,749
H. Dorse, Cradley Heath	12,503
G. H. Marshall,* Smethwick	12,237

Architect's estimate £12,700.

*Accepted.

Purley. — For erection of St. Mark's Church, Woodcote. Mr. Geo. H. Fellowes Prynne, F.R.I.B.A., 6, Queen Anne's Gate, Westminster, S.W., architect. Quantities by Mr. R. Henry Hale, F.S.I., 6, Queen Anne's Gate, Westminster, S.W. :—

C. Ansell and Co.	£10,034	0	0
J. Thompson and Co.	9,253	0	0
W. J. Dickens	9,080	0	0
Benfield and Loxley	8,926	0	0
D. Stewart and Sons	8,918	0	0
E. J. Saunders	8,527	0	0
A. Monk	8,514	13	7
Bowman and Sons	8,522	9	3
J. and C. Bowyer	8,490	0	0
Crossley and Sons	8,357	0	0
Goddard and Sons	8,200	0	0
J. Jarvis and Sons	8,248	0	0
G. H. Denne and Co.	8,210	0	0
Wallis and Sons	8,132	0	0
R. A. Lowe and Co.	8,008	0	0
Dove Bros.	8,083	11	0
J. Longley and Co.	8,045	0	0
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The Ironmongers' Almshouses.

The ceaseless conflict between utilitarianism and sentiment had for its arena recently the council chamber of the L.C.C. The Local Government Committee presented a report in which it was stated that the Ironmongers' Company were seeking permission to sell the site of the almshouses in the Kingsland Road, Shoreditch, to the Peabody Trustees, and to erect almshouses elsewhere. The almshouses, comprising fourteen dwellings and a chapel, were erected on a site of about an acre and three-quarters, in 1716, and have many of the characteristics of good eighteenth-century architecture, and it is contended that London is not so rich in specimens of this period that it can afford to destroy these with a light heart and a heavy hand; whereas, on the other hand, it has, from the aesthetic point of view, quite enough dwellings of the Peabody type. At the public enquiry that has been held, the opposition by the Shoreditch Borough Council, and by societies interested in the preservation of old buildings, seems to have weighed with the Charity Commissioners, who declined to sanction the sale. Thereupon the Ironmongers' Company appealed to the High Court. In the discussion by the L.C.C., Mr. Stuart Sankey declared that these buildings were of no archæological value whatever. Moreover, he said, they were very damp and noisome, and the walls were bulging and old. In their place the Peabody Trustees proposed to erect accommodation for about 1,200 people. The Ironmongers' Company, he added, was one of the richest and most important bodies in London, and had spent a large sum of money in charity. His friends the Ironmongers will probably think that Mr. Sankey doth protest too much. They might even suspect him of irony. If he had seen fit to "combine his information," he might have deduced the very simple proposition that, since dampness, noisomeness, and the bulging of walls, are not beyond the resources of modern skill to remedy, and are not conditions which even the most ardent archæologist would desire to perpetuate; and that since the Worshipful Ironmongers are so plethoric of a nobler metal than that which gives them their honourable name, they could quite conveniently spare a little of it to set their almshouses in order. A utilitarian argument of a different order was advanced by Mr. Barlow, who had less regard for the architectural value of the buildings than for the loss of the open space. Mr. Sturge (Sir John Benn with him) found that the almshouses were "most beautiful specimens of the early Georgian period of architecture, while the gardens were the only open space of any importance in Shoreditch." He added that "the City was removing, one by one, all the ancient landmarks, and that if the German Emperor, or anyone else, should attempt to loot the City, he would find that it had already been rifled by the Goths and Vandals." The picaresque image thus conjured up of the German Emperor, in full panoply of war, weeping over the ruins of the Ironmongers' Shoreditch almshouses, was too much for the councillors. They burst into hysterical laughter, and were apparently so much overcome by their emotions that they forgot to pass any resolution on the subject.

Sanitary Building.

At the concluding sitting of the Tuberculosis Conference at Stockholm, an Englishman—Dr. Hope, Medical Officer of Health for the City and Port of Liverpool—emphasised the wisdom of beginning with the germs. He claimed that the city of Liverpool is a striking example of the success of this thorough policy. Some fifty years ago, Liverpool, in common with most other crowded centres, was a hot-bed of disease. Step by step, as sanitary reforms were introduced, tuberculosis declined. The sanitation of the home, the school, the place of business, the widening of streets, the provision of open spaces, the erection of baths and washhouses, purified and improved water supply, had each and all tended to this result; and if the municipality had neglected such works, and had instead devoted the money spent on them to hospitals and sanatoria, leaving the tuberculosis breeding places untouched, they would have been guilty—although Dr. Hope did not say so—of crass folly, if not criminal neglect of the teachings of modern science. To the enlightened teachings of men of Dr. Hope's profession—Simon, Chadwick, Playfair, and Parkes, Corfield, and the rest, who insisted that disease is preventable and ought to be prevented—these vital reforms may be chiefly attributed; but credit must not be withheld from the authorities who hearkened to their counsels, nor from the architects and sanitarians who have so ably and so enthusiastically translated it into practice. Very much, however, remains to be done, and the architect and builder will be only too glad to assist in doing it. In this splendid campaign against disease, Britain took the lead, and that she still holds it is but dubious matter for self-gratulation. We are proud to have been the pioneers; yet, for the sake of suffering humanity, we should be delighted to find all the other nations well abreast of us in sanitation; but for the self-same reasons, they shall never get ahead of us!

The Federation at Portsmouth.

The visit of the National Federation of Building Trades' employers to Portsmouth, there to hold their half-yearly meetings, was a well-deserved compliment to the local association, which is one of the best organised and most flourishing associations in the kingdom, and this stands out only too prominently from the dead level of lethargy that generally characterises the South of England. It may be said that the compliment was returned with interest—historical and otherwise; for Portsmouth pulsates with the naval power and prowess that have made our country what it is, and may therefore surely claim to be in that respect the most intensely English town in England. "Oh! Portsmouth is a fine town, with ships in the bay!" runs one of many variants on the sailors' old "chanty," and if the "fineness" of the town as a whole is not strictly referable to its buildings, there can be no question that the Town Hall, where the Federation, by courtesy of the Mayor and Corporation, held its meetings, is one of the finest in the Kingdom. It is so dominating and dignified a feature—its tall tower can be well seen, all across the Solent, from the Isle of Wight—as to excuse, if not to justify, the remark of a Federationist that "There is more hall than town." That was probably this builder's way of expressing the fact that the town hall is out of scale with most of the other buildings, most of which are apparently survivals of the worst period of English architecture. But the town has many admirable buildings besides the Town Hall, and as it has more than 200,000 inhabitants, and these seem to be all very decently housed, it follows that the visitor's crude epigram is, after its kind, without foundation in solid fact, as one soon discovers on noting the countless houses that separate the George Hotel (the last house in which Nelson slept) and the unpretentious home in which Dickens was born. And as for the "ships in the bay," those who "want eight" need not "wait," for more than that number can usually be seen in the Solent; but none of them is half so interesting as the grand old "Victory," which, riding serenely in the harbour amidst modern warships and liners, may have suggested to Federationists a very obvious parallel case, in which, for the larger works, old methods of construction are being abandoned, the engineer is superseding the builder, and woodwork is giving place to steel. But the Solent abounds also in smaller craft, which are still built in the old way and of the old material, and their presence seems to carry the parallel, or the parable, a step further. Steel frame building is not required, and is hardly possible, for the great majority of structures! A summer meeting is peculiarly apt to partake of a holiday character; but, nevertheless, the Federation managed to get through a great deal of important business; and it seems to us to be a happy idea to make the summer meeting a movable feast. In this way, business is combined with pleasure; and the happy holiday spirit must be exceedingly useful in its natural tendency to correct acerbity and to promote the harmony and good-fellowship that are not merely enjoyable things in themselves, but are excellent lubricants of business. We heard a Federationist remark that he thought Portsmouth must be "the breeziest, bluffest and sea-saltiest place on earth." Appropriately, the President seems to possess these very characteristics in full measure. At Portsmouth, at any rate, he was breezy and bluff, and showed a full measure of the saving salt of humour—an invaluable asset in a leader of men. Altogether, the Federation is to be warmly congratulated on the entire success of its Portsmouth Conference.

Architectural Copyright. The movement in favour of copyright in architectural design is gathering force everywhere. The Danish Literary and Artistic Association has, at its recent Congress at Copenhagen, reaffirmed the principle, and has demanded for Denmark the assimilation of the rights of architects to those already enjoyed by painters and sculptors, in accordance with the agreement at the diplomatic conference of Berlin, on November 13th, 1908. In most countries the justice of the architect's claim to the protection of his original creation is now not only admitted, but given legislative effect; and it is declared by a French contemporary that in France, where the law on the subject has been actively and definitely in force since 1902, enforcement of the architect's rights has been found to be entirely practicable. The intentions of our own Government with respect to this very important question, will no doubt soon be made public.

Stunned Stonework. Correspondence about the decay of the stonework of some of our most cherished buildings has evoked the opinion of a scientific expert that much of the mischief is probably due to the former ill-considered use of blasting powder in quarrying. It has now become recognised that heavy blasting had the effect of weakening the rock crystals or grains, and quarrymen are now careful not to put upon the market stone that has been stunned, and the wasteful blasting process is being superseded by the use of the wire saw, which cuts the stone from its native bed without injuring its texture. That the crumbling stonework of our venerable buildings may have had its constitution ruined before it was placed in position, and that this condition no longer obtains, is doubtless reassuring to modern builders; but it makes the state of the old work even more hopeless than before. Clearly, if stonework crumbles because its constitution has been shattered while the stone was reposing in its natural bed, superficial treatment must be futile. This is a stunning blow to the anti-restorationists. It is now "up to them" to point out the inestimable advantages of stunned stone, and the insidious wickedness of the wire saw, which, being modern, must therefore be execrable.

THE BARNSLEY SCHOOL COMPETITION.

Through an error on the part of our correspondent it was stated in our issue of last week that the design of Messrs. Clark and Moscrop, of Darlington, was placed third in this competition instead of second, and the drawings given of the second premiated design and attributed to another firm were in reality by them. The accompanying notes on the competition also carry on the same error which we very much regret, and are unable to account for. Our correspondent thinks it must have been due to an error in labelling the designs at the exhibition. Will readers kindly note.

OUR ROYAL ACADEMY BALLOT.

The first ballot of architects to select those of their professional brethren whom they consider worthy of election to the Royal Academy of Arts has now closed, and the cards will be examined this week by the scrutineers, Messrs. A. W. S. Cross, V.P.R.I.B.A., and E. A. Richards, F.R.I.B.A. The percentage of those voting was higher than expected. About 40 spoiled cards were received, the majority being returned cards, the addressees having removed. A few of the others exhibited choice specimens of the office boy's humour, while some conveyed the disapproval of the ballot by the writers or their decision not to vote. One gentleman waxed wroth with us on our attempt to dictate to the Royal Academy, as if that institution were one of the elemental forces of nature instead of an association of painters and sculptors, several of whom have expressed to us their difficulties in voting for architects owing to their ignorance of the standing and work of the candidates. For their guidance our ballot was instituted, and we have, so far, every reason to be gratified by its success. In all, over 100 architects have received votes; and the object of this first ballot is to determine the first twenty of them who will be eligible for the second ballot.

NATIONAL REGISTRATION OF PLUMBERS

Examinations for master plumbers and operative plumbers in technical knowledge and workmanship are held in London and the chief centres of the United Kingdom for the purpose of rendering plumbers who pass the examinations eligible for certificates and registration. Only plumbers holding such certificates and registered are entitled to describe themselves as "registered plumbers." Particulars of the examinations and lists of registered plumbers may be obtained from the General Council for the National Registration of Plumbers (acting with the Plumbers' Company), 54, Parliament Street, Westminster.

HAMPSTEAD TOWN PLANNING EXHIBITION.

A Town Planning and Housing Exhibition at the Hampstead Garden Suburb, London, N.W., was opened on July 14th, by the Right Hon. Alfred Lyttelton, K.C., M.P., and will close on August 7th. Plans, photographs, and models illustrating town planning and city development are on view; cottages and houses, furnished and unfurnished, are thrown open for inspection; specimens of school gardens, children's playgrounds, and vacant land cultivation are to be seen; and on Wednesdays and Saturdays there are lectures by authorities on town planning and city development.

At the opening lecture, by Prof. Beresford Pite, Mr. Ernest George, President of the Royal Institute of British Architects, who was in the chair, remarking on the presence of members of the German Garden City Association, said that we in England have a great deal to learn from what is being done in the Fatherland.

Prof. Pite gave an admirably impartial summary of the advantages and disadvantages of town planning, and of the difficulties of the problem. The ancient city had been the sport of chance; the modern city would be the concrete expression of intention. A wise and educated knowledge of architecture, and familiarity with local conditions and character, are essential to success in town planning; but there is great need to educate on more enlightened lines the race that is busy building without adequate guidance.

Mr. Raymond Unwin also pleaded for a greater breadth of outlook on the part of architects, each of whom must now turn his eyes from the self-complacent prominence of his own particular building, and have a greater regard for its subordination to an ordered plan and a harmonious assembly.

Mr. S. D. Adshead urged the importance of educating the architect in the principles of town planning.

Mr. Lyttelton presented an address of welcome to the representatives of the German Garden City Association, stating that the founders of the Hampstead Garden Suburb Trust owed the results of much of their effort in this country to the inspiration of German example. The estate would provide houses for 10,000 people, with an average of eight houses to the acre, one family only being domiciled as a rule in each house. The concluding words of the address were as follows—"Emulation among nations is inevitable, and many believe it to be a spring of success. Let us hope that our peoples may strive in fields such as those in which we welcome you to-day, and that by their effort home life in Germany as in this country may be enriched and adorned, and friendship, based on knowledge between classes and nations, may be fostered and advanced."

Mr. Lyttelton said that the tendency in this country was to gravitate towards the towns. The object of the movement in which they were interested was, as far as possible, to turn that tendency to the best account, and to counteract whatever was mischievous in it. Something like a quarter of a million sterling had been expended on the estate.

At the luncheon which followed, Mrs. Barnett, responding to the toast of "The Town-Planning and Housing Movement," proposed by Sir J. Dickson-Poynder, M.P., said that, while character made environment, it was equally true that environment made character, and she believed in fostering that old-fashioned virtue, house pride, which was founded on thrift, forethought, and the power of taking pains. Such a suburb as the one where they had met enabled a woman to have a house in which she could take a pride, and a man to have a garden in which his leisure would be well employed.

After Mrs. W. H. Lever had also spoken, Mr. Vivian and Mr. G. R. Benson proposed the health of the guests, for whom Herren Bernhard Kampffmeyer and Dr. Rehorst replied. The latter gentlemen expressed the hope that the interchange of ideas on social subjects of this character would promote a good understanding between the two countries.

Examination Results.

School of Architecture, University of Liverpool.

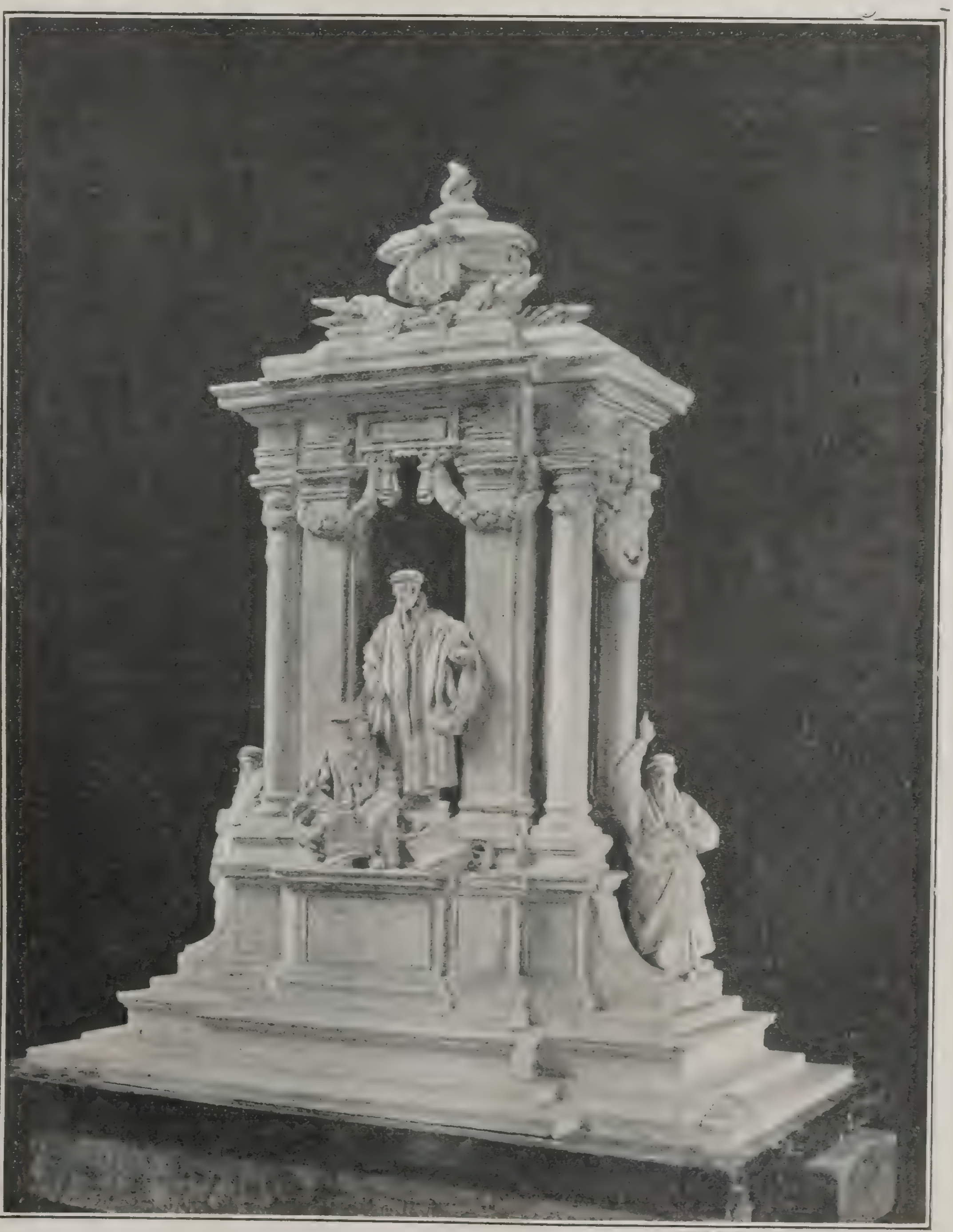
At the degree ceremony at the Liverpool University, on July 10th, in St. George's Hall, Lord Derby, the Chancellor of the University, announced the following awards: — Travelling Scholarships: Holt Travelling Scholarship (£50), L. B. Budden; Sydney Jones Travelling Scholarship (£25), H. A. Dod; University Scholarship in Architecture (£50), L. B. Budden. Degrees: B.A., with 1st class honours in architecture, L. B. Budden (thesis, accompanied by measured drawings, "The Greek Revival in England"); H. A. Dod (thesis, accompanied by measured drawings, "The work of Wren and Gibbs at Cambridge"). Pass Degree: S. H. Colton (thesis, with measured drawings, "The work of Cockerell and his Associates"). First class certificate: T. E. Forster. The above are exempted from their Intermediate Examination, R.I.B.A.

The Carpenters' Company.

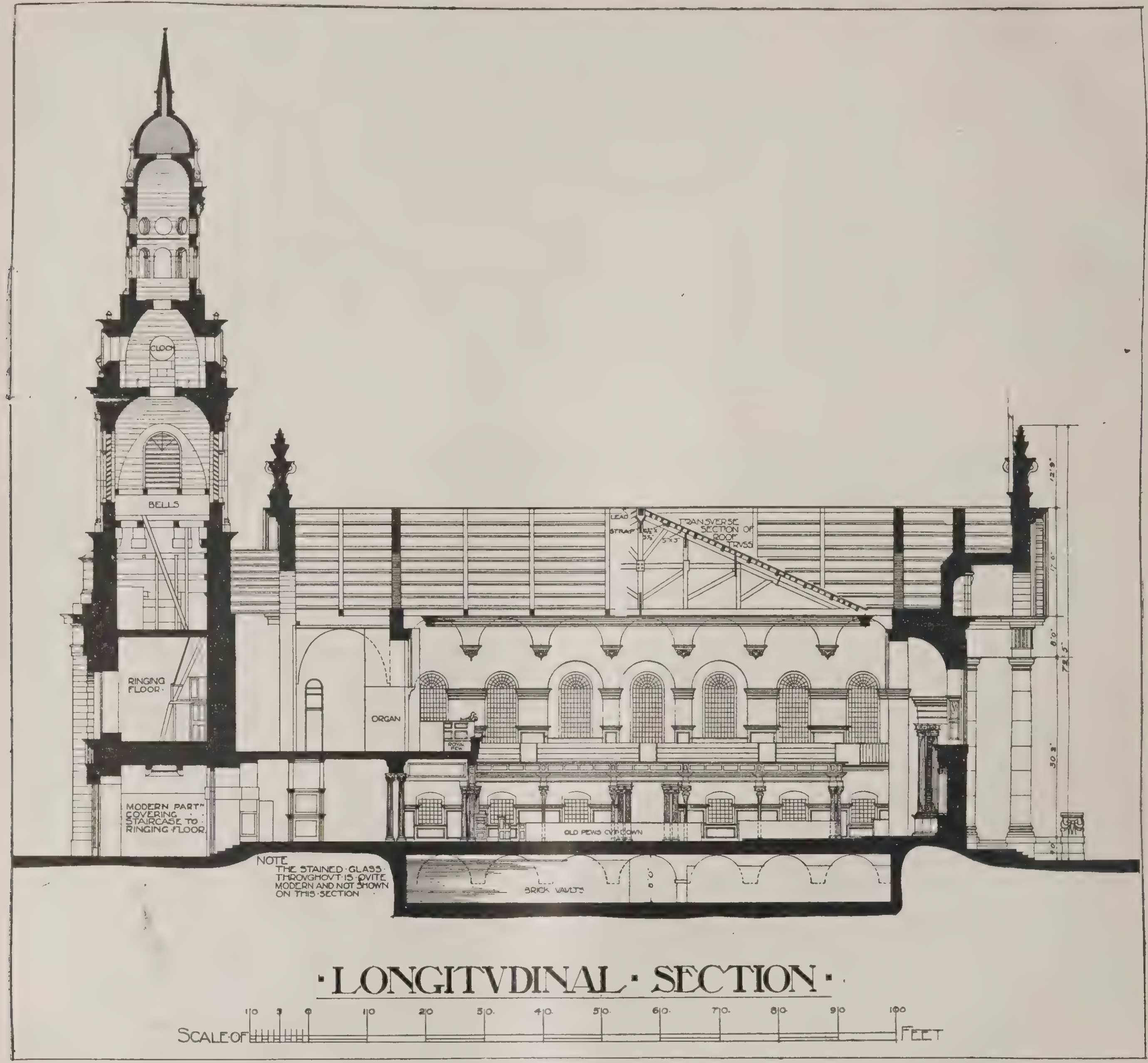
At the recent examinations in carpentry and joinery held in London and Manchester, the following candidates, in alphabetical order, passed successfully:—Bronze Medals: W. G. Fernie, James A. Haigh, P. Kilburn, Stanley Massey, B. Moore, Chas. H. Overend, E. Whitaker. First Class Certificates: M. C. Blamey, C. Burle, G. J. Chappell, F. Gardiner, F. Garner, R. Garnett, Arthur George, J. H. Higson, H. J. Kent, H. E. Kinns, A. Maclean, M. Henry Midghall, J. Roebuck, O. J. Sharp, A. H. Smith, R. Sykes, E. E. Syms, C. Williams. Second Class Certificates: A. C. Andrews, R. J. Back, G. B. Bardsley, J. W. Barthram, Henry Binks, A. E. Bonfield, J. B. Bonthrone, G. L. Brown, W. R. T. Cook, A. Cropper, D. I. Davies, J. H. Dixon, W. J. Dorey, J. M. Dovey, S. Hill, J. M. Jarvis, J. W. Jones, C. H. Kendall, H. Last, J. R. Saunders, B. T. Scott, Wm. Todd, G. Whiteside, A. J. Wiseman, C. E. Worsfold.

COKE BREEZE IN CONCRETE.

With reference to the paper on this subject read by Mr. D. B. Butler to the Society of Architects, and summarised in our issues of April 28th and July 9th, a correspondent of the "Times" makes a statement to which Mr. Butler replies as follows:—"Referring to my recent experiments he says:—'The expansion as measured on the small bars which Mr.



DESIGN SUBMITTED FOR THE REFORMATION MEMORIAL AT GENEVA. THE CENTRAL MONUMENT.
LANCHESTER AND RICKARDS, ARCHITECTS: HENRY POOLE, SCULPTOR.


BELLS
CLOCK
RINGING FLOOR·
MODERN PARTⁿ COVERING · STAIRCASE TO · RINGING FLOOR
ORGAN
ROYAL PEW
LEAD
STRAP
TRANSVERSE SECTION OF ROOF TRUSS
OLD PEWS CUT DOWN
NOTE THE STAINED·GLASS THROUGHOUT·IS·QUITE MODERN AND NOT SHOWN ON THIS·SECTION
BRICK VAULTS
12'9"
17'0"
8'0"
72'5"
30'2"
·LONGITUDINAL· SECTION·
SCALE·OF
10
5
0
10
20
30
40
50
60
70
80
90
100
FEET

CHURCH OF ST. ALFEGE, GREENWICH. MEASURED AND DRAWN BY FRANK A. COLLARD.

(*See also last week's issue.*)

Butler employed cannot be considered as satisfactory, for the bars were not large enough to ascertain correctly the actual amount of expansion.' "If," writes Mr. Butler, "the correspondent will kindly refer to the paper in question, which was published in full in more than one technical journal, he will find that the method of measurement adopted—i.e., prisms 100mm. long and 22 by 22 mm. in cross section, measured in the well-known Bauschinger micrometer calliper apparatus, enabled a variation in length of 1/200mm., or .005 per cent., to be detected with certainty. I do not know what greater accuracy the correspondent would require, but I venture to doubt if the larger bars he suggests would be measured with equal accuracy by ordinary methods of measurement.

"I am also somewhat at a loss to understand the correspondent's statement that my researches showed the chemical action of the breeze upon the reinforcing bars to be more serious than the expansion it caused. As a matter of fact, my experiments were, in this instance, exclusively limited to the expansion question, and only passing reference was made to the rusting effect of the breeze concrete upon the iron moulds in which the Bauschinger bars or test pieces were moulded.

"As I stated towards the end of my paper, although these experiments included the preparation of some 300 test pieces, involving some 5,000 measurements, they only touch the fringe of a wide field of research in which there is a vast amount of work yet to be done; but what they do show very clearly is that, apart from the important question of corrosion of the steel reinforcement, there is not much danger to be apprehended as regards subsequent expansion from the use of pure breeze—i.e., fine coke—but that the danger really lies in the use of ashes and furnace refuse of all kinds, which are improperly described and supplied as breeze. In passing through the London streets one has only to notice the absolute rubbish being delivered alongside buildings in the course of construction for breeze concrete purposes to appreciate the force of the foregoing remark."

His Majesty's Office of Works has placed the order for the whole of the large ornamental sashes and bronze casements in the new King Edward Building, G.P.O., E.C., with Messrs. George Wragge, Ltd., 209, Shaftesbury Avenue, W.C., and Manchester, who are now carrying out the work under the direction of the architect, Sir Henry Tanner.

Obituary.

Mr. J. A. Campbell, F.R.I.B.A.

We regret to announce the death of Mr. John Archibald Campbell, F.R.I.B.A., of St. Vincent Street, Glasgow, which occurred suddenly on the 19th inst., while on a visit to his sister at Edinburgh. Mr. Campbell was born in Glasgow in the year 1859, and was a son of the late Mr. Archibald Campbell, merchant, Glasgow, grandson of the late Mr. Wm. Campbell, of Tullichewan and a second cousin of the late Sir H. Campbell-Bannerman and the late Mr. Jas. A. Campbell, of Stracathro. He was educated at the Gordon College, Aberdeen, and Glasgow University. After serving his apprenticeship with the late Mr. John Burnet, architect, he studied in Paris from 1880 to 1883, and won the Tite prize in 1885. He was a partner in the firm of John Burnet, Son, and Campbell from 1896 to 1897, but started business on his own account in the year 1897, and recently assumed Mr. A. D. Hislop as a partner. Mr. Campbell was a prominent member of the Glasgow Institute of Architects, and a Fellow of the Royal Institute of Architects. He was also a member of the Trades House and a Burgess of the City of Glasgow; a member of the Western Club, and served on the committee; a member of the Corporation of Masons, an active member of the Glasgow Art Club, having held the position of hon. secretary. He was at one time interested in golf, and was a member at the time of his death of the Prestwick and Ranfurly Golf Clubs. Among the most important buildings erected from his designs were the West George Street Property Co.'s building at the corner of West George and Hope Streets; Dundas House, Buchanan Street; the Edinburgh Life Assurance Buildings, St. Vincent Street; the Queen Victoria School and Memorial Chapel, Dunblane; and the Northern Assurance Buildings, at present in course of erection in St. Vincent Street. Mr. Campbell, who was a bachelor, took no active interest in politics.

* * *

Mr. John Wornham Penfold, whose death is announced, was an old and highly respected member of the Surveyors' Institution, to which body he acted as hon. secretary for many years. As surveyor to the Goldsmiths' Company he took an active part in rebuilding the quarter of the City about Jewin Street—especially connected with the Manchester trade—after the great fire which occurred there some 20 years ago; and he represented the Crown in the negotiations incident to many of the large purchases which have been necessary in recent years for the extension of Government offices. In the expansion of Haslemere, Mr. Penfold's services as an architect were of great value to the neighbourhood. He was peculiarly happy in enlarging and adapting the cottage or small farmhouse for the purposes of summer or week-end residence; and it is largely due to his taste and ingenuity that Haslemere has been saved from the rawness and garishness too often characteristic of a growing place. Mr. Penfold will also be commemorated in Haslemere by a most useful cottage hospital, which some years ago he generously built and endowed from his private means.

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The death has occurred of Mr. John Gallimore, of Newcastle, who was the builder of Manchester Post Office, as well as post offices in other parts of the country.

* * *

Mr. John Haggas, of Devonshire Street, Keighley, and head of the firm of Messrs. John Haggas and Sons, architects, Keighley, died with tragic suddenness at Morecambe, at the age of sixty-eight years. Mr. Haggas, who had lately suffered from heart affection, travelled by the 5.19 train from Keighley to Morecambe on Friday afternoon. Shortly after arrival he was taken ill, death ensuing about one o'clock the following morning. The deceased gentleman had been in business for nearly forty years, and had designed many local buildings, including the Keighley Town Hall. He never took any active part in local public or political affairs, being of a very quiet and retiring disposition. He was a regular attender at the Devonshire Street Congregational Church. Mr. Haggas leaves four sons and two daughters.

* * *

Mr. Robert Cole, builder, who has died at Stamford Hill at the age of fifty-seven, had had much to do with building developments at Stamford Hill and Clapton.

Notes and News.

In reply to a question by Mr. Gibbs in the House of Commons on the 20th inst., Mr. Harcourt stated that the removal of the equestrian statue of King Charles I. when the new thoroughfare was opened up between Charing Cross and the Mall, was reserved for future consideration. He (Mr. Harcourt) was waiting for the London County Council proposals as to developments on the Trafalgar Square side of the building.

* * *

The Representatives of the Ministries of Marine, Finance, Public Works, and Fine Arts, who have been considering ways and means of preserving the insular character of Mont-Saint-Michel, have submitted their report to their respective departmnts. The committee recommends that no further concessions for the reclamation of land from the sea should be granted, and that round the mount should be drawn a zone extending to a distance of at least 1,500 metres towards the east, and in the west to a distance which would be fixed by agreement with the Compagnio des Polders. Steps are to be taken to stop the progress of the work of reclamation. With regard to the dyke which joins the mount to the mainlaid, two alternative proposals are made—either to preserve the dyke with the exception of a section some 200 metres long, starting from the mount which would be spanned by a bridge, or to bridge the whole channel with a bridge 1,500 metres long. It is believed that a judicious modification of the Roche Torin Dyke would promote a free flow of water which would help to clear the bed of the bay. These proposals are to be submitted to the Bridges and Roads Department for examination with a view to ascertaining their cost.

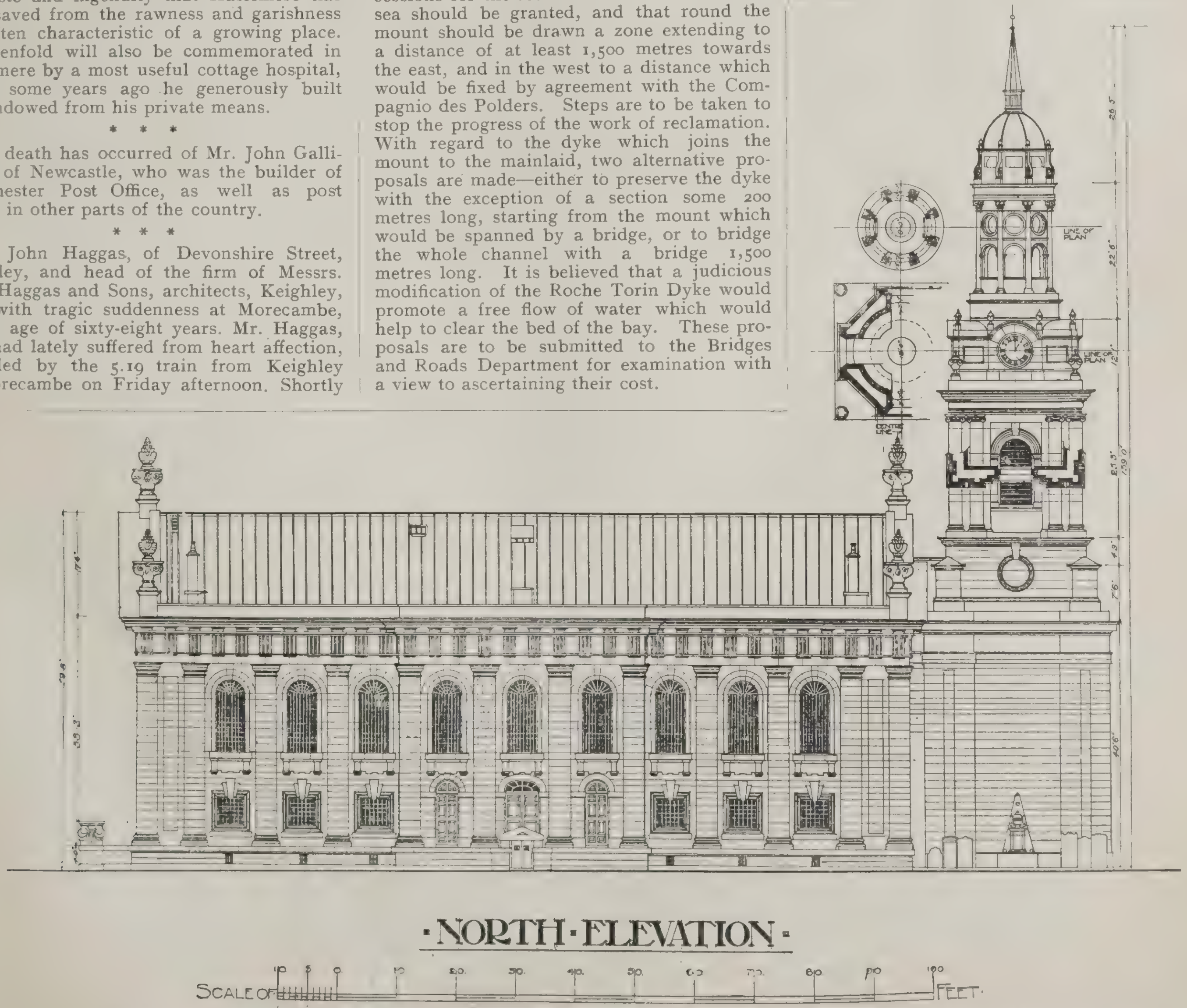
The strictness of the building laws in Paris has been exemplified in the case of a fine prospect which has been preserved from partial disfigurement in the Place de l'Etoile. Here a new hotel has been erected, and the surveyors have discovered that the building is about 32ins. higher than the law allows. An order has been issued to the landlord to have the building reduced to the legal height, but as he refused to obey it the municipality is about to carry out the work itself at a cost of £2,800. This sum will be recovered afterwards from the landlord.

* * *

To cope with their increasing London business, Messrs. Henry Johnson and Sons, plasterers, slaters, and tilers, of Liverpool, London, and Johannesburg, have taken more commodious premises at 69, Victoria Street, Westminster, S.W. Their telephone number is accordingly altered to 5,419, Westminster.

* * *

A society has been formed under the title of "The Technical Essay Society," for the purpose of developing and stimulating interest in the various branches of the building trade by the writing of essays. Subjects will be chosen from time to time, and competitions held, in which the society's medals will be awarded. Wherever possible, the winning essay will be published in a building trades journal. A committee is being formed to appoint judges, select subjects, and carry on the business of the society. Intending members should forward name and address to the hon. secretary, Mr. S. J. Adcock, Weeting, Brandon, Norfolk. The subscription is nominal, all services being honorary.



THE CHURCH OF ST. ALFEGE, GREENWICH. MEASURED AND DRAWN BY FRANK A. COLLARD. *(See also last week's issue.)*

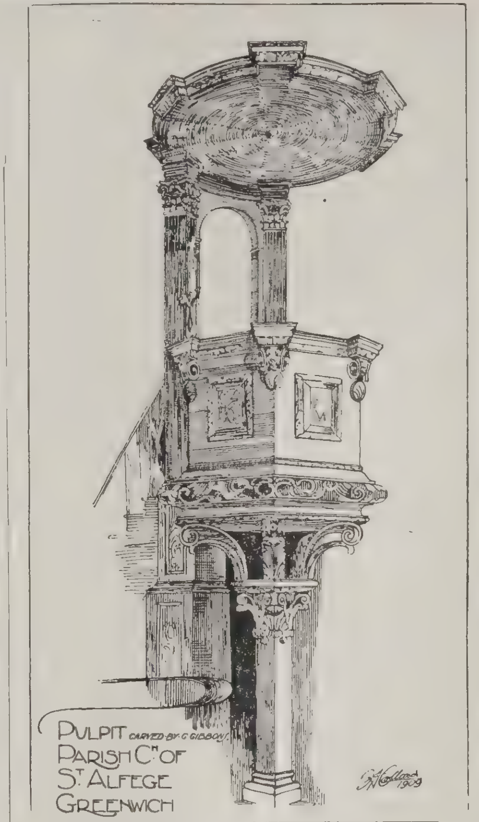
The Council of the Association of Teachers in Technical Institutions, acting on behalf of members of the association who are teachers of artistic trades, and crafts (such as bookbinding, cabinet-making, wood-carving, upholstering, goldsmiths, silversmiths, jewellers and metal workers) desire to draw attention to a series of resolutions embodying reforms which they consider urgently needed in the interests of English craftsmanship. These recommendations are the outcome of contributory papers, discussions and enquiries, extending over a long period among members of the London Arts and Crafts section, who besides being technical teachers, also include employers, foremen, journeymen, trade unionists, and day trade school teachers. In conducting these enquiries, the following main divisions have engaged attention. 1, The standard of work; 2, the relative amount of hand and machine work in each craft; 3, the conditions of apprenticeship and the existing means of training apprentices; 4, the work of existing evening trade classes; 5, the need or otherwise for day trade schools.

* * *

At the monthly meeting of the Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held at the Society's House, 7, Dean's Yard, Westminster Abbey, the Rev. Canon C. E. Norman in the chair, grants of money were made in aid of building new churches at Lower Mitton, St. Michael, near Stourport, £75; Merton, St. John the Divine, Surrey, £125, for the first portion; and Purlwell, St. Andrew, near Batley, Yorks, £125; towards rebuilding the church at Haslington, St. Matthew, near Crewe, £50; and towards enlarging or otherwise improving the accommodation in the churches at Boyne Hill, All Saints, near Maidenhead, £75; Cann, St. Rumbold, Dorset, £15; Fincham, St. Martin, Norfolk, £20; Hedworth, St. Nicholas, Durham, £35; Ipswich, St. Bartholomew, £20; Llanddewi, St. David, Denbigh, £10; Sefton, St. Helen, near Liverpool, £40; Skenfrith, St. Bridget, near Monmouth, £25; Trent Vale, St. John the Evangelist, Staffs, £50; Warmley, St. Barnabas, near Bristol, £20; and Whatcote, St. Peter, Warwickshire, £15. Grants were also made from the special mission buildings fund towards building mission churches at Caergeiliog, near Holyhead, £15; Nedging Tye, Suffolk, £5; Scackleton, near York, £20; and Washford, near Taunton, £30. The following grants were paid for works completed:—Hill, St. James, near Sutton Coldfield, £75; Shuttington, St. Matthew, near Tamworth, £25; Eastney, St. Margaret, Hants, £200, on account of a grant of £1,000; Sunnyside, St. Michael, near Berkhamsted, £120; West Kirby, St. Andrew, Cheshire, £155; Epsom, St. Barnabas, Surrey, £120; Southover, Wells, Somerset, £25; Charterhouse-on-Mendip, Somerset, £20; Ebbw Vale, Monmouth, £10; and Methwold, Norfolk, £15. In addition to this the sum of £206 was paid towards the repairs of eleven churches from trust funds held by the society. Nine thousand one hundred and sixty places, more than half the parishes in England and Wales, have been aided by the Society with grants from the general fund amounting to £1,062,765, and 973 grants have been made from the mission buildings fund amounting to £26,229.

* * *

The West Riding Finance Committee have for some time had under consideration the work of the architect's department, and have arrived at the conclusion that the work under the Education Acts is sufficient to absorb the entire time and attention of a competent architect. They therefore recommend that the West Riding architect's department be reorganised and divided into two sections, each to be under a competent architect, one to take charge of the work of the Education Committee, the other to take the rest of the work; that the salary of the West Riding architect be reduced from £1,500 to £1,000 per annum as from 1st January, 1910, provided he agrees that he will not make any claim for compensation by reason of such reduction; and that an architect be appointed to carry out the work of the Education Committee at a salary not exceeding £500 a year.



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The Building Act Committee of the London County Council, in accordance with the terms of the reference empowering them to meet as often as may be necessary when the Council is in recess, have decided to hold the summer recess meeting on Tuesday, August 31st. They have also decided that no matters involving important questions of policy or principle shall be dealt with at that meeting.

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The Bill for the Registration of Architects in the Transvaal, promoted by the Institute of Architects in the Transvaal, and supported by the Society of Architects of London, has passed both Houses of the Legislature.

Societies and Institutions.

Northern Architectural Association.

The members of the above association held their annual excursion on Wednesday, July 14th, when a visit was paid to Selby and neighbourhood. Among those present were Mr. G. T. Brown, president, Mr. H. C. Charlewood, Mr. C. S. Errington, Mr. J. Oswald, Mr. J. Bruce, Mr. W. Milburn, Mr. J. Hall, Mr. F. E. Dotchin, and Mr. J. B. Cubey. The party proceeded to Selby Abbey, where they were welcomed by the vicar, the Rev. M. Parkin, who conducted them over the building. Mr. Searle (clerk of works) explained in detail the progress made in the restoration necessitated by the lamentable fire of 1906. Driving to Hemingbrough, the party was met by the Rev. W. P. Wright, who very kindly gave a most interesting description of the church, which is one of the most interesting in Yorkshire. Much interest was manifested in both the abbey and church, and on returning to Selby dinner was served at the Londesborough Hotel.

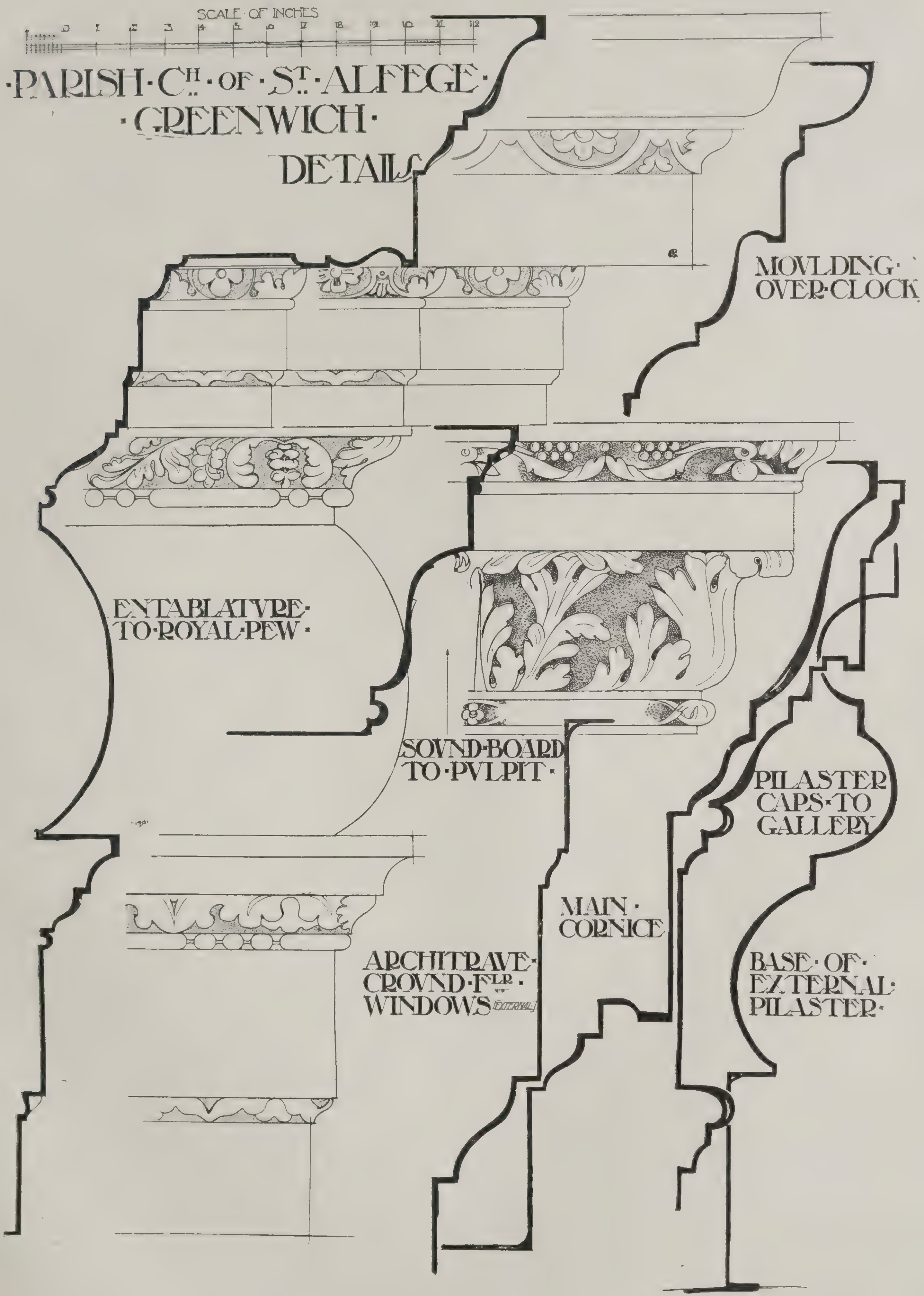
Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
July 30	GRIMSBY TOWN HALL EXTENSION. Estimated cost £26,000. Conditions of competition sent to any applicant on receipt of a stamped addressed foolscap envelope. Full particulars, schedule of requirements, plans of existing buildings, etc., on receipt of deposit £2 (cheques to be made payable to Frank Stephenson, Borough Treasurer), which deposit will be returned to those who send in designs, or if the whole of the particulars are sent back within ten days from the date of their receipt by the applicant. Premiums of £250, £150 and £100. An Architect of eminence will advise in conjunction with the Borough Engineer. Applications to be made to the latter, H. G. Whyatt, Assoc.M.Inst.C.E., Town Hall, Grimsby.
July 31	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
Aug. 30	FOREST HALL, Elementary school for 250 scholars. County of Northumberland Education Committee invite designs from architects practising in the County and in the City and County of Newcastle-on-Tyne. Particulars, conditions and plan of site from C. Williams, Secretary to the Education Committee, The Moot-hall, Newcastle-on-Tyne.
Aug. 31	HUDDERSFIELD NEW CHURCH. Plans are invited for a church to seat 400, to cost about £2,000, not to exceed £2,500, with all fittings, furnishings, lighting and heating apparatus. Plans to be forwarded to the Rev. D. Macræ Tod, B.D., St. James' Manse, Huddersfield, by Aug. 31.
Sept. 1	BRANCH LIBRARY, NEW CROSS, for Deptford Borough Council. Limited to Architects practising in the City or the County of London. Assessor: J. S. Gibson, Vice Pres. R.I.B.A. Premiums, £52 10s., £26 5s., and £10 10s., for three selected designs, and will be awarded in accordance with the conditions contained in the instructions to competitors. Site plan and copy of instruction from Vivian Orchard, Town Hall, New Cross Road, S.E. Deposit £1 1s., refunded on receipt of *bona fide* design or if instructions are returned within 21 days.
Sept. 20	HULL TRAINING COLLEGE for teachers in Elementary Schools. The Education Committee invites Architects to submit designs. Premiums of £150, £100, and £50 to authors of the designs placed 1st, 2nd and 3rd respectively. Particulars and plan of site may be obtained of J. T. Riley, Secretary of Education, Albion St., Hull. Deposit, One Guinea, returnable on receipt of *bona fide* design, or the return of particulars within 14 days.
Oct. 1.	ABERDARE HOSPITAL. The Aberdare Urban District Council invite competitive designs for a fever hospital for 52 patients, including administrative block, outbuildings, etc. Premiums of £100, £50, and £25 for the designs placed first, second, and third respectively. An Architectural Assessor will be appointed on the nomination of the President of the Royal Institute of British Architects: also a Medical Assessor to act jointly. Particulars and conditions of the competition, together with a plan of the site, may be obtained from Mr. T. Phillips, clerk, Town Hall, Aberdare, on deposit of £3 3s.

The first motor sub-station of the London Fire Brigade, giving accommodation for two motor fire-escapes, was opened on the 20th inst.



MEASURED AND DRAWN BY FRANK A. COLLARD.

(See also last week's issue).

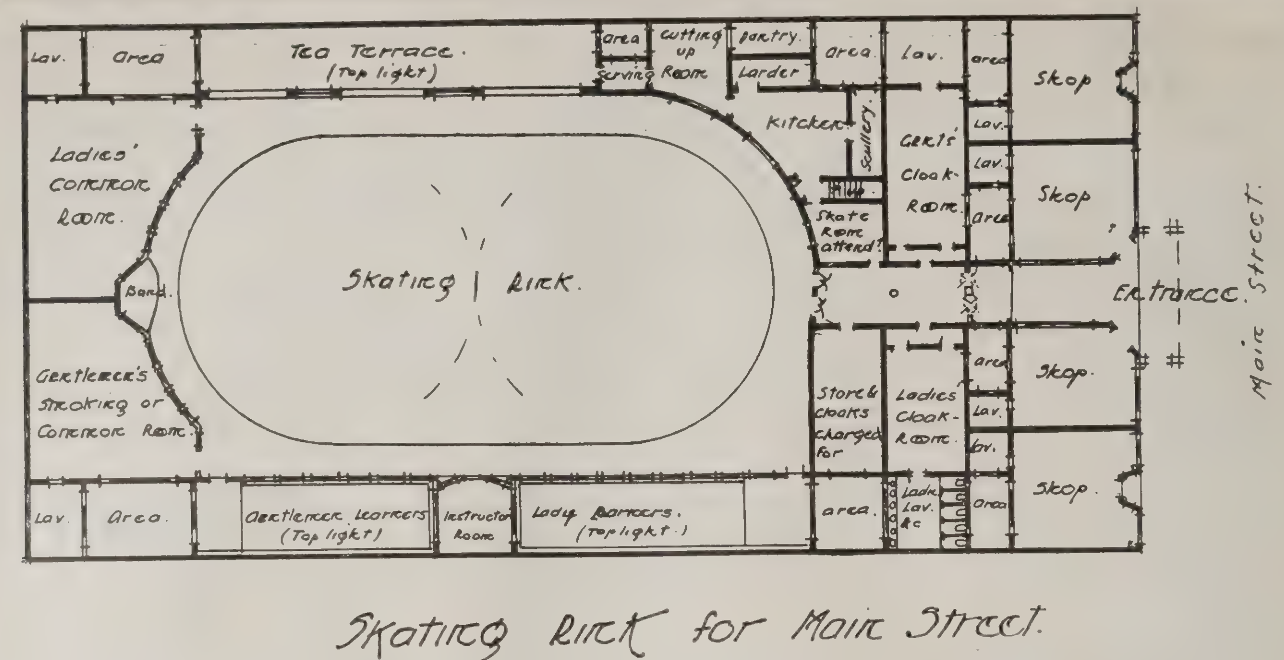


FIG. 1.—PLAN FOR A ROLLER SKATING RINK. E. C. MORGAN WILLMOTT, A.R.I.B.A.

THE DESIGN AND PLANNING OF ROLLER SKATING RINKS.

By E. C. Morgan Willmott, A.R.I.B.A.

The present popularity of roller skating has given rise to a demand for places possessing the accommodation and conveniences necessary to this revived recreation, and some notes relative to their design and planning have been deemed expedient.

Within the brief scope of this article we have three classes of roller skating rinks to consider: first, there are those rinks which can be adapted to the needful conditions by certain alterations and additions to existing premises; secondly, there is the new rink built more or less as a temporary building; and, thirdly, there is the rink which will be contained within a permanent building structure.

It is to be doubted whether the investor can be tempted to put money into a building of a permanent character, for he not unreasonably fears that the present boom may be only a passing craze. Hence the majority of rinks now being laid down are housed within buildings of a very temporary character.

Before, however, considering the fuller details of construction and materials, it will be as well to sum up the various points relating to site, planning, and accommodation, and it is to be remembered that these notes will fully apply to rinks adapted from existing premises. Preferably, of course, an open site is desirable, although, in our large provincial towns, this will be more or less impossible to obtain, as conditions render it imperative for financial success that the rink should be as conveniently and centrally situated as possible. Again, certain forms of top or clerestory lighting are desirable, so an enclosed site is not disadvantageous in this respect.

The accommodation will, of course, depend upon the class of person who will use the rink; but, obviously enough, the small or select rink will be designed with greater regard to privacy and more in the nature of club premises.

For the large public rinks, however, there will be the rink proper, entrance vestibules, skate rooms, offices, manager or secretary's room, cloakrooms for each sex, with lavatories adjoining, band stand, tea terraces or refreshment rooms, and perhaps also a gentlemen's smoke room and ladies' general or common room, pay office, instructor's room, kitchen, scullery, service room and larders. This would be approximately the full extent of the accommodation required, but there would also be certain rooms contingent to others already mentioned.

Fig. 1 represents an attempt which the author has made to realise the best form of premises for a roller skating rink, and a building which practically comprises this plan will at once be erected in South Wales. In it an endeavour has been made to realise the good points of many differing plans. This plan provides for a skating rink with a frontage in a main street, with shops at each side of the entrance. Over the shops will be showrooms and offices suitably arranged in suites.

A wide central entrance is provided, which gives direct access on to the rink proper, and it is in regard to the arrangement of this that the chief word must be written. It will be seen that the rink is so arranged as to comprise proportionally two circles touching each other tangentially, this being, in the author's opinion, the ideal proportion. Such a rink provides a sufficiency of curve to allow of the maximum of pleasure to be obtained from speedy skating, without in any way so confining the curve as to produce giddiness; at the same time, the absence of any great length of straight discourages racing and recklessness. There will be an open barricade of a substantial character, and about 3 ft. 6 in. to 4 ft. high, and on the other side will be a walking space and place for skaters to take a chair and put on their skates. It is important that this walking space should be at least 10 ft. wide. Sometimes, besides this, small galleries are also provided, as in the plan of the New American rink at Cardiff. These galleries can be used both for skaters and spectators. In respect to the latter, one cannot help thinking that sufficient provision should be made for them in every rink, as certain people are always glad to look on when they cannot actually participate in such a sport as roller skating. Were rinks planned in a manner calculated to attract the spectator an added source of profit might form an additional temptation to prospective shareholders. In the rink illustrated in Fig. 1 we see a ladies' common room and a gentlemen's smoke-room, also a spacious tea terrace, where spectators and skaters can obtain light refreshments. Kitchen, servery, cutting-up room, scullery, larders, etc., are conveniently provided for this purpose. Gentlemen's and ladies' rooms are also provided with lavatories lighted by suitably disposed areas. The best place for the band in such a plan as is considered in Fig. 1 is undoubtedly in the position shown, viz., contiguous to the common rooms, for if it is placed in any other position the noise created by the skating almost invariably drowns the music. In this case, however, it would at least be heard in the common rooms.

Varying authorities have considerably varying opinions as to the merits or demerits of different kinds of floors. Originally a fine Portland cement finish to a 6 in. concrete floor was considered to be excellent, but the danger occasioned by a heavy fall has mitigated against its successful adoption. Again, it is cold and comfortless, and does consider-

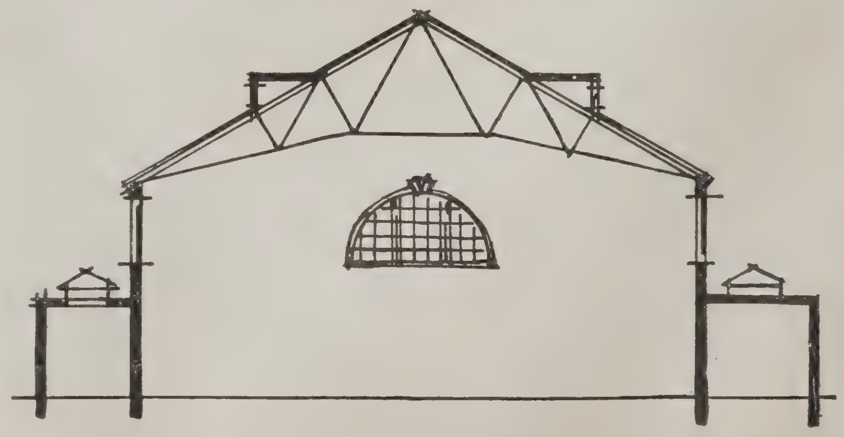


FIG. 2.—SECTION SHOWING A FORM OF ROOF CONSTRUCTION SUITABLE FOR ROLLER SKATING RINKS.

able damage to the skates. Cement or asphalte is never perfectly level, and the latter works greasy, and is therefore slippery in damp weather. It is also heavy to skate upon during the warm weather, as it becomes less hard. Marble slabs properly laid and grouted in cement have been used with a great degree of success; but as this material is expensive, it could only be used in private rinks of a small size. A rink with the floor prepared in this manner would have the same disadvantage as concrete for those skaters not sufficiently skilful to avoid falling.

The general consensus of expert opinion prefers a maple floor laid in narrow widths. Mr. T. Maxwell Witham gives an interesting description of the manner in which he thinks a floor of this kind should be laid with red pine strips 1 in. to 1¾ in. wide. A log would be sawn into these strips, each strip to be cut so as to ensure that the edge of the grain shall be uppermost; in other words, that no strip has the grain of the wood parallel or flat to the surface. The floor is made by being put together in sections, and each section consists of eight or ten strips, say, 10 ft. long, and at the back of each section battens are laid across diagonally, about 4 ins. apart, and these are screwed or nailed with round nails to the strips. The battens being laid diagonally across the strips, the sections will open and shut like a parallel ruler. The ends of the battens project so as to enable the sections to interlock, and the butt ends of each section, being properly squared, are grooved, and when one butt end is placed flush up against another an iron tongue is driven into the groove, and the butt ends are thus prevented from springing. The floor is laid on an ordinary floor, and the sections are laid down beginning from the outsides of the rink and meeting in the centre. These two middle sections are not interlocked, but a strip of pine wood is placed at the ends of the projecting battens and screwed down to the floor underneath, the screws in this batten being the only ones necessary in the whole floor. If in very hot weather the floor opens at all, a wedge driven in between the wall and the floor tightens it all up. The wear to be got out of a floor made and put down in this way is astonishing. The floor of the Crystal Palace skating rink was put down in this manner in 1876.

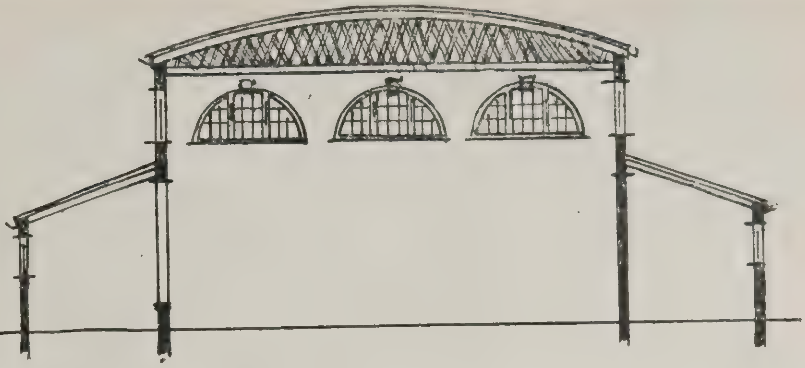


FIG 3.—SECTION SHOWING FORM OF ROOF SUITABLE FOR A ROLLER SKATING RINK.

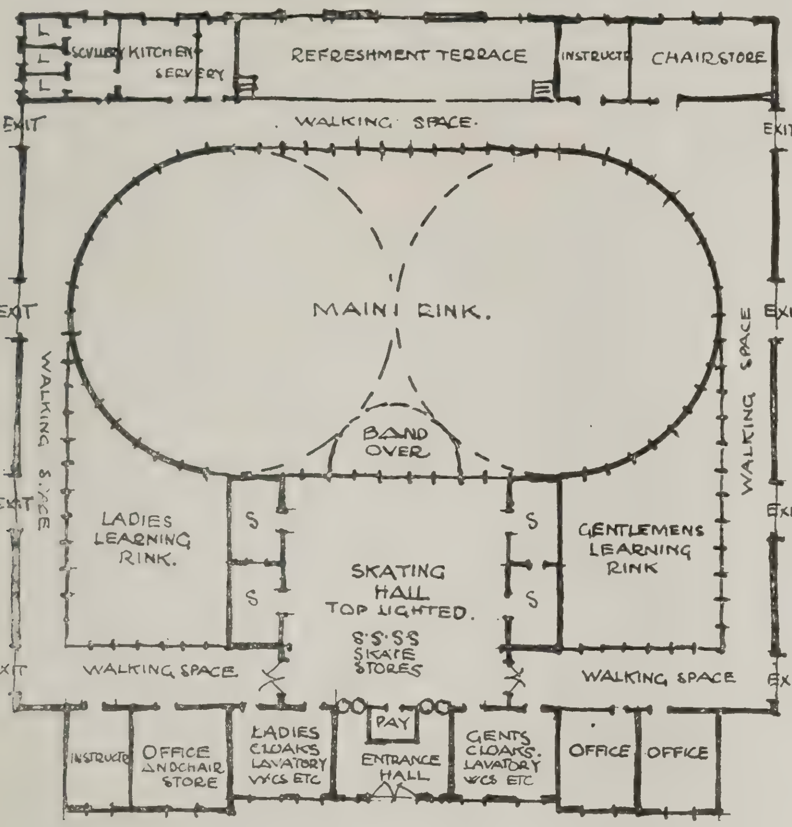


FIG 4. PLAN OF A ROLLER SKATING RINK NOW IN COURSE OF ERECTION IN A PROVINCIAL TOWN.

The more modern method of laying the floor is as follows. An ordinary floor is laid upon sleeper walls, the boards being placed diagonally, and the maple flooring laid on top of this. Rather wider floor boards are used than those previously mentioned, those now used being about 2½ to 3 ins. wide by 1 in. thick. These boards are tongued, grooved, and rebated, and secret nailed. The boards are laid straight in the centre, and follow the curves of the rink in diagonally-laid sections. It is to be remarked that there seems no reason to dispute the undoubted superiority of wide boards over the narrower battened floors used. It will in that case be necessary to provide effectually against the likelihood upon the part of the wider boards to shrink or turn up.

Reverting to a consideration of the plan in Fig. 1, we find that two annexes are provided to the rink for the convenience of the beginner, one for ladies and one for gentlemen, with an instructor's or supervisor's room between them. It is a radical mistake to provide the learner's annexe in the general hall, for learners, and especially those of the fair sex, are not encouraged by having to execute their probationary antics in the public view.

The panic and other exits should be governed by the rules pertaining to theatres and public halls of a similar description. Those now in use by the London County Council can be obtained from the London County Hall, Spring Gardens, London.

Pay office, ladies' and gentlemen's cloakrooms, attendant's room, and skate store are all provided at each side of the turnstile entrances. It is of great importance to ensure for instructors and attendants adequate supervision, and, in a good permanent structure, provision should also be made for a resident caretaker.

Figs. 2 and 3 show the best forms of roof and general construction. A curved lattice or bowstring roof, as in the one at Cardiff (Fig. 3) is greatly used, but the author pre-

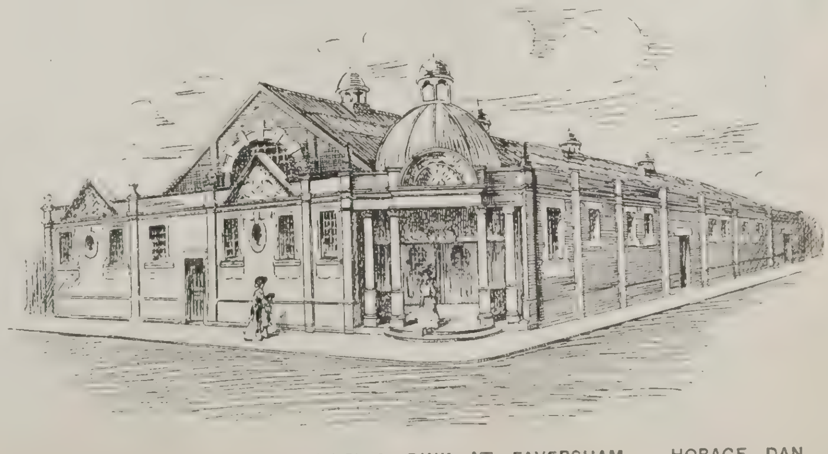


FIG 5.—ELEVATION OF A ROLLER SKATING RINK AT FAVERSHAM. HORACE DAN, M.S.A., ARCHITECT

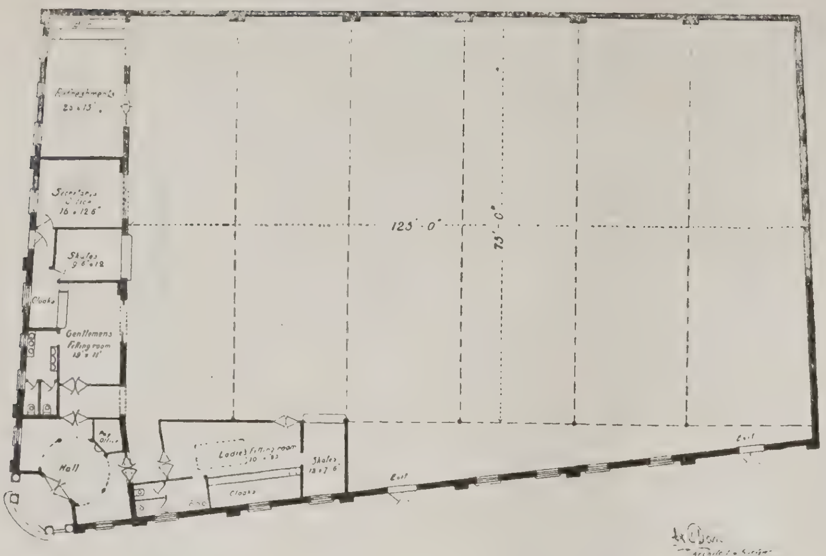


FIG 6.—PLAN OF ROLLER SKATING RINK AT FAVERSHAM HORACE DAN, M.S.A., ARCHITECT.

fers an ordinary iron roof of the type shown by Fig. 3. The bowstring roof would comprise three sets of timbers, these including the curved built up principal rafter, the tie-beam, and also the lattice struttings.

The principal would be double, and made up in short lengths of 4 in. by 1 in. scantlings cut to the curve. The lattice struts, 4 in. by 1 in. also would come in between the double principal, and also the double tie-beam, the latter, however, being out of 7 in. by 2 in. deal, properly broken and lapped at intervals.

The lattice struts will be about 1 ft. 6 ins. to 2 ft. centres and the whole will be well spiked together. Trusses of this description would be placed about 10 ft. centres, with a herringbone strutting in between.

The camber for the roof proper would be 6 ft. for 50 ft., and other spans in proportion, while the camber for the tie-beam would be 4 ins. for the same span. The roof could be curved corrugated iron sheets carried upon purlins in the usual manner, and it is easy to arrange for a ventilating ridge in the centre.

In Fig. 2 the rink should be clerestory lighted, except at the ends, where it may be considered desirable to arrange over the common rooms a spacious gallery for spectators. The side rooms can be roofed with a lean-to or flat roof.

The lighting is a point of vital and considerable importance. Most certainly it should not be by means of top lights proper, as the sun makes a building of this description too hot. Large semicircular clerestory windows, as shown, are much the best, and at the same time the most effective. Otherwise it may be as well to add to these clerestory lights some ranges of dormers in the main roof. The unsightliness of this main roof can be helped by arranging for a proper draw-curtain ceiling, fixed in a thoroughly adjustable manner between the principals.

The height of the section should be ample, and a definite scheme of ventilation should be adopted. All clerestory and dormer windows should be arranged to have a large portion to open by means of adjustable gearings. Artificial lighting will be electric arc lamps properly disposed, being suspended from the main roof principals.

Fig. 4 represents an important rink now being erected in a large provincial town, while Figs. 5 and 6 show another rink at Faversham, of which the architect is Mr. Horace Dan M.S.A., of Enfield. The Faversham rink, it will be seen, presents the difficulties of a corner site, while the other is upon an entirely open site. The chief feature comprised in this plan is the entrance, which is by way of turnstiles situated each side of a pay office, and giving entrance on to a large skate hall provided with chairs where skaters will put on their skates, and those not having their own may hire them from the skate stores at each side. The skate hall gives entrance to the rink proper, and the walking space around is to be used for emergencies and not for putting on skates. In some rinks it is customary to control the skating by means of a large illuminated changing notice. Thus the superintendent might for one period have "Ladies Only," then perhaps "Couples," then again "Gentlemen Only," then "Skate Slowly," "Stop," etc. This is the intention in the plan under notice, and consequently the space around the plan is so arranged that people can have speedy access through the open post and rail barricade.

The learners' annexes (ladies and gentlemen's) are off the main rink at each side, and though given a certain amount of privacy, they themselves can also watch with good effect the more skilful skaters upon the main rink. The rest of this plan is self-explanatory, though attention is drawn to the excellently arranged panic exits. It is also to be mentioned that all doors should, of course, open outwards, and be fitted with good panic bolts. It is possibly the intention in this plan at some portion of the day to devote one of the learners' annexes to the purposes of a prize tournament for figure skaters, and of general fancy skating.

A word about the (more or less) open-air rink. There is an exceptionally good one at the White City, Manchester, the huge rink being covered on top but left open at the sides. The plan (Fig. 4) shows roller shutters at the sides, so that in hot weather the whole of one or both sides can be advantageously opened up.

It is to be regretted that in numerous buildings of this character too little attention has been devoted to the elevation. Such a building demands unusual treatment, and no little skill is required to make the relationship of its various parts architecturally recognisable. The design of better-class public baths seems to offer a suitable precedent for effective though somewhat expensive treatment. Where stone cannot be used, however, dignified and excellent effect might be obtained from the use of rough-cast and brickwork. The sketch elevation shown by Fig. 7 explains the author's ideas and suggestions in regard to these points. Here cement rough-cast is plentifully employed together with some brickwork in the form of plinths and piers. Stonework need only be used in a very limited degree, but it would seem to the writer that such a building might be easily and effectively treated with some decorative tile-work of a good character, and in the sketch under notice some colour has been suggestively introduced in this manner. The brickwork will be carried out in a blue glazed brick, relieved with green at places. This will harmonise well with the grey of the rough-cast surfaces, the green roofs, and the white painted woodwork.

Speaking at the ordinary general meeting of the London and Provincial Bank on the 19th inst., Sir F. G. Banbury, M.P., who presided, said that he believed that the cement and brick trades were never in a worse position than they were in at the present moment, and the iron trade was bad.

* * *

The governing body of Worksop College, Nottinghamshire have decided to extend the present accommodation. The new buildings will include a science block, drawing and music rooms, a dormitory, library, masters' rooms and class rooms. The chapel will also be built at the same time. The work has been entrusted to Sir Aston Webb, R.A.

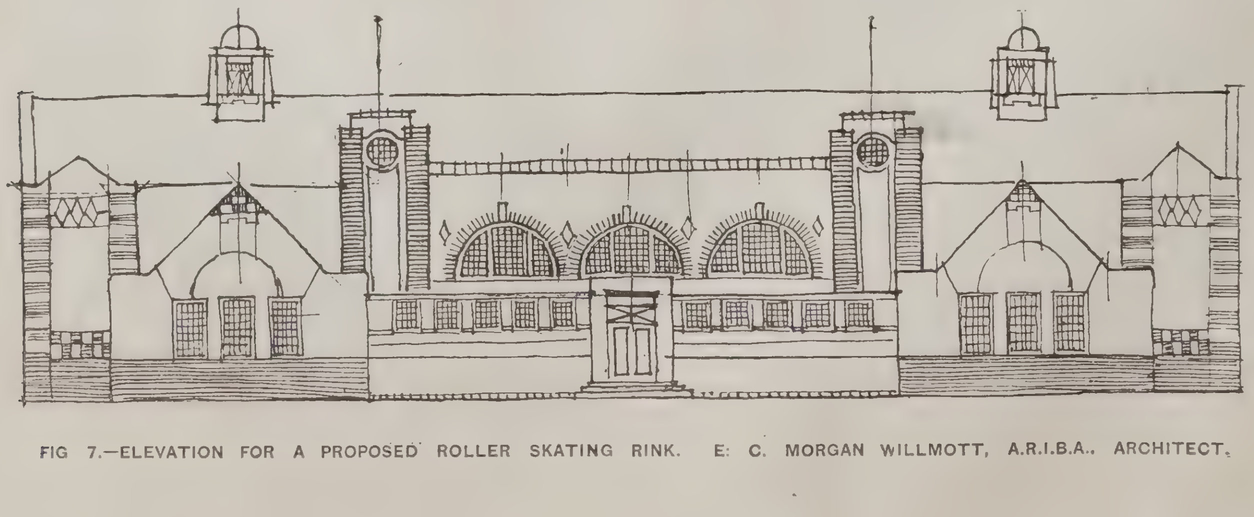


FIG 7.—ELEVATION FOR A PROPOSED ROLLER SKATING RINK. E. C. MORGAN WILLMOTT, A.R.I.B.A., ARCHITECT.

PAINT BLISTERING: ITS CAUSE AND CURE.

No question concerning defects in house painting is asked more frequently than this: "What is the cause of paint blistering?" And it is somewhat remarkable to note that, in perhaps nine cases out of ten, the fault is attributed to low grade or adulterated materials, although, speaking broadly, one might say that this is never the real cause. If we were to use for example, a white paint composed of 80 per cent. barytes and 20 per cent. of white lead, it might or might not prove durable, but it certainly would not blister unless—and here we reach the root of the matter—too much oil were used in mixing it, and other adverse conditions existed; but, given the same conditions, blistering would result just the same if the finest pure white lead had been employed. From this it will be seen that the pigment as a rule had nothing to do with the trouble. It should be said at once that there are many conditions in house painter's work, some of them totally different from others, to which the grave defect of blistering may be attributed. But there are three which occur much more frequently than any others, and to these we will first direct attention. They are (a) improperly mixed paint; (b) improper application; (c) moisture. The first of these causes has been already mentioned. If too large a proportion of oil is used in a paint, blistering is very likely to occur, even though the very best materials have been employed. Indeed, it is said that an architect, being struck with the fact that turpentine entirely evaporates, specified that the paint on a certain job should be made of pigment, linseed oil, and driers only, without any turpentine being used at all. Of course, the result was a fine display of blisters on every part of the work. Turpentine, as a matter of fact, plays an important part in painting, because it permits of the paint being applied in very thin coats, and when this is done the risk of blistering is greatly reduced.

Under the head of the application of the paint we had two important defects which are often met with and both of them contribute largely to blistering. The first is that too much paint is applied, or, as the painter would say, the work has not been sufficiently "brushed out." An inexperienced painter will almost always use far more paint than he should; he "slobbers it on" instead of "brushing it out." The rule in applying oil paint is that it should be used as though it cost a guinea an ounce, or as if there was evidently not sufficient paint to complete the work and an effort was made to stretch it out, so to speak. Within reasonable limits, then, the less paint actually put on in each coat, the less likely is the liability to blister. At the same time, it is necessary that the coat be sufficiently thick to hide the surface to which it is applied—in other words, to retain its "body" or opacity.

From what has been said, it will be seen that when work is particularly prone to blistering, extra thin coats should be applied; although this would probably not prove of much advantage if the cause of the blisters was moisture. But on ordinary dry wood several thin coats (even omitting the oil altogether, but adding a little goldsize to bind the particles together), will usually effect a cure. Such coats will dry "flat," or without gloss, but this can easily be remedied by varnishing, or, if this is too costly, adding a little varnish to the final coat of paint.

Another reason for blistering is that there is not sufficient adhesion between the several coats. There is a popular delusion that it is necessary that one coat should be thoroughly hard before another is applied, but this is quite wrong. Let the reader carefully examine some blistered paint work—let him break one of the blisters, and he will be almost sure to find the priming quite intact underneath. Now, if, as commonly happens, an excess of red lead were given to the priming, it would quickly dry very hard; and if an oily coat were applied, perhaps too liberally, on top of it, there would be no union between the two coats, and blistering would, under the influence of the sun, be nearly certain to result. Sometimes ochre is used for priming; and as this dries very hard, the same result is often brought about. If, however, each coat of paint is applied when the one underneath has not become quite hard, a key will be formed, especially if the coats are mixed alternately "sharp" and "oily"—i.e., with little or no oil in every other coat. Bearing on this subject, a useful experiment may be performed, which is to give a good round coat of oily paint to a piece of slate, and, when this is quite dry, exposing it to the action of the sun. Blistering is certain to result.

It should not be imagined from what has been said above that it is advisable to give one coat of paint upon another that is not fairly dry. When this is done, blistering is very likely to occur. The point is that the undercoat should not be very hard.

The second great cause of blistering is moisture. This may arise from imperfectly seasoned timber, which is always liable to this defect; for it must be remembered that if the paint is applied to timber that is not quite dry when a house is erected, the sap contained in the wood is locked in, so to speak—has no chance of drying out—and hence will be drawn by the sun, and almost invariably cause blistering. Quite frequently, however, in old houses, paint-work will be found to blister, although the fault has never appeared before. In this case close investigation will probably show that a defective gutter, or something of the kind, has caused dampness, which enters the wood and gives rise to the trouble. Quite frequently painted work which is in other respects perfect will be found to blister around the knots. This is due to the fact that there is usually a good deal of resin in the knots, which causes trouble, and the usual plan of applying shellac over these knots to prevent the exuding of this resin may, under certain conditions, give rise to blisters, because shellac does not afford a very good key to the paint; and hence it is that some painters prefer to give the knots a mixture of red lead and glue, or of silver or gold leaf.

As to the remedies for blistering, of course the best remedy is as far as possible to avoid the cause; but in obstinate cases there are two remedies which may be tried. The first is to burn the paint off to the wood, or to use one of the liquid paint-removers, which are now becoming so popular. Then give four to six coats of paint, according to the finish required, each coat to be mixed quite flat—that is, without oil, but with the addition of a little goldsize. If six hours is allowed between each coat, it will be sufficient, because these turpentine coats dry very quickly. Of course there will be a little oil in the mixture, as the colours which are to be used are those ground in oil; but the coats will be exceedingly thin, and will dry without gloss. A little gentle rubbing down between the coats is desirable, and the work is finished with a coat of good varnish. If it is exposed—as, for example, in the case of a front door—special "front-door varnish" should be employed. This method is similar to that followed by carriage builders, who obtain such beautiful results in their work.

Another and in many respects a better plan is to use a good washable water paint, and this almost invariably effects a cure. It is very inexpensive, and the writer has known many cases of woodwork exposed to the sun which has blistered for years, the blistering finally having been cured by using a couple of coats of washable distemper with one flat coat of paint over; then an ordinary coat of oil paint or a coat of varnish as may be desired. This method cannot be too widely known; and if the reader will experiment, he will find that he will probably be as much gratified at the result as the writer was when he first tried this method.

J.

THE BUDGET AND BUILDING.

A Contractor's Opinion.

Mr. Samuel Chapman, Unionist candidate for Perth, has received the following letter from Mr. John Anderson, of the firm of P. and W. Anderson (Limited), masons, builders, and public works contractors, Glasgow, who, in conversation with Mr. Chapman, informed him that the firm (which employs more men than the whole of the other Glasgow builders) were on the point of buying a large extent of land for building purposes, but after considering the effect of the Budget proposals had given up the idea, and bought Consols instead:—

Dear Mr. Chapman,—Referring to my conversation with you, I hope the electors of Dumfries Burghs realise the serious effect the Budget proposals would have on the building trades. As you are aware, Dumfriesshire stone is used all over the country, and the prosperity of the quarries depends entirely upon the demands from the large towns throughout Scotland. The increased taxation will certainly put a stop to investors placing their money in property, which at the moment is almost unsaleable, the increased taxation making it quite prohibitive as an investment. The building industry, upon which the prosperity of Dumfriesshire so largely depends, will thus receive a serious check, resulting in the further closing down of quarries and a large increase of unemployment. The taxation of land will not increase building under the proposed new conditions. In fear of further taxation, the investor will not hold land at any price. Supposing, however, a landowner is prepared to sell at a very low figure, his difficulty would then be to find the investor who would build on it, owing to the increased burdens placed on property. Irritating as the proposals of the Budget are, the situation is seriously aggravated, for, according to Mr. Keir Hardie, "If the Labour party in the House of Commons had been twice its size, the tax would have been twice as big." The absurd proposal of taxing increased value, and the large addition to the fees for transferring property and creating bonds, etc., simply prohibit all enterprise. The result will be the transfer of capital to foreign investments that will not be subject to those provocative charges, and in this way it will be the working man that will suffer most.—Wishing you success, with kind regards, yours faithfully, John Anderson.

The Dulwich Estates.

Referring to the reply of Mr. E. T. Hall, F.R.I.B.A., last week, Mr. Evan Spicer, L.C.C., writing to "The Daily News," says that "I cannot help feeling, from my personal knowledge, that the governors are proceeding on the right lines in the best interests of London. I would strongly urge that nothing should be done with their uncovered land to force houses upon the market until they are actually required. At the present moment I think it is of far greater importance to the health of London that all open spaces within five to six mile area should be retained as long as possible for the benefit of those residing in that district. The London County Council are, I believe, at the present moment seeking for ground suitable for playing-fields, and it is not an easy matter to find. . . . My firm conviction is, therefore, that open spaces, say, within a radius of six miles of London, are far more valuable to our young people in the interests of health and general well-being than if they were covered with houses."

The British Constitution Association Deputation to Mr. Lloyd George.

The memorial presented to the Chancellor of the Exchequer by the British Constitution Association on the 20th inst., contained the following clauses of particular interest to builders:—

(4) In practice the taxation of increment value would lead to extraordinary anomalies and injustice. For instance, Land Companies which buy land wholesale and sell retail are engaged in the very work of development which the Finance Bill professes

to assist; yet as the Bill is framed the plots into which, as part of their business, they divide the land, would, while they remained unbuilt on, be subject to the duty of ½d. for every pound of their capital value—which would be in effect to tax a tradesman on the stock which for the time being he had on hand and was unable to sell—in other words to penalise him for trading in land.

(5) Again, land cannot as a rule be placed on the market without considerable current expense for management, office rent, surveys, road-making, advertisements, auctions, etc. For payment of these expenses and for providing interest on capital borrowed, and dividends on capital subscribed, practically the only source to which a Land Company can look is the difference between the book value and the selling price of the land in which it deals. Of that difference the Bill proposes to confiscate one-fifth, leaving four-fifths out of which the whole of the administration expenses are to be met, and the losses incurred in lean years made good. It is not too much to say that, unless the sales are much more rapid and remunerative than is usual, no dividends would under these circumstances be paid by a Land Company—that most existing Land Companies would be absolutely ruined—and that this form of enterprise would become a thing of the past.

(10) One of the professed objects of the Bill is to increase building and cheapen houses. The proposed Reversion Duty would operate the other way. It is too often forgotten that the supply of new houses depends in the main on the operations of the enterprising builder who puts up buildings for which he thinks there will be a demand, and takes the risk of the market.

(11) It is quite unusual for the man in want of a house to build the house for himself. The building-lease system suits the enterprising builder because it does not involve a lock-up of capital in the purchase of the fee simple. A Reversion Duty which would tend to increase the ground rents demanded and make owners more reluctant to grant such leases would clearly discourage builders, who would also of course be discouraged by the Increment Duty.

(13) The proposed legislation would introduce complications and increase costs in connection with the purchase, sale, and leasing of land, and is entirely opposed to the principle of free trade in land. It appears to be based on the idea that unearned increment on land is "regular, normal, and progressive." This is very far from being the case. The value of land, as of other commodities, goes up and down, and though on the whole and in the long run there may be an increase, yet in large districts and for long periods there is often a steady decline.

(14) The valuations and revaluations suggested in the Bill would cause endless trouble, inconvenience, and expense, and could never be put on a satisfactory footing.

(15) The immediate effect of passing the Bill would be to depreciate the capital value of nearly all interests in land, probably to an extent much greater than would be shown by strict actuarial calculations.

Among the speakers who addressed the Chancellor were Lord Hugh Cecil, Mr. Herbert Michell (British Land Co.), Sir William Chance, Mr. Edward Bond, Mr. Edwin Evans, and Mr. George Hubbard, F.S.A. (Royal Institute of British Architects), who said he had been appointed by the Council of the Institute, which consisted of some 3,000 members of the profession practising in all parts of the country. They felt the proposed land taxes would be unjust to a large section of the community, and would specially injure all industries in any way connected with building.

Mr. G. A. T. Middleton (Society of Architects) said that the body on whose behalf he appeared contained some 700 architects practising in Great Britain, and that the Council of that body viewed with considerable dismay a proposal which, so far as they could see, would have a deterrent effect upon building operations. He desired to associate himself with all that Mr. Hubbard had said.

Mr. Alex. R. Stenning (President of the Surveyors' Institution) was unavoidably absent, and the remarks he would have made were handed in. In the statement Mr. Stenning said: The valuation of large estates in which villages, railway stations, and perhaps the suburbs of large towns form part, was no small matter. It was most important that the first valuation should be done with special care; this would take a lot of time to work out, and the cost of making such a valuation would amount to a large sum of money even if done on the most moderate terms. If a valuation was considered necessary for the interest of the community surely the cost of such valuation should be paid for by the community. He did not think fifteen millions sterling would be an unreasonable figure for the valuation which the proposed land taxes would involve.

The Chancellor of the Exchequer, after complaining that the speeches to which he had listened consisted mainly of the sort of political arguments which he had heard for months, said that the advantage of deputations was that they enabled Ministers to hear at first hand from the persons interested what their view was. There were gentlemen there who could give him invaluable facts, but this they had not done. They had the whole of the facts at their command, and if they could demonstrate that any part of the Bill was unworkable or inequitable, or unjust, he invited them to send these facts to him, and they should receive his careful examination.

In addition to the architects who spoke, Messrs. Mark H. Judge, Max Judge, Percy Leeds, F.R.I.B.A., R. M. Lucas, F.R.I.B.A., and Percy B. Tubbs, F.R.I.B.A., were also present.

Correspondence.

The Editor declines responsibility for the statements made by correspondents.]

The Building Trade and the Budget.

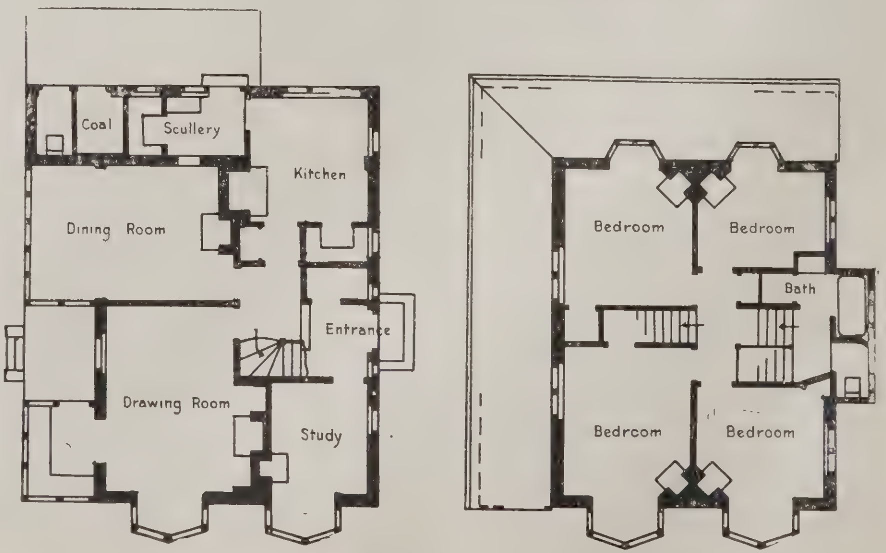
To the Editor of THE BUILDERS' JOURNAL.

DEAR SIR,—With reference to the article in this week's issue of your paper, I can hardly think that any builder who understands the present condition of matters as regards land and houses, and who has taken the trouble to familiarise himself with the details of the Budget, can believe that if passed into law the Government's proposals will hurt the building trade. The items culled from Unionist papers as to projected jobs being dropped may be true enough, but this is a matter of every day occurrence. Some of it may be due to the same spirit which prompted the trust magnates in the United States to upset matters when Mr. Roosevelt was endeavouring to effect reforms. A portion of it is doubtless due to the uneasiness that has been engendered by interested politicians and the landed classes in the minds of the lay person. This uneasiness has hurt the building trade for many years, and in the best interests of the trade, Mr. Lloyd George's proposals, which are of an extremely mild character and would do little harm to even the landed interest, should be allowed to pass. The question has been before the country too long; and the principle of taxing land values has been approved over and over again in Unionist Parliaments, and by almost all the municipalities in the country. Besides contract work, I have myself built during the last 12 years almost two thousand houses, and I have never been able to see that the building trade was helped by the landlords making me pay up to two hundred pounds per annum per acre for virgin ground that was formerly let to farmers at not more than two pounds per acre. The whole agitation is for the purpose of relieving buildings of the whole or part of the burden of local taxation which lies on the back of the building trade. Here in Glasgow and many places are in a worse plight, any one using twenty shillings' worth of the products produced by me has to pay six shillings and eightpence in taxation, and if this is the way to encourage the community to make use of buildings or to expend money on producing them, then logic is indeed dead. Local taxation cannot all be planted on the land; but some of it can, with the additional advantage of reducing the power of the landlord to exact exorbitant feuing rates. Other portions can be levied, as in some towns in Germany, by means of an income-tax; and this would ensure that the unmarried workman sharing half of a room would pay at least equally with the married workman who must needs have housing accommodation for his family. A national movement to relieve housing accommodation of local taxation would have enormous driving power behind it; and the result would cause such a boom in the building trade as has never yet been seen. What do builders think?

Yours faithfully,

JOHN A. MACTAGGART.

[The insertion of this letter—which is perhaps rather too strongly tinged with political preference to be entirely suitable to the columns of a trade journal—will, we trust, be taken as an evidence of our desire that both sides should be heard on a matter that seems to us to be of vital importance to architects and builders. We urge readers who may feel disposed to reply to it, to keep as clear of political allusions as the circumstances will admit. The "Builders' Journal" is not an organ of political opinion.—ED.]



"HIGH HEDGES" STUDLAND BAY, DORSETSHIRE.
J. E. MUNDELL, A.R.I.B.A., ARCHITECT. *(See also centre plate.)*

Plaster Prices at Manchester.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—It may be interesting to note the low prices at which work is being actually taken in Manchester suburbs for plastering six-roomed houses. The following are low ordinary prices:—324 yards two-coat plaster walls, at 6d. £8 2s.; 120 yards two-coat lath and plaster ceilings, at 1s., £6; 80ft. molded cornice, at 4d., £1 6s. 8d.; 35ft. cement skirting, at 3d., 8s. 9d.; pointing windows, 5s.; beam (panelled) with caps and trusses in hall, 10s.; total £16 12s. 5d. The above work, valued by us at £16 12s. 5d., is being done at £8 per house.

J. B. JOHNSON AND CO.

Liverpool.

TIMBER WHARF AND DOCK CONSTRUCTION.

By Hugh Cregeen, A.M.I.C.E., P.A.S.I.

The following types of timber wharf construction may be useful to contractors.

Some of them are in use in various places in this country at the present time, and they have been erected instead of permanent and solid structures on the score of economy, and so may be recommended for temporary purposes.

Figs. 1 and 2 show the cross section and elevation of a loading wharf for stone traffic alongside a railway siding, standing 7ft. above rail level, to enable carts of material to be tipped direct into wagons without the additional expense of handling by manual labour.

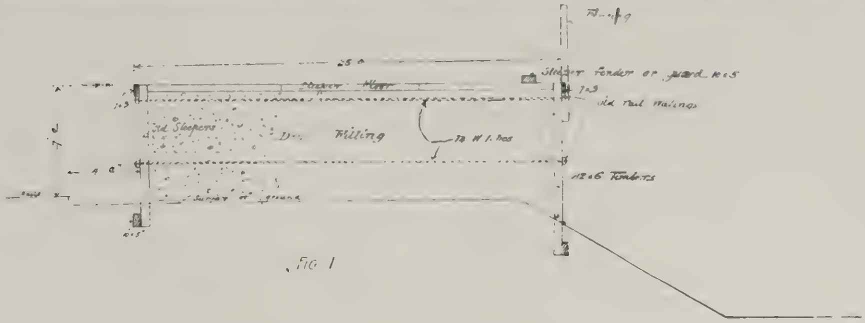


FIG 1

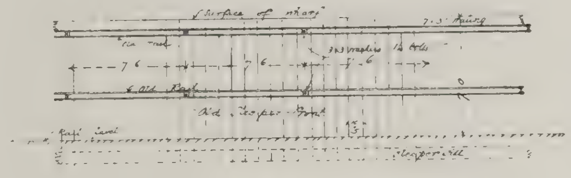


Fig 2

The dock is constructed thus:—Sound second-hand creosoted sleepers 9ft. long, and in section 10ins. by 5ins., are placed on the ground to a depth of about 2ft., and these are secured by tie rods 1¼ins. diameter passed through old steel rail walings in a double row, spaced 7ft. 6ins. apart and run through from front to back of the wharf. The back wall being necessarily deeper on account of the bank sloping down, 12 by 6 timbers about 11ft. long are substituted in place of sleepers. Good dry filling material is then carted up and tipped in between the two walls until the top level is reached, a ramped incline leading thereto, and after the whole has consolidated, a corduroy or sleepered roadway is laid, on which the traffic is carried on.

A fender rail timber is spiked down all round the roadway as shown, and a substantial fence outside renders the use of the wharf safe for carts.

The whole of the outside surfaces are afterwards tarred and the railing painted, thus rendering the life of the structure as long a one as is possible with timber.

An approximate estimate of the cost of such a wharf 200 feet in length and taken exclusive of the incline approach would be:—

	£	s.	d.
318 old sleepers, 10 by 5, fixed in wall, at 2s.	31	16	0
720 ditto, laid in floor, 1s. ...	36	0	0
2,100ft. run creosoted timber at back, 1s.	105	0	0
62ft. cube timber in longitudinals, and fixing, 3s.	9	6	0
283 yards run old steel rails, drilling and fixing, 2s. 6d.	35	17	6
75 yards run fencing at back of dock, 7s. 6d.	28	2	6
3¾ tons W. iron ties, £17 ...	63	15	0
Spikes, etc., say	3	10	0
1,390 yards cube dry filling, 2s. 6d.	173	15	0
Tarring and painting	12	0	0
or about 50s. per ft. run.			
	£499	2	0

Figs. 3 and 4 show a type of heavy timber wharf construction carried out at a dock made on land reclaimed from a river bank, in order that barges might be moored alongside and unloaded. The description is as follows:—

A double series of whole timber pitch-pine piles were driven into the river bed until firmly secured, each bay being about 9ft. 4ins. apart centre to centre, after which 14 by 14 longitudinals, five in number, one below the other, were inserted and bolted through from the piles. Against these, in front, sheet piling of 14 by 7 stuff was driven and secured by means of waling pieces, bolted at each alternative sheet pile with 1⅛in. bolts. The main piles in each bay were as an additional safeguard, held back as shown on the section by means of 2in. tie bolts fastened to land tie piles 14ins. by 14ins. driven into the bank at a distance of about 24ft. from the face line of the wharf.

The main front piles were continued up about 2ft. above the surface level of the wharf to act as bollards or mooring posts, and fender timbers 12ins. by 6ins. in size were spiked on the outside as a protection to the piles from the rubbing of vessels moored thereat.

The ground was, after the completion of the timberwork, filled in with dry material and a layer of block chalk 2ft. thick placed immediately behind the piling to assist drainage, after which the surface of the wharf was finished with metalling.

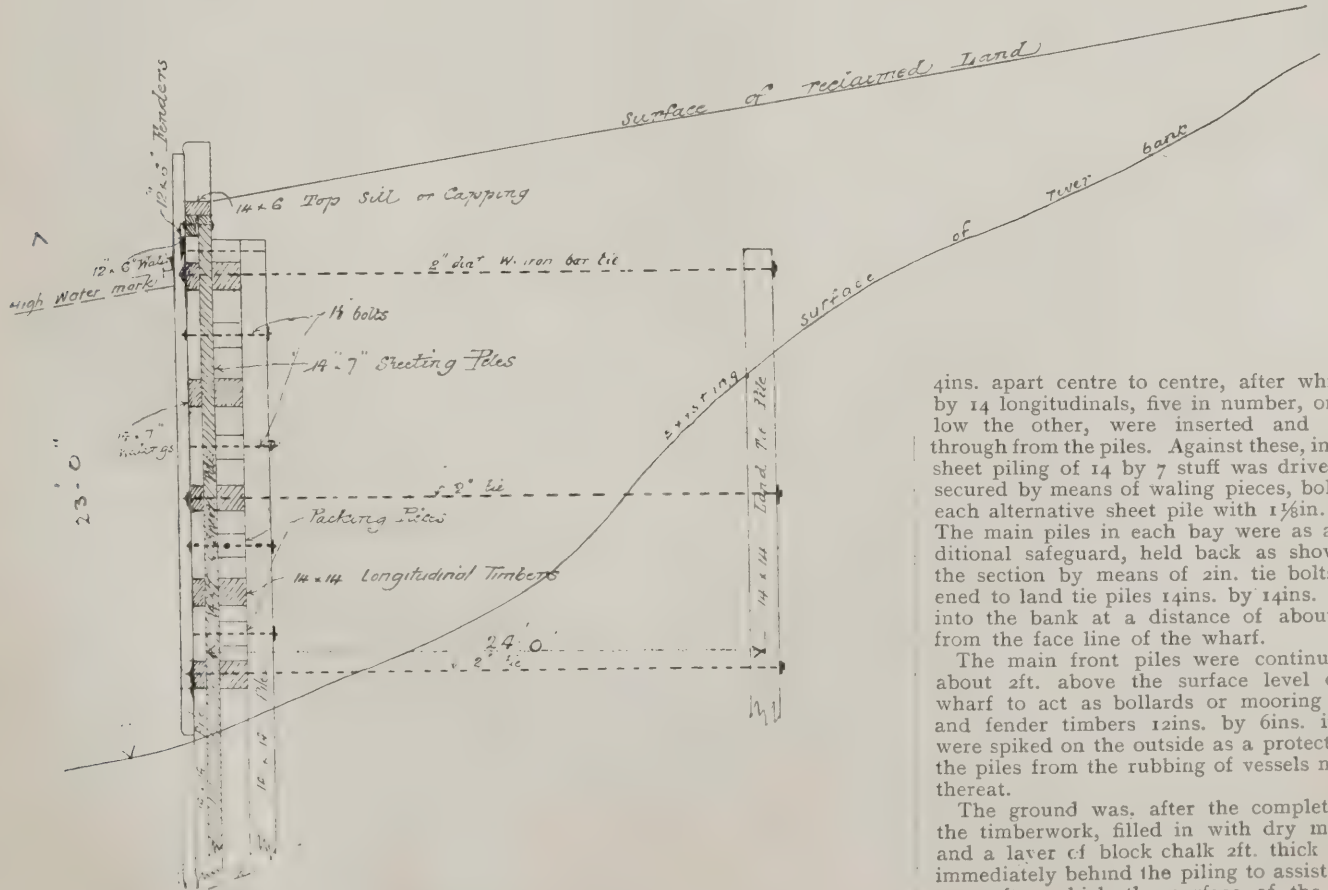


FIG. 3.—HEAVY TIMBER WHARF CONSTRUCTION.

This wharf was carried out at a dock made on land reclaimed from a river bank.

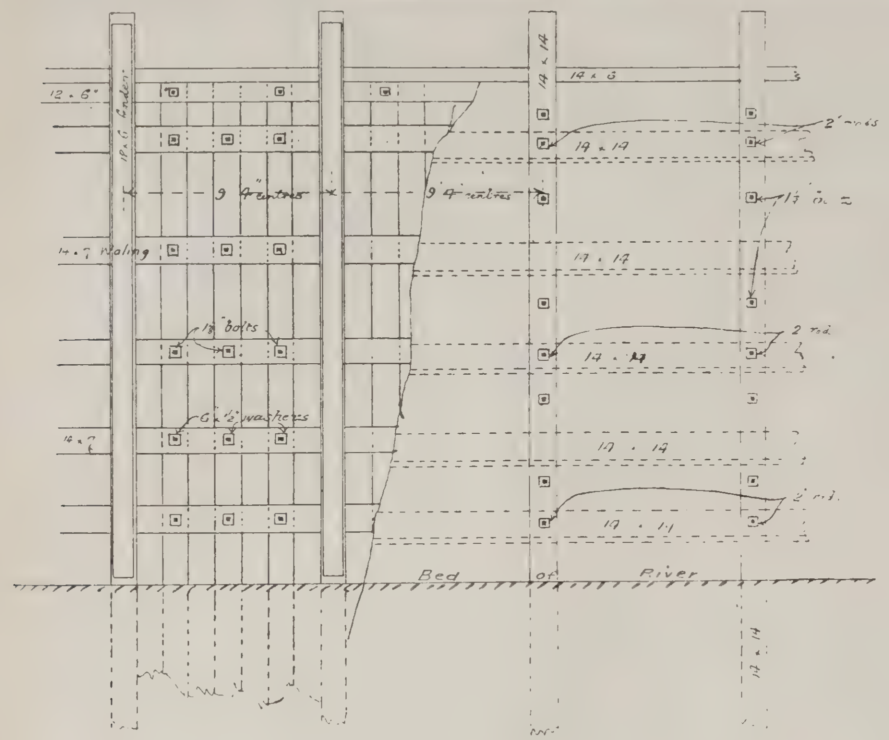


FIG 4

Fig. 5 is a section of a small wharf front constructed of old sleepers, at which barges can unload at various states of the tide, there being two levels one below the other. The sleepers are secured by iron tie rods, passed through 11 by 5 walings and connected with land ties.

Figs. 6 and 7 are a section and elevation respectively of a shallow dock adjoining a railway, and is 3ft. above rail level. This also is made out of old sleepers, which are driven in as uprights at 4ft. 6in. intervals, and five rows of the same material are fixed behind these, the whole being as in the last type, tied back by means of 1½in. tie rods to land ties.

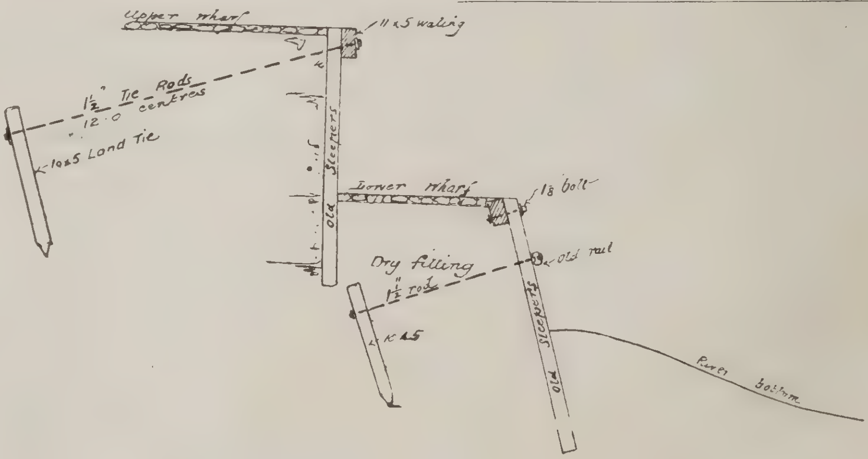


Fig. 5

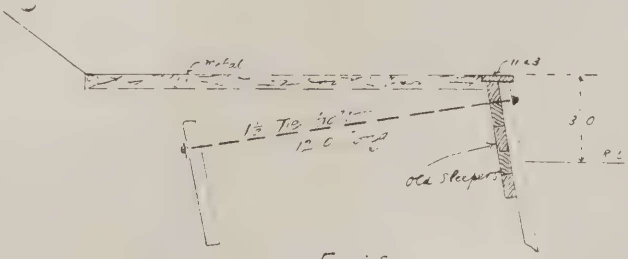


Fig 6

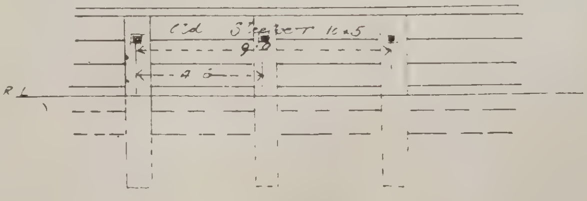


Fig 7

TIMBER WHARF AND DOCK CONSTRUCTION.

Our Plate.

House at Rowledge near Farnham.

This house is erected upon a very pleasant and well-wooded site. The walls are externally covered with rough cast and the roof with old tiles; the arrangements generally are convenient and modern. The hall, from which a pretty view of the garden is obtained, extends the full depth of the house. The drawing-room and dining-room and one bedroom have spacious bay windows. The work was carried out by Mr. A. G. Mardon, of Castle-street, Farnham, and the architect was Mr. Arthur J. Stedman, of South-street, Farnham.

"High Hedges," Studland Bay, Dorsetshire.

This house was erected on slightly sloping ground at Studland Bay, a place far famed for its beauty. The design was greatly influenced by the desire to command the delightful views of the bay and Poole harbour over the tops of the surrounding trees. The accommodation includes dining-room, drawing-room with alcove and study, four bedrooms on 1st floor, with bath-room, linen, etc., and 4 smaller bedrooms on the top floor. The walls are hollow and roughcasted, and with dark red tiles for the roof. The garden is weather boarded, with tile roof, and the woodwork is treated with Solignum. The contract for the house was only £612. The builder was Mr. Geo. Hardy, of Swanage, and the architect, J. E. Mundell, A.R.I.B.A., P.A.S.I., of 157, Wool Exchange, London, E.C. and Poole, Dorset.

PRACTICAL CONCRETING.

(*Continued from p. 57, No. 754.*)

It is important in measuring that the boxes should be filled; an inch too much of the large box and an inch too little of the small one will make all the difference between a good or a bad gauge, and must be avoided. A common practice of foremen is to have the aggregate stored round the mixing platform, and if the latter is only just sufficient to hold the whole contents of the gauge, in mixing and turning over, the gauged part frequently comes perilously near the ungauged portion, and unless the clerk of works keeps a close look-out, shovelfuls of the latter will be added to the former, to the loss of the true proportions as specified. This the clerk of works can remedy or avoid by seeing that a clear space is left all round the platform, or if the site is too cramped to allow of this, then scaffold-boards or running planks can be stood on edge to separate the two classes of materials. The mixing platform is easily formed of scaffold or other boards of the same thickness.

6.—Mixing.

Mr. C. H. Colson, an engineer of great experience, once said at a meeting of the Society of Engineers, "It has been the habit to value Portland cement concrete from the point of view that no skilled labour was needed in its preparation; that it was a material of so simple a character that any man who could use a shovel could mix it; was this correct? He believed that the more

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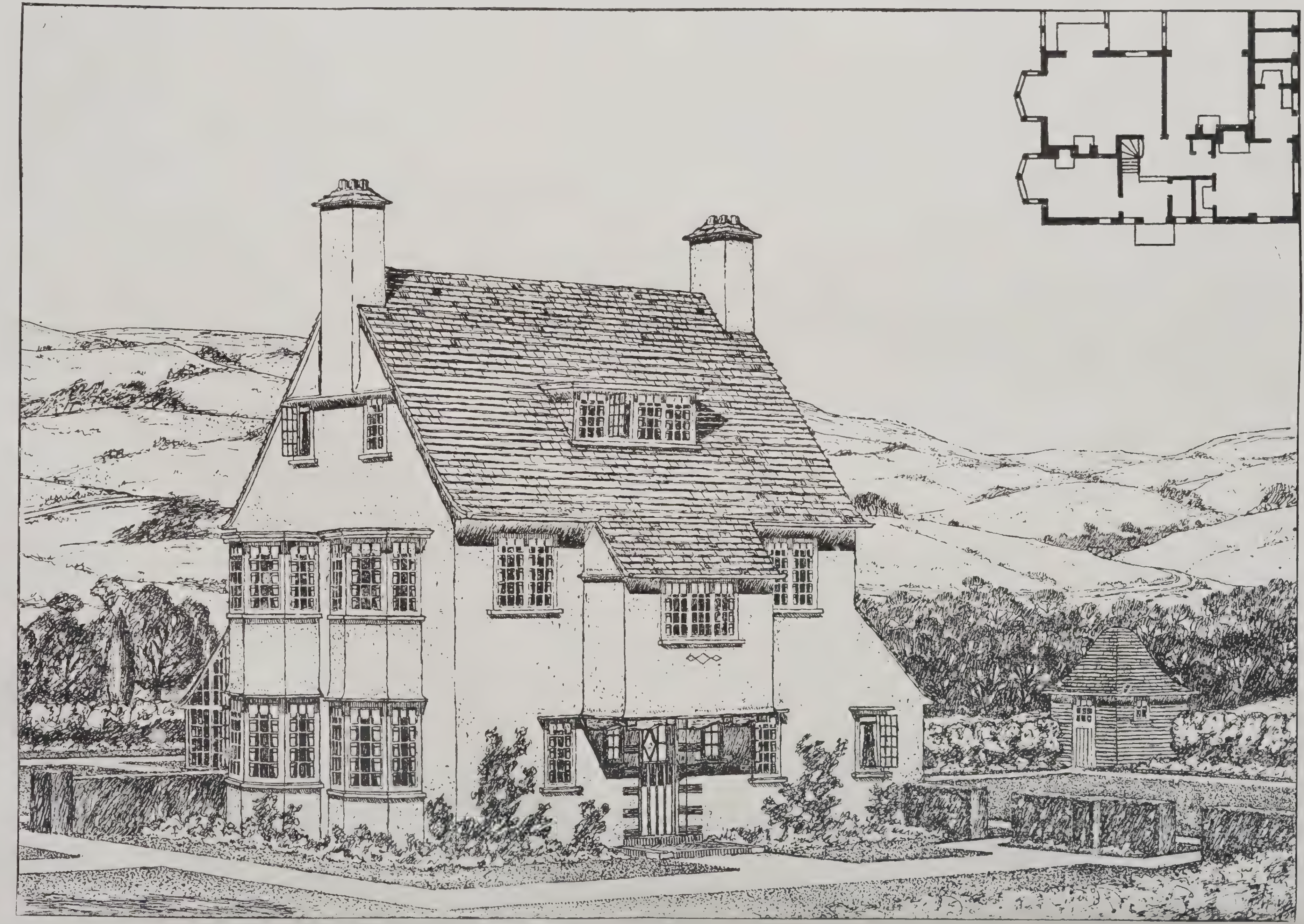
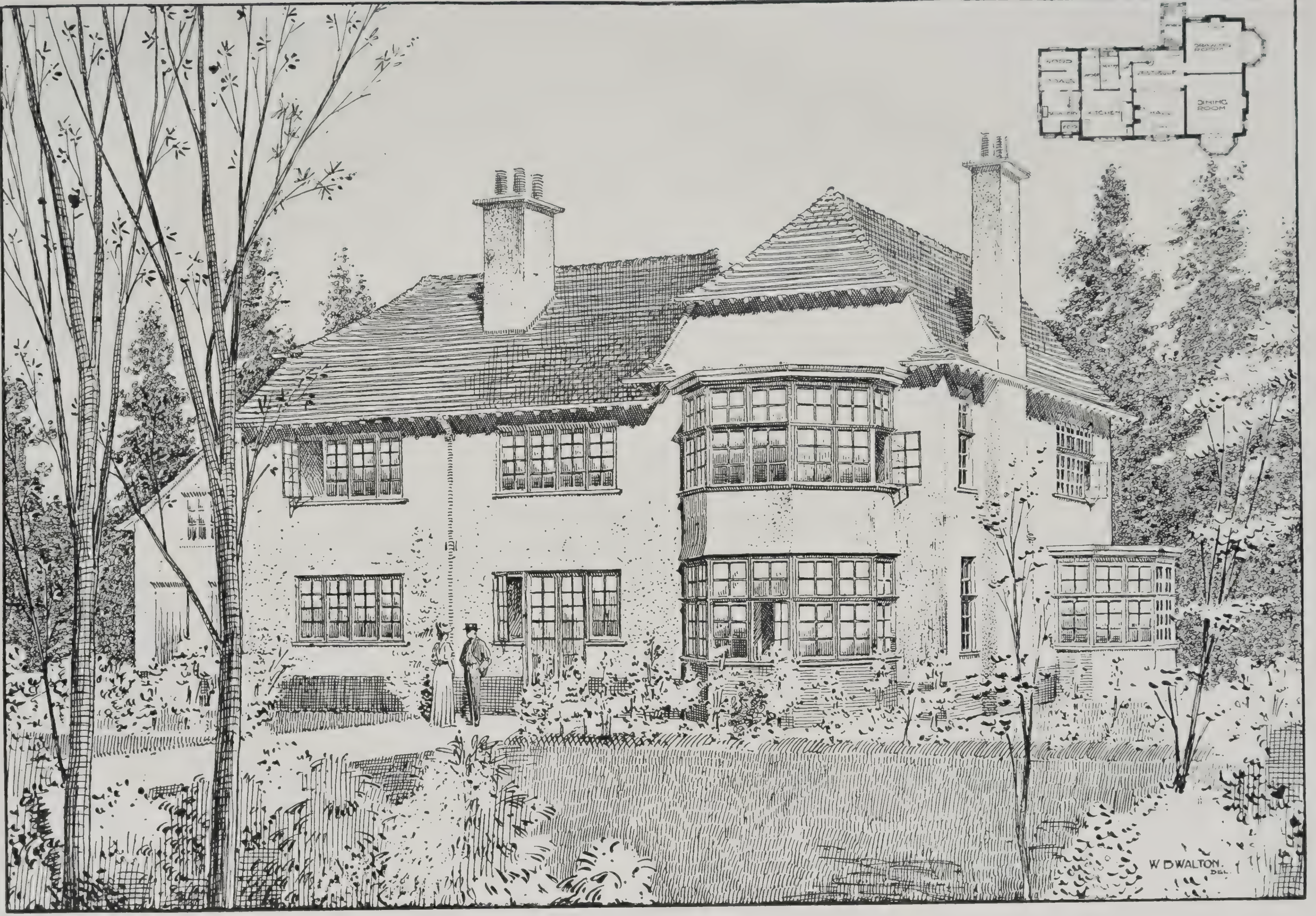


"HIGH HEDGES," STUDLAND BAY, DORSETSHIRE. J. E. MUNDELL, A.R.I.B.A., ARCHITECT.



HOUSE AT ROWLEDGE. ARTHUR J. STEDMAN, ARCHITECT.

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skill and thought exercised in the manipulation of concrete the more satisfactory would be the result. The mixing was often left to the care of men who had no feeling of interest in the matter, and therefore cared but little whether the mass was properly mixed or not."

As a matter of fact, in addition to the exact proportioning of the materials, the mixing itself requires close supervision. The platform should be well stiff-broomed prior to receiving the first of the ingredients, at each gauging, to free it from all loose dust, dirt, or soot. The aggregate should be watered if composed of broken brick or stone or similar porous substances, to avoid their soaking up the water required proper to the mixing. When one gauge has been brought to the platform, it must be turned over at least twice a day, before any water is added, which should be through the rose of a hose-pipe, or, if a large supply tank is near at hand, a watering-can with rose may be used, but there is always a risk of the "turners-over" continuing their work whilst the can is being replenished, so that some parts do not receive their proper share of water; on the other hand, if a hose-pipe is used, it must have a "waste-not" cock at the rose end to allow of the man manipulating it checking or stopping the supply to avoid saturating and drowning the mixture. The turning over whilst wetting forms the third turning; it should be turned over at least once more before being wheeled away to be deposited—twice for preference.

Method is necessary in the application of concrete as in most other matters. Whatever the concrete is to be used for—foundations, walls, floors, roofs, or any other purpose—equal care is necessary. When mixed by hand the desire on the part of many is to perform the operation as unsystematically as circumstances permit. It is unattractive work—about equal to that of mortar making—and unless proper care is insisted upon, amalgamation of the materials is not what it should be.

In this connection it is interesting to observe the way in which concrete is often made, and by no means difficult to judge the occupation, in a general way, of the men employed in mixing; a bricklayer's labourer, more especially, if his work has been confined to mortar making, chafes the concrete with the end of his shovel after the last turnover; he cannot resist the habit he has acquired in mortar making; the result is that if the aggregate is brick *debris* or furnace ashes or anything of a comparatively soft nature, some portions get chopped asunder, and he has undone in a minor degree the entire coating of the aggregate with cement.

The navvy, on the other hand, after filling the barrow with concrete and before wheeling it away, pats it round the sides with the back of his shovel, as he would do sand, earth, or gravel, but for no purpose. Nor will either of this class of mixers, as a rule, give the materials the wrist twist so essential when the concrete is being mixed, but simply move it from one position to another, not turning it over, as is necessary to ensure amalgamation of the materials.

The R.I.B.A. Committee specify that in concrete mixing, and when the materials are mixed by hand, "they are to be turned over and thoroughly mixed on a clean platform until the colour of the cement is uniformly distributed over the aggregate."

Hand or Machine Mixing.

If the size of the job warrants it, a mechanical mixer can be used, which gives good results, and on large works the concrete produced is considerably cheaper in cost per cubic yard. The clerk of works still has to see that it is accurately gauged, etc.

The eminent engineer to the Metropolitan Board of Works (Mr. Grant), however, half a century ago made interesting experiments with a view of ascertaining which was the best way of mixing cement, by hand or with a mortar mill, with the result that at three months old the hand-made mortar was double the strength of that made by a mill, and at twelve months three times the strength. The result is curious and inexplicable, but is evidence that the manipulation of cement has a good deal to do with after effects. The mixing of cement is usually a happy-go-lucky process, and the difference in its ultimate value should astonish many people.

Strength.

The question as to which is the better, the wet or dry mixing of concrete, has been much discussed. Recently in Germany there were given out the results of extended experiments covering some four years. From these reports the conclusion is drawn that the smallest amount of water which produces a mixture suitable for ramming gives the *strongest concrete.*

The results of these experiments confirm that which other experiments, covering shorter periods of time, indicated, and will not occasion any surprise. At the same time the concrete worker who attempts to use the smallest amount of water which will produce a mixture suitable for ramming will find many practical difficulties.

Skilled Labour.

The great obstacle will be the difficulty of securing "skilled" labour. The degree of skill and care required with such a mixture is so great that the ordinary labourer cannot be entrusted with the work, and prices are being cut so low that to train men to perform this work is well-nigh impracticable.

In a brick pavement that was being torn up preparatory to relaying, the bricks had been grouted with a comparatively dry mixture of cement and sand. The result was that the grouting only went about one-quarter way down the bricks, and in less than two years the pavement had become so rough that it had to be relaid.

Other pavements were examined where the grouting had been done with a mixture that would flow readily and could be swept into the crevices. In this case the grouting completely surrounded the brick and the roadway was a solid pavement.

Not only does a wet mixture of concrete allow the employment of less skilled workmen, but it insures against the injurious effect of the varying amounts of moisture found in the material used.

Porosity.

The proportion of water used in mixing the material is of greater influence on the density of the mass than is commonly supposed by those who have little experience in the manipulation and use of cement. If the paste is too soft it does not bind properly, in spite of the assertions of some people to the contrary. The actual proportion of water depends on the volume-weight of the mass, and where waterproof concrete or cement is required care must be taken not to use more than is absolutely necessary, as an excess of water makes the cement too porous when set.

Aggregates and Temperature.

The compressive strength of concrete and mortar, as influenced by the proportion of water used, was investigated recently by Herr Brabandt, a German railway engineer. The test cubes were 30cm. (about 12ins.) on a side, and were made in accordance with the rules of the "Deutsche Betonverein." They were stored in a shed, under wet sand, and were tested after twenty-eight days. The test results showed a certain proportion of water which gave the greatest strength, either more or less water giving poorer results. The conclusions drawn by Herr Brabandt from his tests on concrete are as follows:—1. The most favourable quantity of water for the mixtures commonly used is about 15 to 20 per cent. of the volumes of cement and sand. 2. Poor mixtures need less, rich ones more water. 3. The moisture already contained in the raw materials must always be considered. 4. The absorption of water by the gravel, ballast, or broken stone must be taken into consideration. The quantity of water thus required must be determined beforehand by tests, and added to the quantity needed for the mortar. 5. In cold seasons less water, in warm weather more water must be used. 6. With very rich mortar mixtures, with more cement than sand, the amount of water demanded is considerable, and may even reach 30 per cent. 7. It seems wise to determine the amount of water by tests, at least when required for large buildings, and to regulate it by general specifications.

To attempt to specify with any accuracy the quantity of water needed is, however, impractible; it cannot even be stated approximately. The aggregate is, perhaps, of an absorbent nature or the reverse; it may be quite dry or very wet; it may be composed of coarse, or of comparatively fine materials. Each of these conditions affects the amount of water needed, and it is only by practice that the proper quantity can be ascertained.

(*To be continued.*)

Builders' Notes.

The members of the Stourbridge and District Master Builders' Association held their annual outing to Holt Fleet, via Worcester, on Tuesday, the 13th inst., and, in spite of the unsettled weather, a most enjoyable day was spent. Among the party were Messrs. C. Griffiths (president), T. J. Mason (vice-president), J. H. Willetts (hon. treasurer), J. Stokes (president Worcester M.B.A.), and P. D. Folkes (secretary), and a number of manufacturers and merchants connected with the trade. The sail up the river to Holt Fleet was thoroughly enjoyed, and luncheon was partaken of at the Holt Fleet Hotel, where, after the toast of "The King," Mr. Stokes proposed the toast of "The Association," to which Mr. Griffiths responded. Mr. T. J. Mason gave "The Visitors," which was responded to by Mr. T. Freer Ash (Birmingham).

* * *

The employees of Messrs. Want Bros., builders, of Islington, had their annual outing to Brighton. The party arrived at their destination in good time, and immediately embarked on motors for the "White Horse," Rottingdean, returning later to Brighton to the "Unicorn" Hotel for an excellent dinner. After dinner Mr. F. G. Want spoke of the success of the business, and hoped to meet all employees in increased numbers on the next annual occasion. The health of Mr. F. G. Want and prosperity to the firm was pledged with musical honours. Then followed a trip to Devil's Dyke, where tea was served, the party returning from Brighton in the evening.

* * *

A few of the residents of Sutton and the adjoining district recently formed a committee to develop on artistic Garden City lines an estate of thirty acres, known as "Elm Grove," in the parish of Wallington, just where it joins Carshalton on the London road. It is proposed that profitable development on a co-operative basis shall go hand in hand with artistic development; that the trees shall remain; that the river shall not be converted into an underground drain; and that those who live on the estate shall have fresh air in plenty, a plot of land to convert into a flower garden, and substantial and sanitary dwellings. The committee have the option of purchase for £7,500. Subscriptions for stock and shares in the company to be formed under the name of the East Surrey Tenants, Ltd., have already been promised to the extent of between £1,000 and £1,500. The loan stock bears 4 per cent. interest, and in addition to the land and houses there is the security of the shares (a minimum of £30) held by each tenant. Mr. D. W. Cooper, Endwood, Carshalton Park Road, Carshalton, is the hon. secretary of the movement.

* * *

Members of the Southampton Master Builders' Association had their annual outing on the 15th inst., when a party, numbering forty-five, proceeded to Reading by train, and had a trip down the river Thames by launch, the delightful scenery being observed under ideal conditions, as the weather was fine. At Henley the party partook of lunch at the Little White Hart Hotel, Mr. J. P. Beer, the president, occupying the chair, supported by many of the prominent builders of Southampton and others connected with the trade. It being the first large gathering since the recent arbitration proceedings over the wages and rules question, the opportunity was taken of thanking the architects, builders' merchants, and others who gave evidence at the same. A vote of thanks was also accorded the hon. secretary (Mr. A. T. Doggrell) for his services in making such excellent arrangements for the outing. After lunch the trip was resumed further down the river, and tea was partaken of at the St. George and Dragon, Wargrave, following which the party returned to Reading, from whence they travelled by train to Southampton, which was reached about 10.30, the outing being considered one of the most successful in the history of the association.

* * *

Judging from the condition of employment for operative masons, the building and monumental sections of the granite trade at Aberdeen have improved, not only in the city, but also in some of the country districts. Work has been more easily obtained, and, although some of the jobs were completed, and, consequently, a number of men were paid off, fortunately other openings were soon found, so that on the whole employment has been more plentiful. In the city, trade has improved both in the monumental and building branches, though the building trade is still far below the normal state of affairs. There has also recently been evidence of a slight improvement in the granite trade of the city, though it is still far removed from anything like the activity associated in former times with building masons. Still, with the likelihood of several big jobs coming into the market soon, trade ought to be brisker in the latter part of the year than it has been so far. It is very probable that the new extension to the Royal Infirmary will be commenced before long, and this would go far to improve the prospects for the winter and the following spring, and would provide work during the dull months of the year when employment is difficult to obtain. The Prudential Assurance Company have decided to build new offices in Crown Street, and these buildings, once they are in course of erection, will provide a number of men with employment for some time to come. Another job which is likely to come into the market soon is the contemplated extension of Broadford Works. This, along with the other works already in hand or likely to be soon commenced, would seem to point to a long-looked-forward-to and much-hoped-for improvement in the building trade in the city. With the prospect of plenty of work during the fall of the year, and something to look forward to in the winter, the position of operative masons is brighter, and it is to be hoped that there will be no unnecessary delay in getting these contracts under weigh.

Proposed New Works.

The following new works, with others, were recommended for the consent of the London County Council at a recent meeting, subject to certain specified conditions:—

Erection of buildings on a site abutting upon Cambridge Circus, Minerva Street, Centre Street and Felix Street, Bethnal Green, on the application of Mr. W. E. Wallis, on behalf of the governors of the Peabody Donation Fund.

Erection of an office building on the site of Nos. 36 and 38, Queen Anne's Gate, Westminster, at less than the prescribed distance from the centres of the roadways of Queen Anne's Gate and the street leading from Birdcage Walk to Queen Anne's Gate, and with oriel windows, and a hood and pilasters, on the application of Messrs. E. Runtz and Ford, on behalf of the Anglo-American Oil Company, Ltd.

Erection of a two-storey dwelling house upon the site of a stable building known as No. 39a, Odell Street, Old Kent Road, Camberwell, on the application of Messrs. Field, Sons and Glasier, on behalf of Mr. J. Bibbey.

Formation or laying out of three new streets for carriage traffic on the Crofton Park Estate, out of the south-eastern side of Bexhill Road, Lewisham, so far as relates to an alteration in the gradient of Quarry Hill Road, on the application of Mr. J. W. Webb.

Formation or laying out of a new street for carriage traffic to lead out of the north-western side of Denmark Hill, Norwood, on the application of R. Ellis and Son, on behalf of Mr. R. A. Sanders.

Erection of a water-cooling tower at the premises of the South London Electric Supply Corporation, Limited, Bengeworth Road, Norwood, on the application of Balcke and Co., Ltd., on behalf of the South London Electric Supply Corporation, Limited.

Dwelling-houses to be inhabited by persons of the working-class, and proposed to be erected, not abutting upon a street, on a site on the north-western side of Date Street, Walworth, on the application of Messrs. Cluttons.

Erection of an addition to Imperial Court Buildings, Brompton Road and Basil Street, Kensington, whereby such building will exceed in extent 250,000 cubic feet, on the application of Mr. G. D. Martin.

Rebuilding of Nos. 100, 102, and 104, Falmouth Road, Southwark, on the application of Messrs. Colman and Knight.

Trade and Craft.

Vitreous Tiles and Mosaic.

We have received from Messrs. Chance Brothers, and Co., Ltd., glassworks, near Birmingham, some samples of their vitreous tiles and mosaics, which, being manufactured entirely from glass, are therefore very durable, and in fact practically indestructible. The material is of course thoroughly impervious to moisture, and is not affected by acids. Moreover, being of homogeneous material, they cannot possibly craze. They present an extremely agreeable matt surface, which many people may prefer to the high glaze on ordinary tiling; and another pleasant characteristic is a pleasant diversity of the colouring, each specimen being, as it were, "shot" or mottled with harmonious shades of grey, or green, or brown. The units are made in two forms—with mechanically correct edges for close jointing, and with antique rough-cut edges for fixing with open joints. The units are made in various sizes, and in varying forms for angle tiles, skirtings, mouldings, etc. The mosaics are particularly adapted to the decorative treatment of walls and floors, services for which the material seems to be particularly suitable on account of its hardness and non-porosity, as well as by the brightness and permanency of the colouring. Samples can be had on application.

The Excelsior Flooring Cramp.

A patent flooring cramp which should be a boon to builders has been placed upon the market, a mere glance at which suggests at once the power, simplicity, and efficiency of the implement. Well constructed of steel throughout, it will stand the roughest usage without fear of breaking. There are no screw-threads to get out of order, as the cramp works on the ratchet-and-pawl system. The two back pawls work alternately, and thus prevent all possibility of the ram slipping back. It is described by the vendors as an essentially heavy-service tool, easily able to cramp twenty floor boards at one time, if that number were practicable, and at least capable of dealing at one operation with as many boards as can be laid, the boards being closed evenly throughout their entire length. It is quickly and easily fixed, and the workman, in operating it, stands upright over his work. The confidence of the vendors in the complete efficiency of the "Excelsior" flooring cramp is shown in their willingness to take it back in any instance in which it is not approved of. The vendors are Messrs. Shaw, of Wolverhampton.

Insurance.

Free £500 Accident Insurance Coupons have this week been sent to the following:

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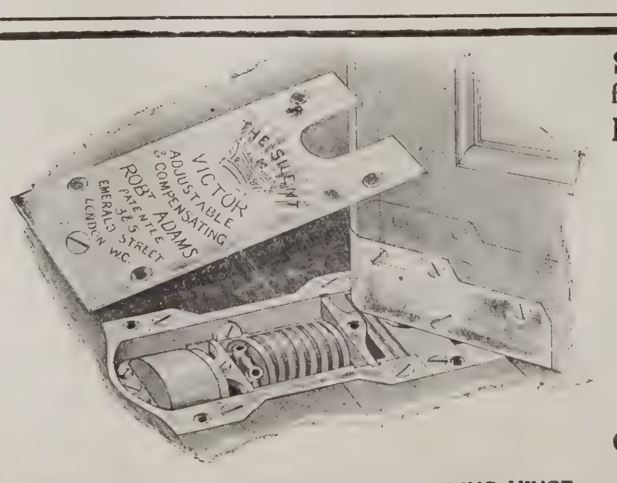

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ADMINISTRATIVE COMMITTEE.

Ex-officio Members:—The President, Vice-Presidents, Hon. Treasurer and Hon. Auditors.

ELECTED MEMBERS.

Northern Centre—T. WILKINSON (Middlesbrough). W. R. THOMPSON (Dewsbury). GEORGE MACFARLANE (Manchester). JAS. STORRS, J.P. (Stalybridge).

Midland Centre—H. WILLCOCK (Wolverhampton). ALBERT S. SMITH (Birmingham).

South-Eastern Centre—WM. SHEPHERD (London). W. F. WALLIS (Maidstone). B. I. GREENWOOD (London). J. BELL, J.P. (Cambridge).

South Western-Centre—Coun. W. N. BLACKBURN (Newport, Mon.). E. J. NEALE (Bristol).

Secretary:
A. G. WHITE, 31 and 32, Bedford Street, Strand, London, W.C.

HALF-YEARLY MEETING AT PORTSMOUTH.

The half-yearly meetings of the National Federation of Building Trades Employers of Great Britain and Ireland were held on Tuesday, July 20th, and Wednesday, July 21st, in the Grand Jury Room of the handsome Town Hall, which had been courteously placed at their disposal by the Mayor and Corporation.

The choice of Portsmouth as the place of meeting was in every respect happy. The Portsmouth Association is one of the most vigorously conducted and flourishing associations in the South, and well deserved the honour implied; and the town, besides being replete with historical interest, and striking, dominantly and persistently, the note of Great Britain's naval supremacy, is by no means destitute of picturesqueness. Portsmouth fascinates by its strongly marked individuality and character, military and nautical; and "Sunny Southsea," which adjoins it, gives a certain degree of relief or relaxation from so much militant strenuousness, affording all the attractions of a delightful holiday resort, and it was here, at the Queen's Hotel, facing the sea, and commanding a magnificent view of the busy Solent and of the wooded undulations of the Isle of Wight that the Federation had its headquarters.

The buildings of Portsmouth naturally received a great deal of attention from the Federation visitors. The Town Hall, where the meetings were held, has been described, without much exaggeration, as a "noble" building. It was built by Messrs. Armitage and Hodgson, of Leeds, to the designs of the late Mr. William Hill, F.R.I.B.A., also of Leeds, and cost more than £140,000. It is of the Corinthian Order, and is built of Portland stone; the portico, supported by six columns, being approached by a magnificent flight of granite steps. The cupola clock tower, rising to a height of 210ft. above the level of the road, is perhaps rather too elaborately decorated, but the fussy detail is lost at the great distances from which the tower can be seen. In the tympanum of the pediment, Britannia is shown surrounded by the figures symbolical of Peace and Plenty, but hardly significant of the genius of the town, which is nothing if not warlike, as the battleships off Spithead, and the grand old "Victory" in the harbour, perhaps sufficiently testify. Inside, occupying the main floor, a vast assembly hall is surrounded by galleries and by wide corridors off which are the various rooms for council committees, etc.; the ground floor being devoted to the municipal offices. The hall is 128ft. by 60ft. by 70ft. from floor to ceiling. There are seats for 2,000, but the hall will hold 3,000 persons. Dominating it is one of the largest organs in the kingdom. This instrument cost £3,500. The work of building occupied nearly four years, and the hall was opened on August 9th, 1890, by the then Prince of Wales, who is now King Edward VII.

Rather too close to the Town Hall—which, however, has an unusually spacious area in front of it, and a park on its north-east side —is the Municipal College, which cost £110,000 to build, covers a total ground space of about 90,000 sq. ft., and has a tower 140ft. high. This building also was built by Messrs. Armitage and Hodgson, of Leeds, the architect being Mr. G. E. Smith, of Southsea. It has a steel-framed roof, floors of steel joists and concrete, and granolithic staircases. It was opened in 1908. There are, of course, many other buildings of interest. There is the usual Carnegie library, and there are some others; and the town is naturally rich in banks and barracks, each after its own kind providing the sinews of war. Passing mention may be made to the sturdy old parish church (Transitional), the Roman Catholic Cathedral with its fine rose window; the George Hotel, which was the last house on English soil in which Nelson slept; the house where, in 1628, the Duke of Buckingham was slain by Felton; and the unpretentious dwelling whose red-tiled roof sheltered the infant head of Charles Dickens, who was born there, as some blatant lettering tells, on February 7th, 1812.

The Council meeting of the Federation, held on Tuesday, July 20th, at 2.30 p.m., was attended by about 34 members, Mr. Ernest J. Brown, President of the National Federation, in the chair. The proceedings, of course, cannot be here published.

The half-yearly general meeting was held in the same room on Wednesday, July 21st, at 10.30 a.m., Mr. Ernest Brown again presiding. In honour of the expected presence of the Mayor, the President wore his chain of office. The Mayor, however, did not arrive in time to give his address of welcome before the business began.

The notice calling the meeting, and the minutes of the last annual meeting, held at the Trocadero, Piccadilly, London, on January 27th, 1909, having been taken as read, the latter, on the motion of Mr. James Wright (Nottingham), honorary treasurer, seconded by Mr. W. Wistance (Walsall), being confirmed, and its circulation authorised.

The next item on the agenda referred to the welcome that the Federation was prepared to offer to Mr. W. R. Poynton, hon. life President of the National Federation of Building Trade Employers in South Africa, who, however, being in this country for the benefit of his health, was forbidden by his medical adviser to undertake the journey from London to Portsmouth. The secretary read a letter to that effect from Mr. Poynton, who, it appeared, had been led to suggest the formation of the South African Federation through having attended one of the congresses of the National [British] Federation held five years ago. The secretary stated that he had had an interview with Mr. Poynton, who had expressed a cordial desire for some form of affiliation, or some bond of union between the two Federations.

He said that in conversation with Mr. Poynton the latter had suggested to make subscription to the official journal a passport to affiliation.

The President said that he was sure the meeting would have extended a most hearty welcome to Mr. Poynton, the cause of whose absence all present greatly regretted; they would all wish him a speedy return to health. It was very gratifying to find that the South African Federation had thought us worthy of imitation. He (the President) saw no objection to the suggestion. In giving it effect, the details might be left to the Administrative Committee.

Mr. Davidson thought that there was a possibility of forming a dangerous precedent.

The President, however, said that the action bound the Federation to nothing beyond a reciprocation of the sympathy and goodwill that had been expressed towards us. It was simply a matter of "hands across the sea."

It was agreed to refer the matter to the Administrative Committee with power to act.

At this point the Mayor of Portsmouth (Councillar J. Biggs, J.P.) arrived. He apologised for being late, explaining that he had mistaken the time of the meeting. In offering the National Federation a very hearty welcome to Portsmouth, he said that this town, like most others, ought to be very grateful to the much-abused speculative builder, to whose courage and enterprise a vast amount of building improvement was due. To this influence he attributed much of the rapid and enormous expansion of Portsmouth, where, within thirty years, remarkable improvements had been accomplished, and there had been an immense increase in the population, which now numbers about 210,000. The Town Hall, and most of the more important buildings, had been put up within the past seventeen years. Since builders had played so important a part in the expansion of Portsmouth, he was glad to offer their acredited representatives a hearty welcome to the town, and to receive them in the Town Hall, a building of which, as builders could readily understand, the people of Portsmouth were very proud.

The President replied in a graceful and humorous speech, in which he made a sly allusion to a stormy scene that had occurred on the previous day at a meeting over which the Mayor had presided, but offered his worship a solemn assurance that the builders, although by no means deficient in the fighting spirit in which Portsmouth seemed to abound, always conducted their deliberations with the utmost seemliness and decorum.

The Mayor having retired, the sixty-second half-yearly report was, on the motion of Mr. James Wright and Mr. Wistance, taken as read. The chief points are here given:—

State of Trade.—No general improvement of the building trade can yet be reported. In some parts is it worse than a year ago.

Conciliation Boards.—The National Board has held two meetings during the past half-year. The cases considered were:—Appeal of carpenters and joiners of Swansea: decision given, "That the wages of Swansea carpenters and joiners remain as at present, and that the hours of labour be those proposed by the operatives' notice." Appeal of the employers of stonemasons of Manchester: No decision on the question at issue, viz., a reduction of wages and alteration of hours, was given by the Board, but the parties were recommended to refer the matter to a Board of Trade arbitrator.

The following amendments to the rules having been duly notified were passed at the annual meeting of the National Board on May 25th, 1909, and are now operative. Rule 2—Lines 20 to 24:—To add the portion underlined to provide for dealing with employers from another town:—"If, however, the principal place of business of the contractor is not situate within the district covered by the local conciliation board, or should a dispute arise on a job of an employer outside his own town or district, then it shall be competent for him to demand, etc., etc. Period for which a decision shall endure: That it shall be the duty of every Board of Conciliation when giving a decision to take into consideration the desirability of stating a minimum period for which such a decision is to endure. Private consultation at board meetings: That should either side desire to retire for private consultation during the sitting of any of the Boards after hearing the evidence, they shall be allowed to do so.

THE TOWN HALL, PORTSMOUTH, WHERE THE NATIONAL FEDERATION MEETING WAS HELD.

Application of builders' labourers for admission to conciliation scheme: The resolutions of the National Federation in regard to the admission of builders' labourers to partial participation in the scheme were considered at the annual meeting of the Board on May 25th, 1909, and accepted, and an intimation has been sent to the builders' labourers that they may participate on these conditions. The resolutions referred to are:—"That this Federation recommend that the application of the builders' labourers for admission as parties to the National Scheme of Conciliation be not acceded to, but that builders' labourers be allowed to join Local Conciliation Boards where the employers and skilled operatives are in favour of such a course, provided that the agreement under which they are so admitted shall clearly state that their admission is purely optional and not of right, and shall further provide that no labourer representatives shall sit on the Centre or National Boards to adjudicate on cases from towns where the labourers' union or unions do not receive recognition, and shall only sit on local boards when matters affecting their interests are concerned." "That where a labourers' union is admitted into the Local Conciliation Board of any district and a dispute arises which the local board cannot settle, a joint application by the parties concerned for their case to be heard by the Centre and National Boards shall be granted, provided both applicants agree to accept the decision of either of these Boards, and to pay all expenses of the hearing or hearings." Suggestions for further amending the rule as to quorum and for a new rule as to notice of alteration of local rules where a case is sub-judice by the Conciliation Boards were approved, and are recommended to the parties to the scheme for further consideration.

The recommendation of the Board to the parties at Southampton to refer the dispute to an arbitrator has been acted upon, and the dispute has been referred to the decision of Mr. A. A. Hudson, of the Board of Trade.

Satisfactory reports as to the working of these Boards have been received from the Midland Centre which says: "The past year has not been quite so free from disputes in the Midland Centre area as in the previous 12 months. Fortunately the difficulties have not been serious, and their settlement had proved conclusively the value of the various Conciliation Boards."

The National reserve fund continues to make satisfactory progress, a considerable amount of arrears have been received, and a further £500 has been invested in India 3½ per cent. stock of the value of £502 19s. 5d.

Third Annual Return of Membership: With a view of collecting statistical information likely to be useful to the Federation generally, the Adminstrative Committee again issued forms requesting a return of the number of members in the respective associations, and also the number of men and apprentices employed in the various trades for a week in June, 1909. The forms have been simplified and so arranged that members may make their returns under a reference number without appending any signature. It is hoped that the greater privacy so secured will induce all members to assist in making these returns as complete as possible.

Fair Wages Clauses in Contracts: Two typical clauses have been drafted to serve as models, and having been approved by the Administrative Committtee, are now available for the use of the membership.

The N.A.O.P. Agreement: The Joint Committee, under the above-named agreement, after careful consideration, has drafted a revised agreement of a more comprehensive character, especially in regard to clause 5, which has been redrafted. A new clause has been added authorising the adoption of regulations governing procedure on similar lines to those adopted by the Conciliation Board. The revised agreement and regulations have been formally approved, and recommended to the parties to the agreement for ratification.

Smithies v. N.A.O.P.: It is reported that the costs in this action are now being taxed, but as yet it is not possible to ascertain what the financial outcome will be.

Prevention of Accidents in the Building Trade: The Building and Engineering Works Bill, a Government measure to amend the Factory Acts, by extending certain provisions thereof to enable scaffolding, etc., regulations to be applied to the building trade, has been re-introduced this session.

Form of Contract: An agreement has been arrived at between the R.I.B.A. and the Builders' Institute as to the terms of the proposed amendment to clause 30, and the consent of this Federation is now desired thereto.

Conditions of Contract and Conditions in Quantities: The attention of the R.I.B.A. and of the Quantity Surveyors' Association has been drawn to what appears to be a growing practice of stating at the beginning of bills of quantities that the conditions of contract will be those agreed between the R.I.B.A. and the Builders' Institute, the while subsequent conditions are inserted in the quantities which vary the said agreed conditions of contract. As those subsequent conditions are probably repeated in the specification, there is danger that a confusion will arise which would make it extremely difficult to say what are the exact terms of the contract between the parties. The Quantity Surveyors' Association in reply say they cannot understand how the inconsistency of which complaint is made can possibly arise when the quantities are prepared by a reliable surveyor. They express themselves quite in accord with us in deprecating such a practice, and will use their influence wherever practicable with a view to effecting its discontinuance. The R.I.B.A. has published the communication in its journal for the information of members.

Checkweighing Bill: The attention of the County Federation has been called to the above Bill, which may affect quarry owners, with a request for any observations they may desire to make thereon.

Comparative Statement of Wages and Hours: Particulars of wages and hours in the federated towns have been collected and published in the "Builders' Journal." It is hoped the new arrangement of the towns by Federations and in groups of over and under 100,000 inhabitants will be found useful to members in negotiating wages agreements, and lead to something like a uniform level of wages in the respective classes for given areas.

Finance Bill: The attention of the County Federations was called to this Bill. The response was very small, and on the matter being brought before the Administrative Committee it was decided not to take any action.

Home Office Departmental Committee on Lead Poisoning: On May 17th a communication was received from the Home Office saying that it was proposed to appoint a Departmental Committee to consider the question of lead poisoning in the painting and plumbing trades. The Federation was requested to communicate with the bodies concerned, and the London Association appointed their President, Mr. F. G. Rice, the National Painters' Association their secretary, Mr. W. G. Sutherland, of Manchester, and after consideration of the names suggested by our County Federations, the President selected Mr. J. W. Bellamy, of Birmingham to represent this Federation. These names with addresses have been duly forwarded to the Home Office. As the operatives concerned will bring forward evidence tending to show the necessity for restrictions and regulations relating to the use of poisonous paints, the employers will have to be prepared with rebutting evidence or their case may suffer, it would be well, therefore, for the County Federations and local associations to be inquiring as to suitable witnesses in readiness.

Government Departments and Tendering Without Quantities: Particulars having been supplied of two cases in which the War Office and the Post Office had called for tenders for jobs of considerable size without supplying quantities, a letter was sent to the heads of those departments calling attention to the cases and requesting that in future quantities should be supplied for works of, say, £500 and upwards. A reply has been received from both departments saying that in future as far as practicable they will supply quantities for works likely to exceed £500.

[References to the action taken with respect to the Trade Disputes Bill, the Trade Boards Bill, and to the Housing and Town Planning Bill, are made in the report, but, having been already dealt with in the journal, are not here repeated.]

Official Journal: Various circulars have been issued by the Journal Committee with the object of eliciting increased support from the membership. Several associations have arranged for every member to receive the journal, and amended the subscription rate to cover it, with entirely satisfactory results, and others are promising to follow suite. This is the true way to make a big success of our official journal, and should be largely imitated.

Annual Conference of Secretaries: Reports of the 1908 Conference have been distributed. The 1909 Conference will be held at Leeds on or about October 20th. The committee is very desirous that every local secretary should be sent by his association to take part in these conferences, which are of great educational value, and have led to very satisfactory developments of organisation in certain localities in consequence of the suggestions and encouragement which those attending have received. It is understood that considerations of expense keep back many from attending, and it is therefore very desirable that the local association councils should take steps to remove any hindrance of this kind.

Protection of Members: The case from York, referred to in last report, has resulted in a withdrawal of claim against our member, and the York Association has thanked the Federation for the assistance rendered.

Court of Arbitration. As a result of the communication sent to the President of the Board of Trade through the Employers' Parliamentary Council, as mentioned in last report, the following reply has been elicited:—"The Board of Trade have endeavoured to obtain the services of well-known and representative employers, and at present not those of representatives of particular industries. The Board considers that these representative employers would fully appreciate the interests of the employers' side in any dispute, and in cases in which they are not familiar with the technical details of the industry affected, they have power to appoint technical advisers to advise them. Should, however, the parties to a dispute request the Board to appoint a court including employers and workpeople from their own industry, the Board would give the request their most favourable consideration."

Priced Schedules with Tenders: As a result of inquiries addressed to the various branches of the Federation as to the extent of the practice of demanding priced schedules with tenders, it appears to be generally confined to engineers or other officials representing certain railway companies and public bodies; there appears, however, to be a tendency for architects to imitate them in some places, and it seems desirable that some general policy should be decided upon and adopted by the Federation in regard to this question.

The Proposed International Federation for the Building Trade: In accordance with instructions of the Committee, the secretary attended a meeting in Brussels of the Committee charged with drawing up a constitution for the proposed Federation. Delegates also attended from Belgium, Holland, Italy, Hungary, and France. The secretary secured the assent of the Committee on two points which appear to be of primary importance for the success of the contemplated Federation; one, that the annual subscription should be fixed for the present at 10 centimes (or approximately 1d.) per member, the second, that in future International Congresses other languages than French should also be recognised and interpreters provided so that delegates might address the congress in one of the four principal European languages. For the Executive Council, however, French would still be used.

Belgian Builders' League: On April 24th and 25th, the above League celebrated the 25th anniversary of its foundation, and as the event coincided with the meeting of the Committee just referred to, its members were invited to assist at the celebration.

The employers at Colwyn Bay are endeavouring to form an association, and every assistance will be offered them. Several other Lancashire towns have received attention by the organisers, including St. Helens and Wallasey, but there is nothing further of a definite nature to report at present. The Committee regret to state, however, that owing to the state of trade, and no doubt other reasons, great apathy is shown in the smaller towns with regard to organisation, and the difficulties in the way of extending the membership are very great indeed. A conference of secretaries of the district was held on January 22nd last, with satisfactory results; it has been decided to hold such meetings half-yearly in future.

With regard to the paragraphs in the report dealing with the application of labourers for admission to the conciliation scheme, a remark by Mr. Davidson as to the attitude of the Yorkshire associations on this question gave rise to a short conversation, which the secretary summed up with a remark to the effect that it is advisable for local associations to accord this privilege only where rules exist and have been agreed upon between themselves and the labourers.

National Form of Contract.

On the motion of Mr. F. L. Dove, L.C.C. (London), seconded by Mr. F. Higgs (London), it was agreed to assent to the following amendment of clause 30 of the National Form of Contract:—

PRESENT WORDING.	AMENDED WORDING.
"No certificate of the Architect shall be considered evidence as to the sufficiency of any work or materials to which it relates, nor shall it relieve the Contractor from his liability to make good all defects as provided by this agreement."	"No certificate of the Architect shall of itself be considered conclusive evidence as to the sufficiency of any work or materials to which it relates so as to relieve the Contractor from his liability to execute the works in all respects in accordance with the terms and upon and subject to the conditions of this agreement or from his liability to make good all defects as provided thereby."

In discussing this proposal, to which the legal advisers of the R.I.B.A., and the Builders' Institute had agreed, and to which the assent of the National Federation was sought by the Builders' Institute, Mr. W. H. Hope (Sunderland) said he had no doubt that the amendment had been suggested in consequence of a decision that had been given by Lord Justice Farwell. Mr. Hope thought the alteration superfluous, because the decision on appeal showed that as a matter of fact, there is no item in a contract, or dispute that can arise with respect to it, that cannot be taken to arbitration. On the other hand, the alteration might possibly turn out to be troublesome, as circumstances might conceivably arise in which it might be necessary to go to court in order to determine the meaning of the clause. However, he would make no motion on the subject.

The Official Journal.

Mr. George Macfarlane (Manchester), hon. vice-president, moved the following recommendation of the Administrative Committee:—"That it be a recommendation to local associations that every member be supplied with a copy of the journal, and that the cost thereof be added to his subscription on the lines adopted at Sunderland, viz., 5s. additional subscription payable by each member, and the balance of cost paid out of the funds of the local association." Mr. Macfarlane said there could be no question that the official organ of the Federation ought to be received and read by every member of every association, and he was glad to know that certain associations had already adopted the sensible practice of buying the journal wholesale and distributing the copies among their members. He pointed out that the journal was now giving Federation news in every issue, instead of only once a month as heretofore, and he urged secretaries to avail themselves as freely as possible of the improved facilities.

Mr. A. S. Smith (Birmingham) thought that association secretaries might do much to assist in making the journal useful and interesting to members.

The President urged secretaries to preach the gospel of the "Builders' Journal" as a strong power in the land, the accredited organ of a large and an influential organisation. In particular he advised all associations to adopt the very sensible course that had been already put into practice by many of printing on their stationery and note headings a line announcing that the "Builders' Journal" is the official organ of the National Federation.

Mr. F. W. Amphlet (Birmingham) observed that the suggestion as to mentioning the journal on association note-headings had been willingly adopted in the Midlands.

Mr. Percy Hastings, invited by the President to address the meeting, said that there were a few secretaries who as yet did not seem quite fully aware of the tremendous power that the journal can be to them if they make proper use of it. He had no desire to boast, but he could not help being aware that there were certain respects in which the journal was unequalled by any organ in the trade Press. He concluded by offering some practical advice as to ways in which secretaries could more fully avail themselves of the immense advantages accruing from the support of a powerful and up-to-date trade organ such as the "Builders' Journal."

Mr. Hasting's remarks were very cordially received, and it was unanimously resolved to adopt the report and to recommend it to the careful consideration of County Federations and local associations.

Revised N.A.O.P. Agreement.

This matter was also considered, and will be dealt with in a future issue of the Journal.

Priced Schedules with Quantities.

Mr. James Wright introduced a recommendation by the Administrative Committee that, as amended in the course of the debate, reads as follows: "That each Federation and local association should, as a matter of principle, instruct their members to refrain from sending in priced schedules with tenders, but if not able to avoid doing so should endeavour to arrange locally with engineers, surveyors, and architects, who at present insist upon having priced schedules with tenders, that such schedules should be delivered under seal, and that the schedule of the accepted tender only should be opened, and the others returned to the unsuccessful contractors." Mr. Wright stated that inquiries by the secretary as to the extent to which the practice prevailed of insisting on priced schedules showed that railways, corporations, and architects, acting under education committees, appeared to be increasingly addicted to it; and he hoped that, since most builders found it objectionable, every effort would be made to break it down.

Mr. Stirling, in supporting the resolution, said that although the matter had been before the Federation for a good many years, the bad practice was apparently increasing. He suggested that better progress might be made if the Institute of Civil Engineers and the R.I.B.A. were approached on the subject.

Mr. Easten thought that each Federation and local association should, as a matter of principle, request members to refrain from tendering under such conditions.

Mr. Davidson thought that it should be emphatically recorded that the Federation wishes to abolish this bad custom.

The resolution was recommended to the county Federations and local associations for consideration and adoption as far as practicable.

Proposed Builders' Bureau.

A proposal to appoint a provisional advisory committee of builders to co-operate with certain Bureau officials with a view to the organisation of a builders' bureau was introduced by Mr. Smethurst. In the ensuing discussion, in whch Mr. J. W. White, Mr. Stirling, and Mr. Blackburn took part, the prevailing opinion was expressed that any such organisations (of which the utility was doubted) should be entirely in the hands of the builders themselves, and the resolution was lost.

Next Annual Meeting.

It was decided that the next half-yearly meeting should be held in London.

Festivities.

At the conclusion of the business, the members of the Federation were entertained at luncheon by the Portsmouth and District Master Builders' and Building Trades Association (President, Mr. G. J. Davis; vice-presidents, Messrs. J. Harding, and A. E. Porter, T.C.; treasurer, Mr. James Cockerell; secretary, Mr. Frank B. Roskell). The toast-list was as follows:—"The King and Royal Family," proposed by the President (Mr. G. J. Davis); "The Mayor and Corporation," proposed by Mr. S. Smethurst, senior, vice-president of the National Federation, response by the Mayor (Councillor J. Baggs, J.P.); "The National Federation of Building Trade Employers," proposed by Mr. J. W. Perkins, T.C., response by Mr. Ernest J. Brown; "Portsmouth and District Master Builders' and Building Trades' Association," proposed by Mr. E. J. Brown, response by Mr. G. J. Davis.

After the luncheon, members were conveyed to the Dockyard, where (by special permission of the Commander-in-Chief), they were shown over the Vernon Torpedo Depot.

The weather throughout the meeting remained consistently fine, and all the conditions (except perhaps the firing of ordnance in the dead of night), combined to render the Federation's Portsmouth visit very pleasantly memorable.

General Federation News.

OLDHAM AND DISTRICT ASSOCIATION.
Secretaries: Cowper and Dean.

The half-yearly general meeting of Oldham and District Master Builders' Association was held at the Cafe Monico, Union Street, Oldham, on Friday evening, July 9th, Mr. S. Smethurst (president) in the chair.

The report for the half-year ending June 30th, 1909, was approved and adopted.

Arising out of the report, Mr. Heywood asked the amount of fine imposed in the case of the breach of inter-trading rule particularly referred to in the report, and on being informed that the amount was £3 3s., suggested that the expression "heavily fined" was misleading, and in proportion to the amount of the work involved was very small. It was pointed out that the expression was used because the fine was heavier than had been previously enforced in any case.

The secretary having explained that rule 6 provided for only four vice-presidents, while at present there were five, it was resolved that the rule be altered so as to provide for the election of six vice-presidents.

The question of there being no arbitration clause in the fair contracts clause adopted by the Oldham Corporation was fully discussed, and it was resolved that a letter be sent to the town clerk stating that the members in general meeting consider that at least a provision should be made that in the event of the Corporation deciding to impose a penalty or cancel a contract under the clause, the contractor should have the right to appeal against the decision to an independent arbitrator. It was further decided to leave the matter in the hands of the Executive Committee.

The question of arbitrary conditions which had been inserted in bills of quantities and contracts during the six months was then considered. The secretary reported that several complaints as to these arbitrary conditions had come to hand from members, and more particularly with regard to prolonged maintenance clauses. After discussion, it was resolved that the Executive Committee be asked to deal further with the matter, and call the attention of architects to the growing practice of inserting these arbitrary conditions in bills of quantities as well as in contracts.

The question of the long delay in squaring up and closing jobs by architects was brought forward by Mr. Butterworth, and after a long discussion the President pointed out that the best way of dealing with these matters was to make it compulsory upon members to sign only the form of contract approved by the R.I.B.A., Institute of Builders, and National Federation, and it was a question of altering the present rule 16a, making the use of the forms referred to compulsory instead of voluntary. Mr. Rose promised to give notice of motion for alteration of rule 16a at the annual general meeting, and in the meantime it was resolved that the Executive Committee take up this question with the architects.

The question of direct tendering was also brought forward by Mr. Horrobin; but as the President stated that the hour was late to commence discussing this big question, it was decided to bring same forward at the next general meeting, and also in committee.

The question of fixing a probationary period during which firms or individuals should be in business as employers before becoming full members of the association was then brought forward by Mr. Rose and Mr. Brooks, and after some discussion it was pointed out that notice of motion for alteration of rule 3 should be given before this could be dealt with, so as to give all members a full opportunity of considering the

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matter before dealing with same. The president promised that it should have the consideration of the Executive Committee in the meantime.

Oldham and District Association's Half-Yearly Report.

In the report for the half-year ending June 30th, it is stated that six new members have been secured during the half-year, and none have been struck off the books. The number of members now on the books is 187. The association is, therefore, one of the largest connected with the L.C. and N.W. Federation. Financially, everything is in a satisfactory condition, and the local reserve fund has been increased. The entrance fee is now increased to £2 2s. Members who have paid their subscriptions to date are supplied with a Federation Year Book, containing list of members and local employers' and operatives' rules, together with the Federation report, and other valuable information.

During the half-year the employers' representatives in the joiners' branch have dealt with the question of reduction in wages of the operative joiners from 9½d. per hour to 9d. The demand was refused by the operatives, and the matter has been dealt with at two sittings of the Local Conciliation Board, but on being voted on by ballot resulted in equal voting, and the case was then referred to the Northern Centre Conciliation Board. The representatives attended with the case before the Board at Leeds, and, after going fully into the evidence, the voting resulted again in a tie, and no decision could be given. The employers are now considering the question of appealing to the National Conciliation Board, to be held in London. All immediately surrounding districts are paying less wages than in Oldham. In dealing with this case numerous meetings referred to below were held, and the ramifications of the Builders' Associations and Federations have been realized by the operatives, and appreciated by the employers, and the Local and Centre Conciliation Boards have served a useful purpose in such dispute.

The Executive Committee have dealt with several architects and proprietors regarding inviting tenders from members in competition without supplying quantities in contravention of the rule on the subject. A special circular has just been sent out to all members, requesting unqualified adherence to the rule. The matter will be brought before the members for discussion.

A sub-committee was appointed some time ago to deal with the suggested new Fair Contracts' Clause and the proposed new Improvement Bill, and deputations have appeared on two occasions before the Finance Committee of the Oldham Corporation regarding the matter. Much correspondence has ensued, and the committee have endeavoured to carry out the instructions of the members to resist the new clauses to the full extent. The result has been the removal of objectionable features in two or three clauses, but the maximum penalty of £500 remains, and without arbitration clause, the Corporation having sole right to fix a penalty for an alleged breach of the clauses. The committee have decided to ask the Corporation to consider the question of providing for an appeal against an adverse decision.

The intertrading rule has attained the desired object of increasing the membership to such an extent that the effect is not felt to be any hardship, and firms, who, in the event of a strike or lock-out through being outside the Association, might have proved a stumbling block to an effective settlement, now appreciate and obtain the advantage of the intertrading rule, and are prepared to work harmoniously along with old members. As all the principal firms in the building trade are now members of this association, intertrading can be carried on without difficulty. The National Federation recommend all associations to adopt this rule, and full reasons for its adoption can be supplied on application.

It has already been reported that the National Federation are endeavouring to raise £10,000 as a reserve fund by voluntary contributions, and have allocated the collection of certain amounts to the various centres and County Federations. The L.C. and N.W. Federation have decided to raise a reserve fund of £3,000 of their own first, and have also decided to contribute £1,600 in four yearly instalments towards the "National Fund" out of same, if possible. Your committee some three years ago decided to ask for support from members towards the L.C. and N.W. Fund by raising a minimum sum of £300 in Oldham, subject to a proportion being handed over to the "National Fund." The subscriptions by local members to date amount to £286, and there are further promises of £4 11s. 6d. still outstanding, but only a small proportion of members have yet subscribed. Only £14 is now wanted to make up the amount required, and Oldham will then have contributed liberally to the fund, in proportion to its strength and position.

Attention is called to the growing popularity of THE BUILDERS' JOURNAL as the official organ of the National Federation, and to the fact that it contains every week reports of the most important transactions of the various Federations and Associations.

The attention of members is again called to the fact that next year the Association attains its majority.

Midland Centre.

The half-yearly meetings of the Midland Centre were held at the Dartmouth Hotel, West Bromwich, on Thursday, July 15th. The Executive Council met in the morning, and were subsequently entertained at lunch by the president and members of the West Bromwich M.B.A.

At the meeting of members in the afternoon, the President (Councillor H. Smith) took the chair, and there was a fair and representative attendance.

The secretary was instructed to attend the half-yearly meeting of the National Federation at Portsmouth the following week.

The Secretary reported that, as a result of inquiries, it did not appear that the practice of asking for priced quantities with tenders existed to any large extent in the Midlands. The exceptions were the Derby County Education Committee, H.M. Office of Works, and the railway companies. The meeting approved the resolution on this matter to be submitted at the National Federation meeting.

The half-yearly report stated that the building industry still remains in a depressed condition. There had been no serious labour troubles in the centre during the past six months. Two disputes (at Birmingham and West Bromwich) had been settled by the Midland Conciliation Board. Cash in hand on account of Midland Centre Reserve Fund, £55 13s.; National Reserve Fund, £26 11s. Mr. F. H. Fish had been appointed on the National Council, in place of Mr. J. Wright, who was now an *ex-officio* member. Reference was made to the third conference of the Midland Centre secretaries, and to the annual meeting of the Midland Centre Conciliation Board. The Council believed that the successful working of the Board had been largely due to the ability and interest which the retiring chairman (Mr. J. B. Whitehouse) had devoted to the office. The Collective Insurance Scheme with the Law, Car and General Insurance Corporation, Ltd., had been renewed for another twelve months on the same terms and conditions as last year. Reference was made to the comparative statement of hours and wages in THE BUILDERS' JOURNAL, and the local secretaries were requested to cooperate in making the statement as full and accurate as possible. All arrears of subscription for last year were now paid, with the exception of one item. Although few subscriptions had been paid for this year, the balance in hand was £48 9s. 2d.

The report and financial statement were approved and adopted.

The revised agreement with the N.A.O.P. was approved.

A letter was read from the Mayor of West Bromwich (Councillor Joseph Lawley) ex-

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pressing his regret that he had been unable to meet the Executive Council at lunch or the members at the tea which was provided at the close of the meeting.—F. W. Amphlet, Secretary.

BURTON-ON-TRENT ASSOCIATION.

Secretary: A. W. Chamberlain.

A general meeting of the Burton-on-Trent and District Building Trade Employers' Association was held at the Station Hotel, on Wednesday, July 14th, Alderman J. E. Lowe, J.P., in the chair.

The secretary was instructed to attend the half-yearly meeting of the Midland Centre at West Bromwich, and the National Conference of Secretaries at Leeds in October. The Secretary reported that there was still a considerable number of members who had not sent in their employment returns, and it was resolved that a further appeal be made to them to do so.

The fair wages clauses, as submitted by the National Federation, were considered, and the Secretary was instructed to bring same up for further discussion.

The draft agreement of the N.A.O.P. was considered, and it was resolved that the Secretary bring same before the local master plasterers and report.

Burton-on-Trent Conciliation Board.

The annual meeting of the Burton-on-Trent Building Trades' Conciliation Board was held at the Station Hotel on Wednesday, July 14th, 1909. There were present on behalf of the employers: Alderman T. E. Lowe, J.P., in the chair; Councillor Kennard; and Messrs. H. B. E. Edwards, I. M. Harlow, Wm. Wood, G. Cavigan, and A. W. Chamberlain, secretary. On behalf of the operatives, Mr. Jos. Dent, and G. Brimley. The following gentlemen were appointed officers for the ensuing year: Chairman, Alderman T. E. Lowe, J.P.; vice-chairman, Mr. Joseph Dent; employers' secretary, Mr. A. W. Chamberlain; operatives' secretary, Mr. Geo. Brimley.

Alderman Lowe (chairman) remarked that the Board were exceedingly sorry to hear that the late operatives' secretary, Mr. Fred Jones, was retiring from the Board. He (the chairman) had known Mr. Jones from his own first experience of conciliation work, and had always found him to be very just in all his dealings. Alderman Lowe took this opportunity of proposing that a very hearty vote of thanks be accorded to Mr. Jones for the very useful work he has done in connection with this Board. The resolution was seconded by Mr. Chamberlain (joint secretary), supported by Mr. Dent, the vice-chairman, and on being put to the meeting was carried with acclammation.

The usual yearly balance-sheet was passed as read.—A. W. Chamberlain, employers' secretary.

BRISTOL ASSOCIATION.

Secretary: A. J. Pitt.

A meeting was held recently between representatives of the Bristol Association and of the operative societies, for the purpose of forming a local conciliation board under the national conciliation rules, and supplementary to the conciliation rule contained in the local working rules.

Mr. Frank N. Cowlin (President of the Association), was elected chairman of the board, and in taking the chair said it was very gratifying, not only to himself, but to the members of the association generally, to look back upon the amicable relationship which had existed for so many years past between masters and men. He trusted that that record would continue unbroken for many years to come.

Ald. J. Curle, J.P., was elected vice-chairman, and Mr. A. J. Pitt and Mr. G. H. Voisey were elected joint secretaries, representing the employers and the operatives respectively.

The question of stating a time when tendering for work in competition has lately occupied the attention of the Association, and received consideration at the recent monthly meeting.

The Bristol Association have a rule that, except under special circumstances, members shall not state a time when tendering for work in competition, and considerable discussion has taken place as to the advisability of abandoning the rule. Enquiries proved that Bristol apparently stands alone as regards this rule, but several members contended that it was quite enough to meet in competition in respect to price, without an additional competition on time, and this view was supported by a majority of the meeting, and it was decided to allow the rule to stand as at present. It was pointed out that the obvious way out of the difficulty would be for the architect, when calling for tenders, to state the time in which the work must be completed, and a suggestion was made that it would be well to arrange, if possible, a conference with the architects at which this, and other points of interest, might be advantageously discussed. The matter was left in the hands of the President to deal with as he considered best.

The President submitted to the meeting a schedule received from the Bristol Chamber of Commerce in reference to the possibility of increased traffic in building materials between Bristol and the Midlands, in the event of increased facilities being obtained in the canal system between those districts, and upon which question a Royal Commission was now engaged. He pointed out the very great advantages to Bristol trade which would result from direct and rapid water communication to the Midlands, and also showed that such facilities would undoubtedly effect a considerable saving in carriage on tiles, sanitary ware, ironwork, and other building materials which came from that district; and upon his proposition it was decided to fill in the return as to the probable amount of traffic which members would bring over the route, and to support the efforts of the Chamber of Commerce in the compilation and submission to the Royal Commission of a complete and satisfactory statement of the existing traffic, and an estimate of the possible prospective increase which would be likely to arise out of improved conditions and facilities.

Mr. E. J. Neale desired that members not already subscribers to the "Builders' Journal" should be circularised, drawing their attention to the publication and the desirability of giving it hearty support.

Mr. Neale also gave a very interesting resumé of the business transacted at the recent meeting of the Federation in London, dealing particularly with those matters which had received consideration by the local association from time to time.

It was resolved that the annual summer excursion of the Association should this year be still another trip to the river Thames, visiting Henley and Cookham, thus joining up the two portions of the river already visited. Details were left in the hands of a sub-committee.

LEEDS ASSOCIATION.

Secretary: J. Davidson.

The monthly meeting of the Leeds Association was held on July 13th, Mr. Irwin (president) in the chair. It was decided to send to the press a copy of the letter forwarded to the town clerk of Leeds with respect to back-to-back houses.

In regard to the request which has been made to the Leeds Education Committee to inspect the tenders for school repairs which were recently accepted, a letter was read from the secretary to the committee stating that the tenders were confidential communications, and the committee could not see their way to grant facilities for inspection.

Messrs. J. H. Tomlinson and G. W. Wilson were appointed to represent the association at the National half-yearly meetings at Portsmouth.

The draft sub-contract form referred to the associations for consideration by the Yorkshire Federation was carefully considered. Attention was drawn to several features which it was thought needed amendment, and it was decided to leave the further consideration of the form until the next meeting.

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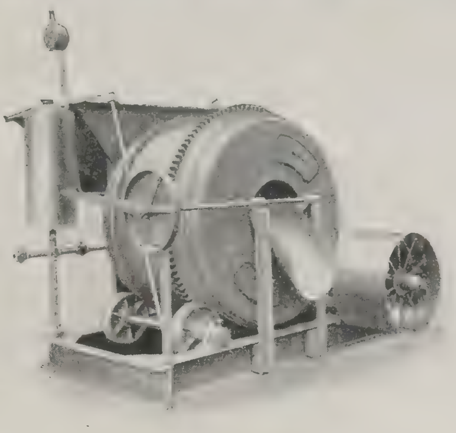

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Owing to the August Bank Holiday "THE BUILDERS' JOURNAL" for August 4th will close for press on Friday, July 30th. Advertisements for this issue and alterations to Serial Advertisements must reach us by first post on that day. Small Advertisements can be received up till 5 o'clock.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Aberavon.—For alterations to Wern Congregational Chapel, Aberavon, and erection of new school-rooms, etc. Messrs. Evans and Jones, Station Road, Port Talbot, Architects.

S. T. Rees	£1,950	0	0
D. Davies and Sons, Trade Street, Cardiff	1,775	0	0
Price Bros., Pontcanna Road, Cardiff	1,742	10	0
J. Nicholas, Saw Mills, Port Talbot	1,719	0	0
F. W. Foley, Water Street	1,634	0	0
W. H. Evans, West Luton Place, Cardiff	1,610	0	0
W. Williams, Pearl Street, Cardiff	1,590	0	0
Anderson and Vaughan, Albion Works	1,580	12	10
J. Davies,* Saw Mills	1,533	9	5

Rest of Aberavon.

*Accepted.

Birmingham.—For digger, concrete, and builder work, for new workshops for Messrs. James Booth and Co., Ltd., Argyle Street, Nechells, Birmingham. Messrs. D. and A. Home Morton, Consulting Engineers, Glasgow and Birmingham.

William Bishop, King's Heath	£1,527
J. Barnsley and Son, Birmingham	1,416
E. Crowder, Birmingham	1,294
C. H. Horton, Brierley Hill	1,205
Geo. Mobbs,* Birmingham	1,187

Engineers' Estimate, £1,200.

*Accepted.

Farnham Common.—Alterations and additions to "Highlands," Farnham Common, Bucks. Mr. J. Wornell, architect, "Trevose," King Edward Street, Slough.

Burfoot and Butler, Slough, £205.

Guildford.—Tenders for house at South Hill, Guildford, for W. R. Philpot, Esq. Messrs. Hodgson and Symmonds, architects, 100, High Street, Guildford, and Haslemere.

For House.

Messrs. Swayne and Son	£845	0	0
Mr. R. Smith	827	0	0
Mr. S. Ellis	815	0	0
Messrs. Higlett and Hammond	795	0	0
Messrs. Tribe and Robinson	780	0	0
Mr. A. Johnson	773	0	0
Messrs. Rutter and Gibson*	690	0	0

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Mr. R. Smith	£36	0	0
Mr. S. Ellis	33	10	0
Messrs. Higlett and Hammond	28	10	0
Messrs. Tribe and Robinson	25	0	0
Mr. A. Johnson	17	10	0
Messrs. Rutter and Gibson*	10	10	0

*Accepted.

Haine, near Ramsgate.—For the necessary alterations and additions required at the receiving block, at the Isle of Thanet Joint Hospital Board, Haine, near Ramsgate. Mr. H. Bertram Langham, Bank Chambers, Broadstairs, Architect.

J. Strand, Margate	£755	0	0
L. Seager, Sittingbourne	719	0	0
J. R. Rattray, Margate	665	6	0
J. W. Woodhall and Son, Ramsgate	587	10	0
G. Miriam, Ramsgate	659	0	0
G. J. Attwood and Co., Ramsgate	668	0	0
Paramor and Sons, Margate	650	0	0
J. T. May, Broadstairs	602	11	8
Paramors, Ltd., Margate	699	10	0
W. J. Ballard and Co., Ramsgate	673	10	0
J. R. Forewalk, Ramsgate	685	0	0
A. E. Goodbourn, Ramsgate	520	0	0
J. E. Baker, Margate	703	12	0
J. E. White,* Ramsgate	486	0	0

*Accepted.

Lynton.—For erecting Wesleyan church and school. Messrs. Latrobe and Weston, F.R.I.B.A., 44, Corn Street, Bristol, Architects.

Yandle and Sons	£3,057	15	10
Stanbury	2,500	0	0
B. Jones	2,176	0	0
R. Pickett	2,023	10	6
H. Sillifant	2,012	0	0
Bovey and Son,* Torquay	2,000	0	0

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(*Tenders continued on page viii.*)

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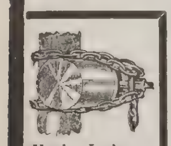
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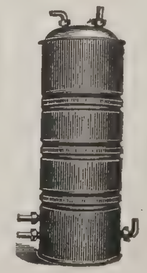

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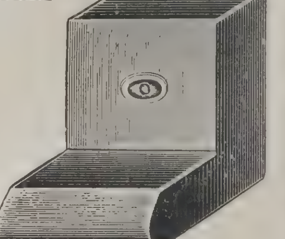

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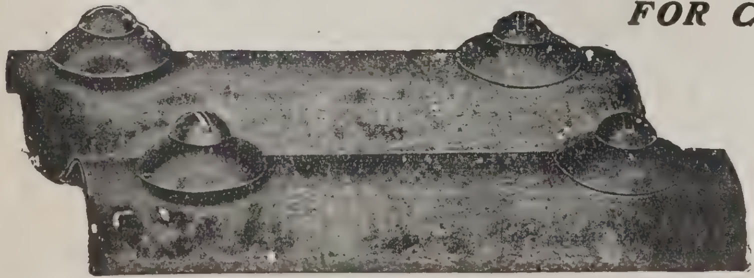

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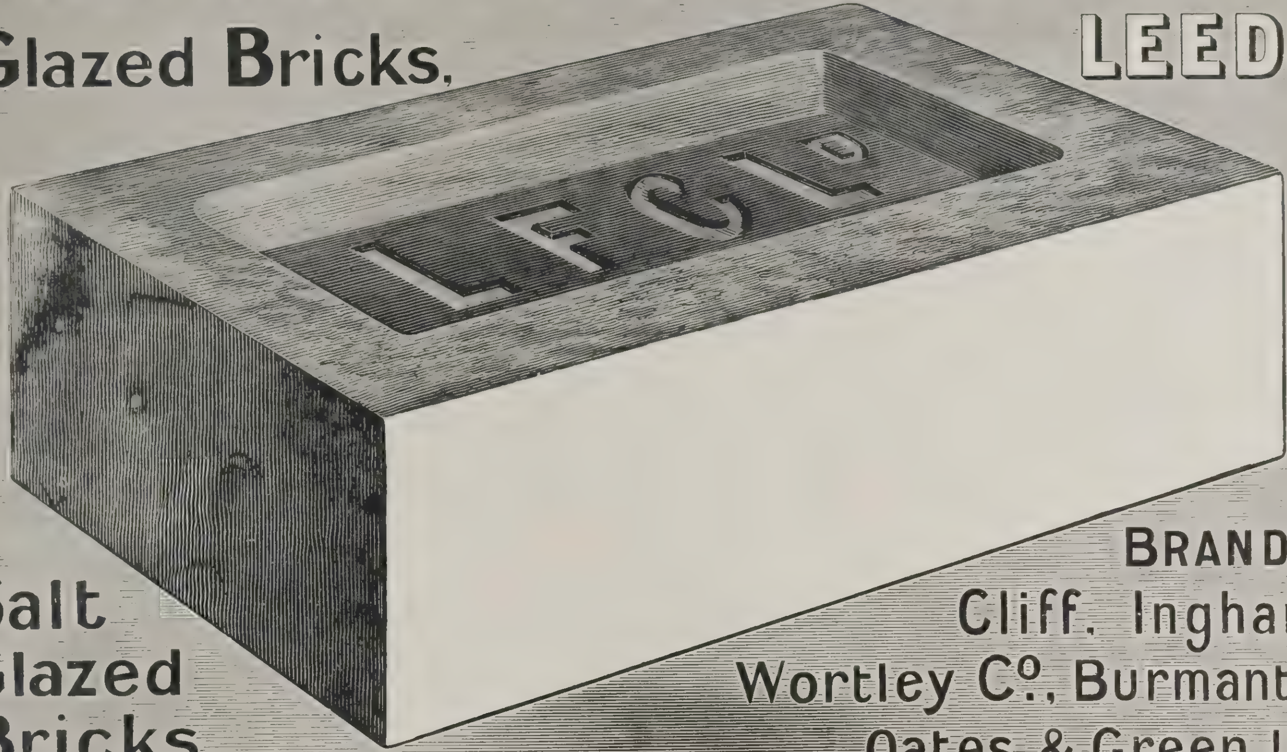

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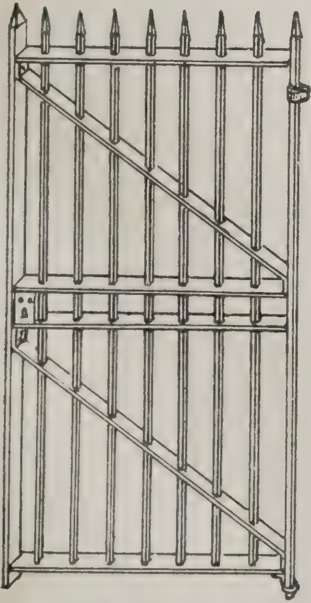

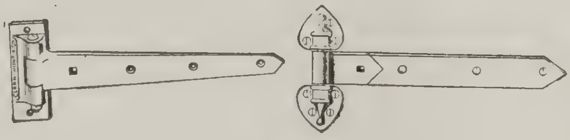

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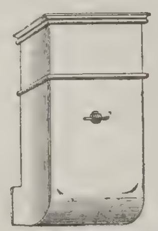

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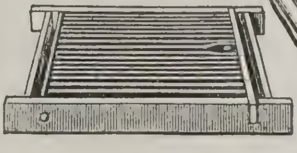

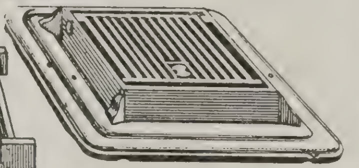

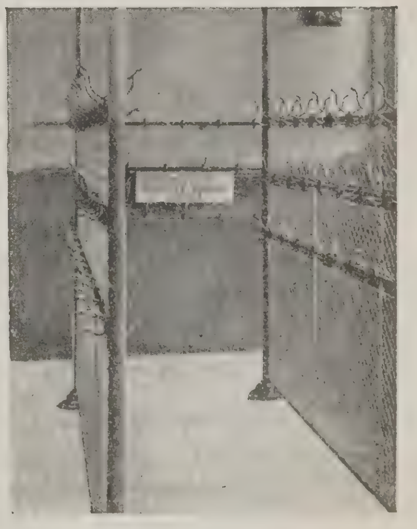

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GENERAL CATALOGUE ON APPLICATION.

(*Tenders continued from page vi.*)

Liverpool.—For erection of Franciscan church and friary, Fox Street and Bute Street, Liverpool. Messrs. Pugin and Pugin, Liverpool, architects.

Foster and Dicksee, Rugby	£15,551	0	0
Stephens, Bastow and Co., Ltd. Bristol	14,975	0	0
Wilkins and Sons, Bristol	14,890	0	0
T. Dilworth	14,425	0	0
Jones and Sons	14,230	0	0
Thornton and Sons	13,520	0	0
Henshaw and Sons	13,352	10	0
Travis and Wevill	13,280	0	0

Rest of Liverpool.

London.—For construction of the southern low level sewer No. 2, from Deptford to Battersea, for the London County Council.

Perry and Co. (Bow), Ltd., 56, Victoria Street, Westminster, S.W.	£583,610	0	0
Price and Reeves, 17, Waterloo Place, S.W.	562,945	0	3
S. Pearson and Son, Ltd., 10, Victoria Street, Westminster, S.W.	539,616	12	3
W. Scott and Middleton, Ltd., 98, Victoria Street, Westminster, S.W.	527,037	16	0
W. Muirhead and Co., 35, Queen Victoria Street, E.C.	525,873	13	2
Westminster Construction Company, Ltd., 22, Queen Anne's Gate, Westminster, S.W.	514,000	0	0
J. Mowlem and Co., Ltd., Grosvenor Wharf, Westminster, S.W.	499,768	0	0
H. M. Nowell, Bank Chambers, Stockton-on-Tees	473,575	10	3
G. Shellabear and Son,* 1, Mutley Plain, Plymouth	473,416	13	6

Chief Engineer's estimate, £480,000.

*Recommended for acceptance.

London.—For new school, Manor Lane, Lewisham, for the London County Council.

G. Parker and Sons, Peckham	£19,441	0	0
H. and H. F. Higgs, Hinton Road, Herne Hill	19,251	0	0
Perry and Co. (Bow), Ltd., Tredegar Works, Bow	18,718	0	0
J. Marsland and Sons, York Street, Walworth	18,160	0	0
J. Smith and Sons, Ltd., Junction Works, Norwood	18,007	0	0
H. L. Holloway, Union Works, Church Street, Deptford	17,983	0	0
J. Appleby and Sons, Cornwall Works, Southwark Park	£17,926	0	0
J. Garrett and Son, 83, Balham Hill	17,884	0	0
J. Longley and Co., Crawley	17,860	0	0
Holliday and Greenwood, Ltd., Brixton	17,524	0	0
G. E. Wallis and Sons, Ltd., 1, Albemarle Street	17,443	0	0
Kirk and Randall, Warren Lane Works, Woolwich	17,134	0	0
F. and T. Thorne, Isle of Dogs	17,126	0	0
C. Wall, Ltd., 4, Lloyd's Avenue	17,120	5	4
T. D. Leng, Evelyn Street, Deptford	17,018	0	0
J. and C. Bowyer, Ltd., Upper Norwood	16,985	0	0
Thomas and Edge, Anglesea Avenue, Woolwich	16,709	0	0
F. and E. Davey, Ltd.,* Elmer-avenue, Southend-on-Sea	16,235	2	7

Architect's (Education) estimate, £17,600.

*Recommended for acceptance.

New Southgate. — For the erection of Christ Church (Congregational). Messrs. Geo. Baines and Son, Architects, 5, Clement's Inn, Strand, London, W.C.

E. K. Wilton	£5,379	0	0
Dove Bros.	5,293	0	0
Patman and Fotheringham	5,110	0	0
Lawrence and Son	5,100	0	0
Mattock and Son	5,077	0	0
Knight and Son	5,077	0	0
Brightman and Son	4,991	0	0
Musselwhite and Sapp	4,982	0	0
Badley, Sons and Holness	4,859	0	0
F. G. Minter	4,650	0	0
George Dudley	4,624	17	6
J. Allen and Sons	4,600	0	0
J. W. Jerrim*	4,555	0	0

*Provisionally accepted with subsiding estimates, making a total of £4,597.

Peppard, near Reading.—For erection of a ten-bed ward and laundry, for the Trustees of Maitland Sanatorium for Working Class Patients, at Peppard. Mr. W. R. Howell, F.R.I.B.A., architect, Reading, and 18, Percy Street, W. :—

Bell and Sons	£1,378	10	0
J. Trinder and Son	1,210	10	0
C. Butler	1,198	0	0
G. S. Lewis and Bros.	1,180	0	0
Frazzi Co., Ltd	1,175	4	0
J. Cox,* Stoke Row, Henley	1,117	0	0

*Accepted.

Walthamstow.—For erection of a junior mixed department, Coppermill Road, Schools, for the Education Committee. Mr. H. Prosser, M.S.A., architect. Quantities by Mr. G. T. G. Wright, F.S.I., 3, Great Winchester Street, E.C. :—

T. W. Moss, Rayleigh, Essex	£4,050
B. E. Nightingale, Albert Embankment	3,948
Spencer, Santo and Co., Kensington, W.	3,813
Brown Bros., Grays, Essex	3,698
F. J. Coxhead, Leytonstone	3,697
H. J. Carter, Grays, Essex.	3,651
Appleby and Sons, Southwark Park	3,600
W. J. Maddison, Canning Town	3,556
Knight and Son, Tottenham	3,542
Lawrence and Son, Waltham Cross	3,540
Grand, Pettit and Co., Tottenham	3,490
F. and A. Willmott, Ilford	3,473
R. and E. Evans, Peckham, S.E.	3,469
Hammond and Son,* Romford	3,393

*Accepted.

Whitecroft.—Erecting two pairs of cottages at Whitecroft, Glos., for R. Phipps, Esq., J.P. Mr. L. J. Wornell, Architect, "Trevose," King Edward Street, Slough.

A. J. Colborne, Swindon, £570.

Whitehaven.—Accepted for the erection and completion of Public Elementary Schools, etc., Irish Street, Whitehaven, for the Town Council. Messrs. Oliver and Dodgshun, architects, Carlisle :—

Edwin Moorhouse, builder, Whitehaven; Edmund Burrow, slater, Workington; Northern Asphalt and Roofing Co., tar paving, Leeds; J. H. Reed and Sons, carpenters and joiners, Carlisle; William Strathern, plumber and glazier, Whitehaven; R. M. Ormerod and Son, reinforced concrete plasterer, and concretor, Carlisle; Edward McConn, painter, Whitehaven. Total, £10,303 4s. 6d.

Wickford.—Accepted for detached cottage, Swan Lane. Mr. J. Wornell, architect, Slough, Bucks.

F. W. Burtwell, Brentwood, £165.

Wincanton (Somerset).—For new house, Bayford Hill, Wincanton, for Mr. H. J. Collard. Mr. W. J. M. Morrish, architect. Quantities by the architect.

Guppy and Son, Sherborne	£1,145
Chapman and Co., Yeovil	1,038
Sainsbury Bros., Wincanton	1,030
Sweetman Bros.,* Wincanton	1,015

*Accepted.

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London as it never will be. The concluding number of "London Town—Past and Present" (a publication that has been ably and entertainingly written by Mr. W. W. Hutchings, and has been published in fortnightly parts during the past twelve months), contains an imaginative and speculative contribution on the future of London, by Mr. Ford Madox Hueffer. The article consists of nine chapters and extends over seventeen pages, in which are propounded many interesting theories that the man who knows London, either from force of circumstances or from choice, may profitably peruse. Mr. Hueffer realises that between probabilities and ideals there is a wide difference, and therefore he bases his potentialities upon present-day actualities. He traces from their source the many developments that have all contributed to make London what it is to-day. He passes in review the many catastrophies that have overtaken London, and he marvels that it still survives. He contemplates the Great Fire, and calls it "one of its crowning mercies." In fact London has endured innumerable hardships; has suffered under the ravages of plague; has known what it is to nurse a holocaust in its bosom—and yet it emerges triumphant, and stands to-day as one of the most wonderful triumphs of the resourceful and unfailing ingenuity of man. Mr. Hueffer passes on to the present day and advances some curious explanations of the eccentricities of the London cabman. To him it has always been a matter for some speculation and thought why the cabby invariably pursues a beaten track of bewildering by-ways, in preference to driving by the more spacious and direct routes. One theory, communicated to him by the son of an old cabman, was that "it was along of they sedan-chairs that they cabbies took the roads they did." Another ingenious explanation was that the roads ran where a river had once run; and horses went better where watercourses had been. Later Mr. Hueffer allows full play to his imagination, and gives us an extraordinary picture of his Utopia. He contends that "the problems of a city's life depend on means of communication." He would therefore build four or five railroads radiating from Trafalgar Square, and would equip them with the speediest possible trains. "Along the railways I would set motor-ways, and, between hedges, moving platforms for pedestrians and those who needed exercise. I would clean out the Thames and set upon it huge, swift and fine express launches." Further, Mr. Hueffer believes that the organisation of expeditious railroads that could whisk one from Alresford to London in the same time that it now takes to get from Hammersmith, would have the inevitable effect of making London less a residential city and more a place chiefly for the transaction of business and for amusement. He would abolish all steam and horse-drawn vehicles, and all noxious petrol-driven engines in favour of noiseless and odourless electricity. He fully believes that the Londoner has only to realise the important advantages to be gained by his suggested course and the transformation will be accomplished. Mr. Hueffer takes a "Bakerloo" map of London and traces its sinuous and eccentric movements. It starts from the Elephant and Castle because this is the point where a number of old roads meet. The line hopes eventually to get to Harrow. Does it go straight there? Glance at the map and see, "From the Elephant and Castle it deflects to meet a road coming from an old bridge—the tyranny of a remote Past. It deflects again to come up near an old railway terminus—tyranny of a later Past. It waves round again to hit another railway terminus, again to meet another road centre" and so on. Mr. Hueffer rightly characterises these extraordinary turns and twists as directly the result of tyrannies of the Past. A little later Mr. Hueffer makes surely an unwise statement, which at once classes him with a recent lecturer whose taste in architecture is beyond question, Gothic. "I shall hate to think of the City's knocking down the Mansion House or the Church's pulling down St. Paul's Cathedral. Yet my reason and my tastes alike tell me that the Mansion House is an ugly, clumsy and grimy block, and St. Paul's Cathedral an ostentatious, vulgar and unnational as well as an un-christian imitation." Mr. Hueffer redeems to some extent this somewhat harsh criticism a little later by adding, "But still, figuratively speaking, I would lay down my life before a grimy stone of one or the other was touched," although it is rather disappointing to learn that Mr. Hueffer's momentary burst of patriotism is due only to the fact that "the one is 'characteristic' and the other was built by Wren, has stood for a quarter of a thousand years and contains the bones of Nelson." Mr. Hueffer would make many drastic alterations in his London of the future. He would spare St. Paul's and the Mansion House, but he would pull down all the houses between Westminster Abbey and the Bank of England, "And there along Thames side would rise up the Abbey, the Houses of Parliament, Whitehall Banqueting Chamber (and none of the Government offices, the Scotland Yards, the stucco clubs, hotels, railway stations, and other tawdrinesses of the Victorian era). But there would be the great plain, with, on the north side the National Gallery, St. Martin's Church—and nothing till the eye lit on the Savoy Chapel, Somerset House, the two churches at the bottom of Kingsway, the better parts of the Temple, possibly the Law Courts; Temple Bar brought back, all the Strand and Fleet Street gone, a rise crowned by St. Paul's, the old city churches, the Guildhall, and then the Mansion House. Would it not be a vision of pinnacles and grey buildings? I like to revel in the dream and to dwell upon it whilst my fingers itch to begin some of the pulling down." All these and a great many more alterations of a like character Mr. Hueffer would make in order to transform London into an ideal city. Mr. Hueffer holds up Germany as an example worthy of imitation from the point of view of town-planning; and he is no great admirer of our own garden cities. He would like to stick, as it were, the point of a gigantic compass with a radius of sixty miles into the heart of London, and with it to describe a great circle. All the towns, villages, and hamlets included in this space he would call London. All the pseudo-rustic retreats, all the week-end cottages, all the garden cities and suburban villas should be razed; and in their place should be reared a city of "tall, white buildings. . . . for the transaction of business; there would be huge open spaces flagged with stone, from which would rise the memorial buildings—pinnacled, domed and august—" and this should be called London. It is a wonderful dream; but it represents, nevertheless, a picture of London as it never will be.

Whitgift Hospital Again. Mr. Ford Madox Hueffer is not the only person whose "fingers itch to begin some of the pulling down" of existing buildings; but, there is this difference between him and the others, that they would probably pull down what he would leave up, and vice-versa. The Croydon Councillors want to pull down the Whitgift Hospital; and one would not embark on the wearisome business of opposing the demolition of one of the very few buildings of any artistic value in the whole borough were it not that the Whitgift Hospital is a unique building, and justly famed for architectural, artistic and sentimental reasons. This is not the first or the second time that the building has been threatened, but the tocsin must be sounded to all the opposing bodies and to all who have any claim to artistic feeling to marshal forces for the defence of the old buildings. The reasons for destruction previously advanced have always been utilitarian: the narrowness of the streets, the delay to traffic; the number of accidents occurring, the congestion of the tramways and so on. These were weighty reasons and demanded remedies which the opponents of destruction were not slow to point out. But the philistinism which always lurked behind the ostensible reasons is no longer to be hidden. Indeed the "Croydon Chronicle" of July 24th gives full cry to it, and the utterance is so remarkable that we take leave to reproduce it. "But, perhaps, one of the chief arguments in favour of the removal of the hospital is that based upon architectural grounds. Comparing it with some of the fine stately buildings erected close by in High-street, George-street, and North End, no one with the most elementary ideas of architecture, could possibly say that the Whitgift Hospital is an imposing structure. Its style is altogether out of harmony with the surroundings. Looked at from the outside it is certainly not ornamental, and, contrasting the whole corner with that opposite, it is more or less an eyesore, for it is somewhat deadening and depressing. Only the removal of the hospital, the widening of the roadway, and the erection of a building of more pretentious design could give that corner the imposing appearance that it ought to possess." That the Whitgift Hospital should be made the scapegoat for the bad building around it is a wholly new line of argument. It suffices that as an example of dignity and proportion it so puts its surroundings to shame that its existence as a silent monitor can no longer be tolerated. We will join issue with our contemporary. "No one with the most elementary ideas of architecture," it says, "could say that the Whitgift Hospital is an imposing structure." Well, we do; and we claim to have more than elementary ideas of architecture; and to know the minds of those whose right to speak upon architecture is unquestionable. If the Borough of Croydon chooses to destroy one of the few—the very few—works of art that it possesses, it must do so, though fortunately the proposal must pass the scrutiny of Parliament. We defend the Whitgift Hospital on no ground of archæological or sentimental interest. It is a fine piece of architecture, and a work of art. And those who value our fast diminishing stock of fine old buildings would do well to press upon Parliament the urgency for drawing up a list of our remaining national monuments that the country may not be bankrupted of its architectural treasures at the hands of those who never know nor care for them. Meanwhile the destroyers at Croydon would do well to keep to their utilitarian reasons. It is safer.

Architectural Education. The illustrations on following pages, which give some indication of the work at the Liverpool University School of Architecture, are one more proof that the present forward movement in architectural education is not only a very sound one, but is already productive of good results. For not merely is the work meritorious; but it indicates that our professors and masters are returning to the pot-hooks of architecture, or in other words are inculcating a sound knowledge of the Orders as the basis of the architectural curriculum. It has been the fashion of recent years to sneer at the orders, to view them in much the same light as the study of dead languages is regarded by a certain section of our militant educationists. We are inclined to grant that the study of Greek or Latin is not necessarily essential to the man whose future career will be devoted to commercial pursuits; that in the multitude of things that may be learnt it is necessary and desirable to sacrifice the old tongues for the modern languages. But this merely emphasises the essential differences that divide art and commerce in the matter of education. The basis of commerce change and vary with the expansion of the world's trade and the world's progress. The basis of architecture are fundamental and never alter. One may give new expression to them but one cannot change their character It is the somewhat restless activity of the moderns to find a new expression that has led to the passing fashion of decrying the Orders as so much unnecessary baggage that hampers the student in his progress. The passion for short cuts to knowledge chafes at the delay which the study of the Orders imposes. It desires to be up and doing; it believes that to attempt something, and to keep on attempting something, is a better way of learning than to laboriously study first how the thing should be done before setting about it. The result is that the student, without a proper grasp of the principles that govern his work, starts to design without the most essential qualification. He will be dragooned into some semblance of respectability so far as the common run of buildings is concerned, but he will do things not because he has reasoned them out; but because it is the usual way of doing them or because he has been told to do them in that way. His knowledge will be that of the parrot, not the thinker. And directly he is faced with an original problem he will go to pieces because there is no precedent for him to fall back on, and his brain has never been trained to devise a solution. The same fate has befallen the short cuts to knowledge in other branches of education. The new improved methods for spelling and arithmetic used in our elementary schools only results in the children being worse spellers and calculators than their fathers, and the grotesque mistakes made are standing evidences of the futility of the methods followed. There is no royal road to learning, no backdoor to the inner recesses of the temple of knowledge. The great value of the Orders has ever been to inculcate a sense of proportion, the absence of which is the most conspicuous defect in the architecture of to-day.

OUR ROYAL ACADEMY ELECTION.

Result of First Ballot.

The result of the first ballot to select the twenty architects who will be eligible in the second ballot is declared by the scrutineers, Messrs. A. W. S. Cross, V.P.R.I.B.A., and E. A. Rickards, F.R.I.B.A., as follows:—

1. Edwin L. Lutyens, F.R.I.B.A., London.
2. Ernest George, P.R.I.B.A., London.
3. Henry T. Hare, F.R.I.B.A., London.
4. Ernest Newton, F.R.I.B.A., London.
5. Leonard Stokes, F.R.I.B.A., London.
6. J. J. Burnet, A.R.S.A., F.R.I.B.A., Glasgow.
7. E. A. Rickards, F.R.I.B.A., London.
8. E. Guy Dawber, F.R.I.B.A., London.
9. Professor Beresford Pite, F.R.I.B.A., London.
10. Thos. E. Collcutt, F.R.I.B.A., London.
11. R. S. Lorimer, A.R.S.A., F.R.I.B.A., Edinburgh.
12. J. S. Gibson, F.R.I.B.A., London.
13. William Flockhart, F.R.I.B.A., London.
14. H. V. Lanchester, F.R.I.B.A., London.
15. Professor W. R. Lethaby, F.R.I.B.A., London.
16. Temple Moore, F.R.I.B.A., London.
17. W. D. Caröe, M.A., F.R.I.B.A., F.S.A., London.
18. R. F. Atkinson, F.R.I.B.A., London.
19. C. E. Mallows, F.R.I.B.A., London.
20. John W. Simpson, F.R.I.B.A., London. Last two equal.

The following gentlemen also received votes:—

H. Percy Adams, F.R.I.B.A., London; Maurice B. Adams, F.R.I.B.A., London; J. P. Alison, F.R.I.B.A., Hawick; John Anderson, A.R.I.B.A., London; Sir R. Rowand Anderson, LL.D., F.R.S.E., F.R.I.B.A., Edinburgh; C. R. Ashbee, M.A., F.R.I.B.A., London; Geo. C. Ashlin, R.H.A., F.R.I.B.A., Dublin.

J. L. Ball, Birmingham; C. E. Bateman, F.R.I.B.A., Birmingham; E. Ingress Bell, F.R.I.B.A., London; W. H. Bidlake, M.A., A.R.I.B.A., Birmingham; Hippolyte J. Blanc, R.S.A., F.S.A., Scot., F.R.I.B.A., Edinburgh; Detmar Blow, F.R.I.B.A., London; J. M. Bottomley, Middlesbrough; Walter H. Brierley, F.R.I.B.A., F.S.A., York; G. Washington Browne, R.S.A., F.S.A. Scot., Edinburgh; G. Bertram Bulmer, F.R.I.B.A., Leeds.

P. M. Cameron, Edinburgh; the late J. Archibald Campbell, F.R.I.B.A., Glasgow; J. Coates Carter, F.R.I.B.A., Cardiff; Walter Cave, F.R.I.B.A., London; P. MacGregor Chalmers, Glasgow; Basil Champneys, M.A., London; H. A. Chapman, A.R.I.B.A., Leeds; F. Dare Clapham, F.R.I.B.A., London; H. Chatfeild Clarke, F.R.I.B.A., London; H. C. Clifford, F.R.I.B.A., Glasgow; Robert Cochrane, LL.D., I.S.O., F.R.I.B.A., F.S.A., Dublin; J. N. Comper, London; A. W. Cooksey, A.R.I.B.A., London; E W. M. Corbett, F.R.I.B.A., Cardiff; Alfred Cox, F.R.I.B.A., London; G. A. Cox, Birmingham; A. Hunter Crawford, F.R.I.B.A., Edinburgh; A. W. S. Cross, M.A., V.P.R.I.B.A., London; R. Curwen, A.R.I.B.A., London.

Arthur J. Davis, London; Thomas Davison, A.R.I.B.A., London; Campbell Douglas, F.R.I.B.A., Glasgow; John Douglas, Chester; H. P. Burke Downing, F.R.I.B.A., London; J. F. Doyle, Liverpool; Sir Thomas Drew, P.R.H.A., LL.D., F.R.I.B.A., Dublin .

Sir William Emerson, F.R.I.B.A., London; Francis Evans, Birmingham.

Horace Field, F.R.I.B.A., London; Banister F. Fletcher, F.R.I.B.A., London; H. L. Florence, F.R.I.B.A., London; T. H. Fosbrooke, Leicester; J. B. Fulton, A.R.I.B.A., London.

E. M. Gibbs, F.R.I.B.A., Sheffield; J. A. Gotch, F.R.I.B.A., F.S.A., Kettering; Alex. Graham, F.R.I.B.A., F.S.A., London; Sydney K. Greenslade, A.R.I.B.A., London.

Edwin T. Hall, F.R.I.B.A., London; Stockdale Harrison, F.R.I.B.A., Leicester; William Henman, F.R.I.B.A., Birmingham; A. Herbert, A.R.I.B.A., Leicester; C. H. Holden, A.R.I.B.A., London; John Honeyman, R.S.A., LL.D., Glasgow; George Hubbard, F.R.I.B.A., F.S.A., London.

George Jack, London; J. J. Joass, A.R.I.B.A., London.

William Kelly, Aberdeen; F. R. Kempson, Cardiff; John Kinross, Edinburgh; A. E. Kirk, A.R.I.B.A., Leeds; Ralph Knott, London.

W. Leiper, R.S.A., F.R.I.B.A., Glasgow; W. T. Lockwood, F.R.I.B.A., Chester; Geoffry Lucas, A.R.I.B.A, London; W. H. Lynn, R.H.A., Belfast.

Mervyn E. Macartney, B.A., F.R.I.B.A., F.S.A., London; Alex. McGibbon, A.R.I.B.A., Glasgow; A. Marshall Mackenzie, A.R.S.A., LL.D., F.R.I.B.A., Aberdeen; Ellis Marsland, M.S.A., London; E. J. May, F.R.I.B.A., London; H. B. Measures, M.V.O., F.R.I.B.A., London; Charles Mewès, Paris and London; James Miller, A.R.S.A., F.R.I.B.A., Glasgow; Arnold Mitchell, F.R.I.B.A.; James A. Morris, F.R.I.B.A., Ayr.

Sir Charles H. Nicholson, Bart, M.A., F.R.I.B.A., London.

R. Caulfield Orpen, B.A., Dublin.

S. Perkins Pick, F.R.I.B.A., Leicester; Rowland Plumb, F.R.I.B.A., London; A. N. Prentice, F.R.I.B.A., London; Edward S. Prior, M.A., F.R.I.B.A., F.S.A., London.

C. H. B. Quennell, F.R.I.B.A., London.

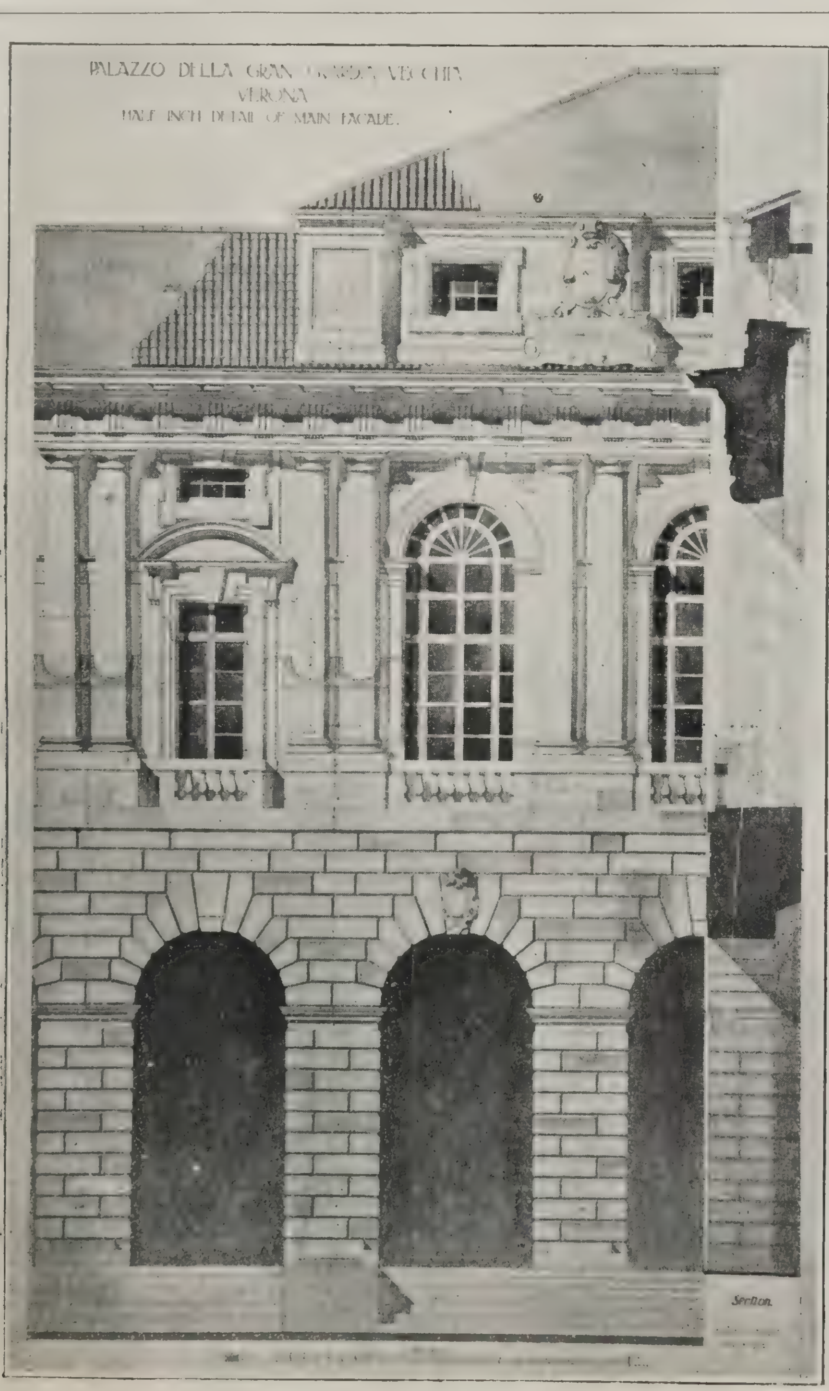
Professor C. H. Reilly, M.A., A.R.I.B.A., Liverpool; Halsey Ricardo, F.R.I.B.A., London; W. E. Riley, F.R.I.B.A., London; J. Robertson, Inverness; G. E. Robinson, Cardiff; Percy Robinson, F.R.I.B.A., Leeds; E. R. Robson, F.R.I.B.A., F.S.A., London; W. H. Romaine-Walker, A.R.I.B.A., London; W. G. Rowan, F.R.I.B.A., Glasgow; S. B. Russell, F.R.I.B.A., London.

R. Weir Schultz, London; M. H. Baillie Scott, Bedford; G. Gilbert Scott, London; J. Oldrid Scott, F.R.I.B.A., F.S.A., London; H. D. Searles-Wood, F.R.I.B.A., London; Edwin Seward, F.R.I.B.A., Cardiff; Professor F. M. Simpson, F.R.I.B.A., London; Frank W. Simon, F.R.I.B.A., London; Geo. J. Skipper, F.R.I.B.A., Norwich; John Slater, B.A., F.R.I.B.A., London; R. Phenè Spiers, F.R.I.B.A., F.S.A., London; James A. Swan, Birmingham.

Sir Henry Tanner, I.S.O., F.R.I.B.A.; Sir A. Brumwell Thomas, F.R.I.B.A.; Arnold Thornely, F.R.I.B.A., Liverpool; W. H. Thorp, F.R.I.B.A., Leeds; A. Hessell Tiltman, F.R.I.B.A., London; C. Harrison Townsend, F.R.I.B.A., London; Thackeray Turner, F.R.I.B.A., F.S.A., London.

E. M. Bruce Vaughan, F.R.I.B.A., Cardiff; Frank T. Verity, F.R.I.B.A., London; C. F. A. Voysey, London.

Fairfax B. Wade, F.R.I.B.A., London; Septimus Warwick, A.R.I.B.A., London; Paul Waterhouse, M.A., F.R.I.B.A., London; John Watson, F.R.I.B.A., Edinburgh; M. Watson, Edinburgh; W. Watson, London; Philip Webb; H. D. Wigglesworth, F.R.I.B.A., London; Leslie Wilkinson, A.R.I.B.A., London; G. H. Willoughby, F.R.I.B.A., Manchester; H. W. Wills, A.R.I.B.A., London; Edgar Wood, A.R.I.B.A., Manchester; W. Woodward, F.R.I.B.A., London; Percy S. Worthington, M.A., F.R.I.B.A., Manchester; Thomas Worthington, F.R.I.B.A., Manchester.


PALAZZO DELLA GRAN GUARDIA VECCHIA
VERONA
HALF INCH DETAIL OF MAIN FACADE.

LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE. MEASURED WORK BY H. J. ROWSE, TRAVELLING SCHOLAR.

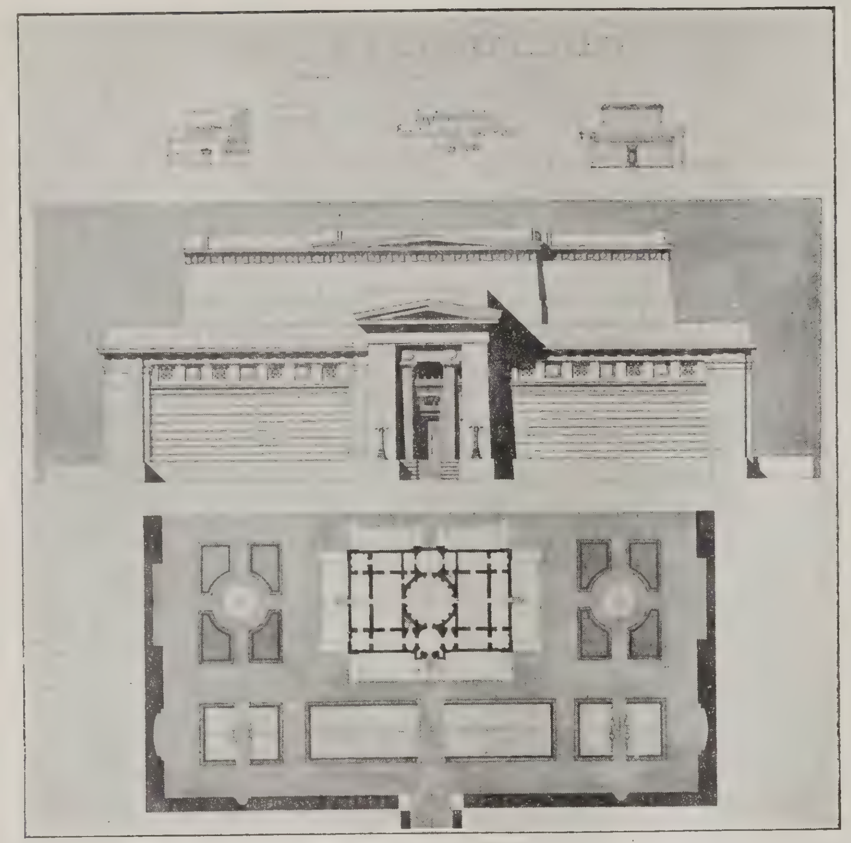
UNIVERSITY OF LIVERPOOL SCHOOL OF ARCHITECTURE.

The annual exhibition of students' work, held in the Tate Library of the University, this year furnishes striking evidence of the extent to which the modern appreciation of the best in classic has advanced within the last five years.

With a sanity of perception, for which we too often vainly seek in other quarters, Prof. Reilly has trained his students in the only tradition relevant to our present-day civilisation, and has imbued them, as our inspection of their work convinced us, with a breadth of view and sincerity of purpose to which we in England have become strangely unaccustomed. The designs exhibited betray none of that triviality of conception and crudity of execution which we fear the Americans have come to associate so justly with architecture in this country. A comparison of the students' designs, moreover, shows that this competent maturity has not been attained by a rigidly stereotyped system of training tending to produce mere facility within definite limitations. Rather there is a refreshing individuality of manner, a distinctly personal note in their productions which is yet far removed from cheap eccentricity in detail. The work exhibited is divided into two classes—that submitted for the final certificate examination, and that for the final examination for the degree of B.A., with honours in architecture. Candidates in both classes were eligible for the various travelling scholarships offered.

Of the work of the certificate students, that of Mr. E. T. Forster appeared to us to be on the whole the most advanced. His designs for a Campo Santo and an Art Gallery show a definite Greek tendency, and an appreciation of Fifth Century Hellenic detail which is no doubt mainly due to his careful measured studies of some of the monuments of the Greek revival in the district. Another certificate student, Mr. E. C. Lemon, whilst apparently not so far advanced, still gives considerable promise. He appears to have taken Sanmichele as his model in academic design, and has attained something approaching facility in the latter's technique.

As might naturally be expected, the designs of the final degree students are altogether more advanced, and display a greater knowledge than those of the certificate men. Where both classes have been given the same problem, the solution of the former is invariably more elaborate and competent, and there is evident a more cautious striving after development along individual lines. As an illustration of this, we reproduce a sketch design for a terrace and pavilion to a promenade in a public park, submitted by Mr. Lionel B. Budden, a study which appears to combine the composition of Alexander Thompson with the refinement of



LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE. DESIGN FOR AN ART GALLERY BY LIONEL B. BUDDEN, B.A. HONS. STUDENT. FINAL.

Burton. In this student's later work a more American tendency is evident, and his design for an art gallery, though in its main lines again reminiscent of Thompson, is obviously, in so far as the detail is concerned, influenced by trans-Atlantic models.

The same subject of an art gallery is treated by another degree student, Mr. H. A. Dod, in an entirely different fashion, and is admirably worked out in rendered drawings of very agreeable colour. In fact, these two designs, considered with that of an intermediate degree student, Mr. E. Prestwich, who also presents a solution of the art gallery problem that is a happy combination of scholarship and originality, constitute in themselves convincing proof of the really big scope which Prof. Reilly gives to his students whilst yet insisting on constant restraint and absolute freedom from affected eccentricity.

A genuinely appropriate design for a country inn is the work of Mr. Sydney H. Colton. In this, as in his other domestic work, he is distinct from the rest of the degree students by his choice of a purely Georgian technique, due, as his measured plottings would appear to show, to early contact with the examples of that style in which the City of Liverpool is so rich. The careful working drawings (⅛in. scale and ½in. scale) of the design are, however, typical of all the domestic work produced in the school, in that they are well figured and written to, and their construction very fully considered.

The final design examination, conducted as in the Ecole des Beaux Arts, with separate rooms for the candidates, lasted, we were informed, one calendar month, during which time each student was required to complete an adequate number of explanatory-rendered drawings of a design for a villa and garden, "intended for a wealthy man of artistic and literary tastes." One of the designs, that by Mr. Dod, the author of the art gallery to which we have referred above, is a thoroughly ingenious adaptation of the Petit Trianon, and with its garden makes an exceedingly pleasant composition. In Mr. Budden's conception of the subject, approached from another point of view, we see what we regard as a consistent application of his manner of expression to lighter needs.

Among the optional subjects for the final degree students, is included modelling. We reproduce two examples of work cast, which may be taken as fairly typical of the character and quality of the bulk of that exhibited—the one a faithful rendering by Mr. Dod of the famous Lysiciates scroll, the other a design for a herm-head, by Mr. Budden, being a detail of an accessory in a scheme for an Italian garden.

From a mass of work exhibited by first year certificate and degree students, we have selected for reproduction a design for a mausoleum, by Mr. W. A. Allen. Particularly notable in the first year work is the composition in "the orders" which has been recently introduced. Instead of the mere dry copying from plates, Prof. Reilly has made each student compose a sort of frontispiece with the order and its details in the foreground, whilst the building, from which it is taken, and an imaginary landscape, form the background. Some of these have been elaborately coloured, and make very effective drawings, besides introducing into what has hitherto been a rather dull subject, the element of fancy and design.

An interesting feature in the exhibition is the extraordinarily careful measured drawings made in Italy by a former travelling scholar, Mr. H. J. Rowse, of which we reproduce two examples.

Mr. J. J. Shannon, A.R.A., was at a general assembly of Academicians and Associates last Wednesday elected a Royal Academician. Mr. Shannon, who was born in New York State in 1862, came to England in 1878, and was elected A.R.A., in 1897. His work has been mainly in portraiture.

* * *

The Lambeth Borough Council has been awarded £81,342 by the arbitrator for their portion of the Lambeth foreshore required by the London County Council for the site of the New County Hall. The amount claimed was £179,138.

Buildings in Progress and Completed.

BISHOP AUCKLAND.—The foundation stone of the new Hippodrome was laid recently. The building, which is expected to be opened in December, is to be of brick with stone dressings, with seating accommodation for 1,800 persons, and will cost over £10,000. The architects are Messrs. J. J. Taylor and Minor, A.R.I.B.A., and the contractors are Messrs. Nicholds and Reynolds, Limited, Westminster.

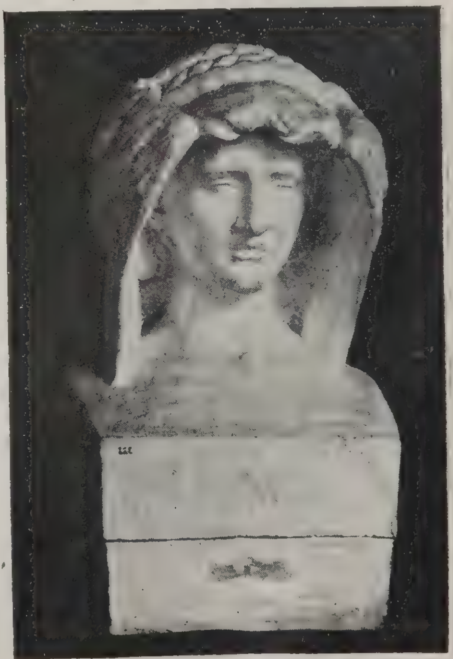
BLACKBURN.—A new church, St. Jude's, is shortly to be erected here, from the design of Messrs. A. R. Gradwell and Son, architects. Seating accommodation will be provided for 603 worshippers.

BOCKING.—Memorial stones of a new extension to the Wesleyan Schools have been laid. The cost of the extension will be about £500. The plans have been prepared by Mr. Albert Thompson, Cross Roads, and the work is to be completed by Mr. James Greenwood, builder; Mr. Ineson Taylor, joiner; Mr. W. H. Greenwood, plumber; Mr. A. Sunderland, slater; and Mr. J. Brearley, plasterer.

CREWE.—A new intermediate school—to accommodate 350 scholars—has been built in Ruskin Road. It is intended for the youth of both sexes who have won scholarships. The cost has been about £20,000. Mr. Beswick, of Chester, is the architect.

DRAX.—The new buildings at the Grammar School have been erected to plans prepared by Mr. H. B. Thorpe, of Goole, and the contractor was Mr. Walker, of Goole. The teaching premises have cost £3,800, and the boarding part about £4.500.

DUBLIN.—The new office building, No. 9, College Green, for the Sun Insurance office, is now completed. The building is designed in the Italian Renaissance style. The basement and ground floor are faced with Ballynockin granite. The first, second, and third storeys are faced with Mount Charles stone, worked in Dublin. Two wrought iron and granite balconies of elaborate design front the first storey windows. Above this storey appear Ionic columns with carved capitals. The cornice has carved medallions. The fourth floor windows are in the slope of the roof, and are concealed by a balustrade parapet. All the floors are of fireproof construction. Passing through a panelled vestibule, the visitor



LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECT URE. "HYPNOS." MODELLING FROM THE CAST LIONEL B. BUDDEN, B.A. HONS. STUDENT. FINAL

LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE. LYSICRATES SCROLL. MODELLED FROM THE CAST BY H. A. DOD, B.A. HONS. STUDENT. FINAL.

finds the space appropriated to the reception of the public paved with alternate squares of green Tinos marble and white Pentelikon. The rest of the general office is floored with wainscot oak, and the walls are panelled to a height of nine feet with Cuban mahogany, and above that are lined with pale pink Skyros marble set in frames of Pentelikon. The chimney-pieces are adorned with wreaths, shields, and flowers carved in limewood. The hearths and grates are in green Cipollino and Verde Antico marbles. Two electroliers present an adaptation of an eighteenth century chandelier. An Otis passenger lift serves from the public space to all the floors. The desks and other fittings and the counter are of mahogany. A marble staircase, with a wrought iron balustrade and moulded brass handrail, leads from the committee office to the upper floors. The first floor is devoted to the managerial department, board-room, and waiting-room, which are all panelled with Cuban mahogany and floored with wainscot oak. The board-room has carved limewood ornament to the chimney-piece. The second and third floors are fitted as offices for the companies. The fourth floor contains caretaker's apartments. The building is lit with electric light throughout on the most up-to-date lines. This, together with an elaborate telephone system, has been installed by Messrs. Curtis and Son, of Dublin. The heating throughout is by open fires. Mr. Horace Porter, of Russell Square, London, architect to the Sun Insurance Co., was the designer, and the builder was J. R. Thompson, of Fairview, Dublin.

EDINBURGH.—The Town Council have had under consideration plans, prepared by Mr. R. S. Lorimer, A.R.S.A., for the new chapel for the Order of the Thistle, to be added to St. Giles's Cathedral. The plans, which show a chapel 33ft. long, 17ft. wide, and 35ft. high to the apex of the vaulting, have already been approved by the Lord Provost's Committee.

EAST COWTON.—The foundation stone of a new established church has been laid. The cost will be about £1,850. To Mr. Eccles, of Messrs. Woolfall and Eccles, Liverpool, was entrusted the preparing of plans for the new church. It is early English in style. The church will be about 60ft. by 30ft., and the seating accommodation will be for 150. It will be built of Northallerton brick, with stone facings from the Darleydale Quarry, Derbyshire. The contractor is Mr. T. Boyd, of Darlington.

FENNY STRATFORD.—A new Wesleyan Church, to cost about £2,500, is in course of erection. Messrs. Ewen Harper and Bros., of Birmingham, are the architects, and Mr. A. P. Hawten, of Northampton, the builder.

FROSTERLEY (WEARDALE).—The new church hall which was opened here recently provides accommodation for 260 persons. Built to the designs of Mr. W. Bedlington, the hall is constructed of stone taken from the local quarries, and has cost £1,000.

GREENFIELD, near Holywell.—The Flintshire County Council have accepted the tender of Messrs. E. Blane and Son, Connah's Quay, at £4,100, for the erection of a new council school here.

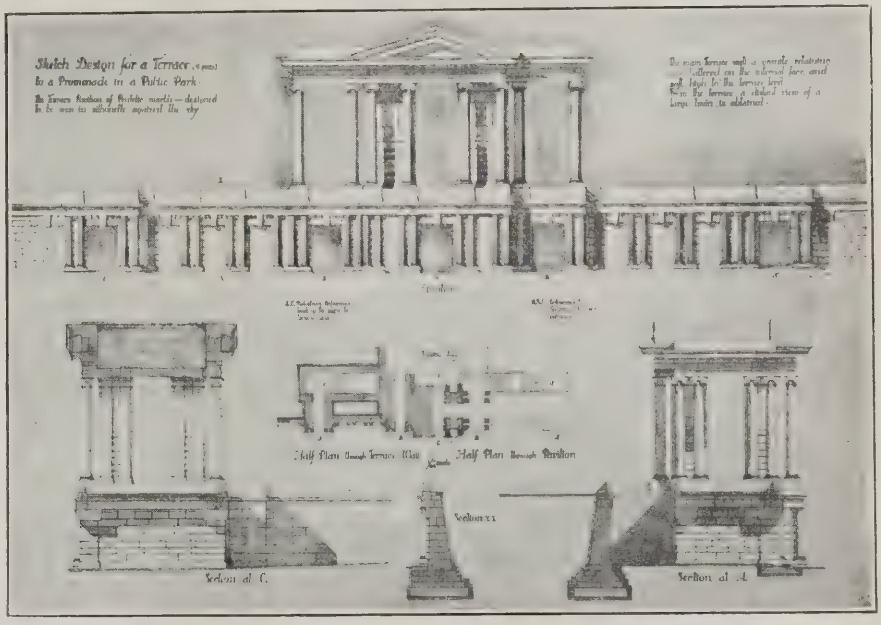
HASLINGTON.—The church is to be rebuilt, the portion in hand comprising the chancel, vestry, heating chamber and organ chamber, at a cost of £1,400. Mr. Reginald T. Longden, Burslem and Leek, is the architect, and Mr. Matthews, Nantwich, the builder.

LEEDS.—The Hunslet Moor Council School has been erected consequent upon the condemnation of the Hunslet St. Peter's Council schools by the Board of Education. The school consists of two blocks, one of which provides accommodation for 360 girls on the ground floor, 360 boys on the upper floor, the other providing for 388 infants on the ground floor and containing handicraft, cookery, laundry, and house-wifery centres on the upper floor. A central hall has been provided for each department, and the classrooms are mostly arranged to accommodate sixty children. The buildings are lighted throughout by electricity, and the drainage and sanitary appliances are of the most modern type. The school has been built with local bricks and stone, under the supervision of the committee's architect, Mr. Fred. Broadbent. The total cost of the site, buildings, and fittings will be about £20,000.

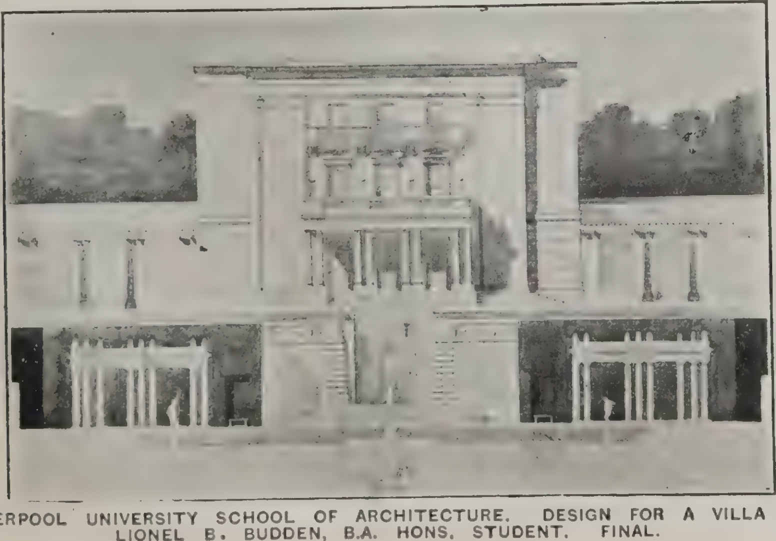
LONDON (BARNSBURY, N.).—The Bishop of London recently opened a new mission hall, which, including the site, has cost £4,100. The architect was Mr. J. S. Alder, and the builders were Messrs. Dove Brothers, Islington.

LONDON.—The London County Council have approved of the plans of a new concert hall which is to be erected in John Street and Durham Street, Adelphi. The building, which has been designed by Messrs. Hayward and Maynard, architects, of John Street, is to be adapted from a portion of the old Coutt's Bank, and will accommodate about 400 people.

LONDON.—Many important alterations have been made at the Hippodrome since it was closed some months ago. The arena is covered with seats, which can be removed when occasion demands, and the orchestra, which formerly occupied a position in the circle, has been shifted to the usual place in front of the stage. The boxes have been so aligned that a clear view of every part of the stage can be obtained. The circle has been enlarged and supplied with balustrades; and, on either side of a new cinematograph box which occupies a space formerly known as the crush room, there are now spacious entrances to the stalls. The proscenium, however, has undergone the most important alterations. It has been brought forward about 20ft., thus giving the stage a depth of 40ft. and a width of 74ft. from wall to wall, with a width of 44ft. at the opening. The stage has been divided into three sections, which allow of an entirely novel manner of working.

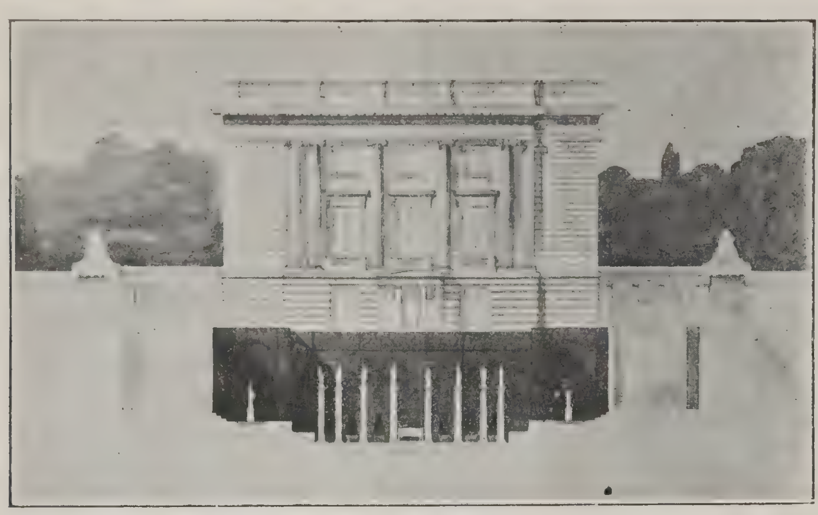

Sketch Design for a Terrace
to a Promenade in a Public Park
Half Plan through Terrace Wall
Half Plan through Pavilion
Section x x
Section at C.
Section at A.

LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE. LIONEL B. BUDDEN, B.A. HONS. STUDENT. FINAL.



LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE. DESIGN FOR A VILLA BY LIONEL B. BUDDEN, B.A. HONS. STUDENT. FINAL.

NORTHAMPTON.—The new Holy Trinity Church, which was consecrated recently, is a further notable example of modern perpendicular Gothic. The church consists of a nave, with chancel of equal width, north and south aisles with porches, a baptistery at



LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE. DESIGN FOR A VILLA BY H. A. DOD, B.A. HONS. STUDENT. FINAL.

the west end, and a Lady chapel on the south side of the chancel; and the cost, including furnishing, will be about £10,000. Mr. M. H. Holding, A.R.I.B.A., and his son were the associated architects, and the general contractor was Mr. R. Cosford; all three gentlemen being of Northmapton.

OBAN.—A sanatorium for Argyllshire has been opened here, accommodation being provided for 40 patients. Mr. Neil Gillies, of London, is the architect.

ONLLWYN.—A new Welsh Congregational Church is being erected here from the designs of Mr. W. Beddoe Rees, Cardiff. The church, which will seat 620, has a school adjoining it for about 300, and will cost about £3,000. Messrs. E. Turner and Sons, Cardiff, are the builders.

QUILTY (IRELAND).—The cost of a new church, which is in course of erection here, is estimated at about £1,900. Messrs. O'Malley and O'Rourke, of Limerick, are the architects, and Mr. John Ronan, of Kilrush, is the builder.

SUTTON-IN-ASHFIELD.—The foundation stone of St. Michael's Church was laid recently. The chancel and vestry were built about 24 years ago, and a temporary corrugated iron nave was added some time later. Mr. Louis Ambler, F.R.I.B.A., prepared plans in 1905 for the completion of the church, and the work is now being carried out. The church is in the early English style, and provides sitting accommodation for 600 persons. Messrs. John Thompson and Co., of Peterborough, are the builders.

THORNTON HEATH.—The foundation stone of a new Baptist Church, which is to replace the existing temporary building, has been laid. The new building, which is to take the form of a memorial to the late C. H. Spurgeon, has been designed by Messrs. George Baines and Son, of 5, Clement's Inn, Strand, in the Gothic style. The church, when completed, will seat 830 persons—530 of which will be accommodated on the ground floor—and it is estimated to cost £4,000.

WICK.—At a cost of about £8,000 a new higher grade school is being built from the designs of Messrs. D. and J. R. McMillan. The contractors for the work are:—Mason work, D. H. Harper, Wick; carpenter work, Hendry and Keith, Aberdeen; slater work, George Farquhar, Aberdeen; plasterer work, James Smith, Wick; plumber work, John Blaikie and Son, Aberdeen; painter work, John Mason and Son, Aberdeen; glazier work, Robert Shearer, Wick; iron beam work, Redpath, Brown, and Company, Edinburgh; gates and railings, Wares and Company, Wick; heating engineer, Robert Tindall, Aberdeen.

WIMBLEDON.—The consecration of the eastern portion of the new church of St. Matthew, the foundation stone of which was laid about a year ago, was performed recently. The completed church has been designed by Mr. E. C. Shearman, A.R.I.B.A.

WINDSOR.—Plans have been passed by the Town Council for the re-erection of the theatre, which was partially destroyed in February last. The new building, which is to be in the Renaissance style, will have three frontages—Thames Street, Thames Avenue, and River Street—and the purchase of site and adjoining properties, the erection of the building and the furnishing will involve a capital expenditure of £20,000. The combined accommodation of pit, stalls, private boxes, and a spacious gallery, will be 1,150 persons. The architect is Mr. Henry Percival, who has designed a number of other theatres.

RIO DE JANEIRO.—The Municipal Theatre, just completed here from the designs of Senhor F. de Oliveira Passos, is, with the exception of the Paris Opera House, the most expensive entertainment building in the world, having cost, exclusive of the site, £678,500. Of this some £60,687 has been sunk in machinery and electrical plant, mostly of English make, and £57,437 on marble and bronze. The principal facade is in Italian marble and Rio granite, surmounted by a copper dome over the centre of the building crowned by an eagle of gilt bronze, whose outstretched wings measure nearly 20ft. across. The building is spoilt by the stage portion finished in a slate-colour stucco. The proscenium opening is 38ft. high and 43ft. wide, and the stage is enormous and equipped with the latest electrical machinery. The grand staircase is carried out in marble, onyx, and gold.

Proposed New Works.

BATLEY.—While undergoing cleaning operations recently, the roof of the Parish Church was discovered to be in an alarming condition of decay. For some time past it has been the intention of the Vicar to do away with the plaster underdrawing, and to restore the roof to its original condition; but this serious discovery now renders imperative a complete overhauling of the whole fabric, and it is certain that an entirely new roof will have to be made.

BIRKENHEAD.—The Education Committee have recommended the acceptance of Mr. Peter Rotherwell's tender of £17,306 for the erection of a new school. The sanction of the L.G.B. for a loan of £18,723 is to be asked.

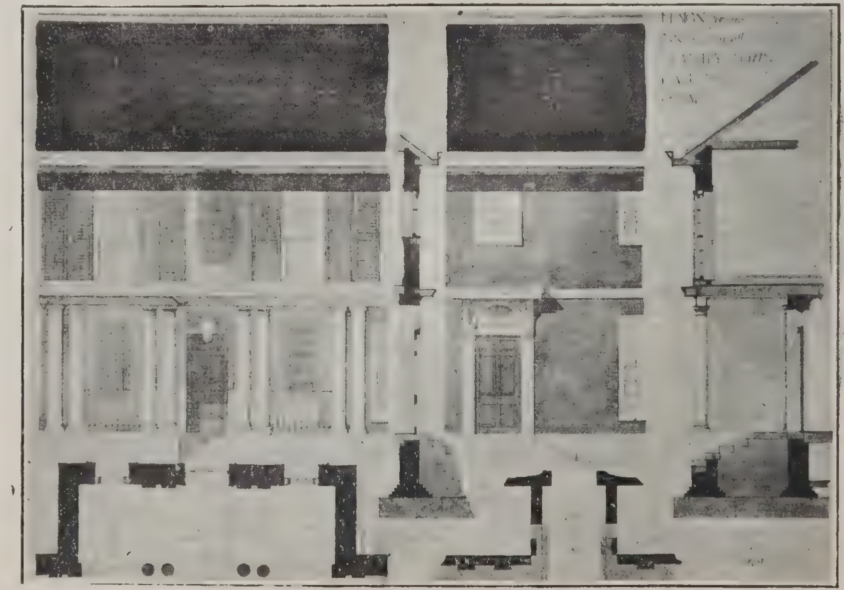
BOURNEMOUTH.—An anonymous gift of something over £3,500 has been received, to defray the entire cost of a new children's ward at the Royal Boscombe and West Hants Hospital.

CROYDON.—A scheme has been under discussion for the widening of North End at a cost of £130,000. This involves the demolition of the Whitgift Hospital which was erected in 1596.

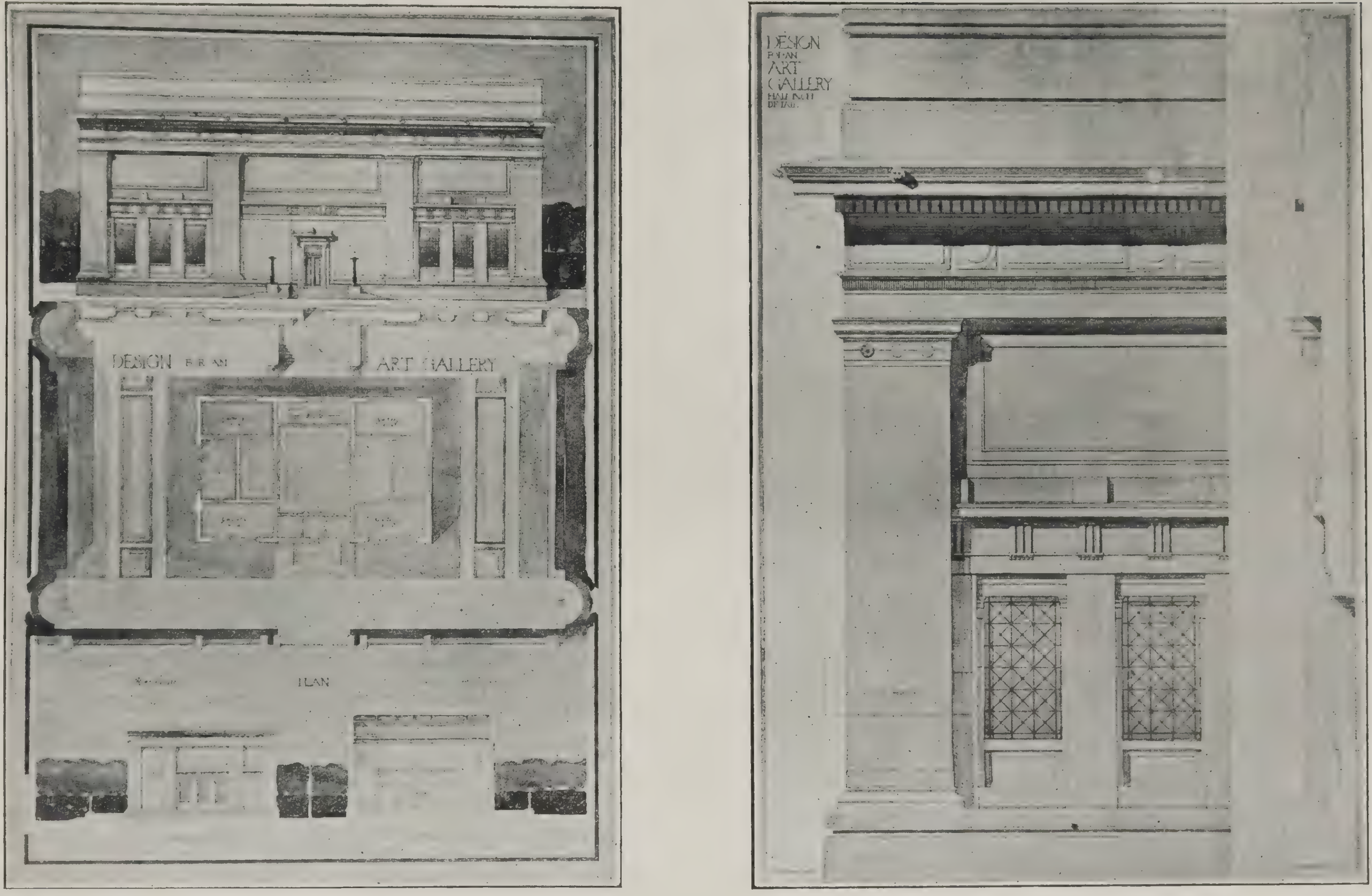
DURHAM.—The following plans have been passed by the Council, with the exception of those sent in by the Aged Miners' Homes Committee, G. Innes, and M. Meehan:—Dwelling-house at High Pittington for Thos. Simpson; alterations to Black Bull Inn, Cassop Colliery, for North-Eastern Breweries, Ltd.; addition to buildings, Sherburn Hospital, for the Governors of Sherburn Hospital; 20 cottages at Ushaw Moor, for the Aged Miners' Homes Committee; 6 dwelling-houses at Auton Stile, for Gabriel Innes; 5 dwelling-houses at Auton Stile, for M. Meehan; 1 dwelling-house at Lowes Barn, for Miss Waite; 2 dwelling-houses at Framwellgate Moor, for B. Binney and R. Davison.

FULWOOD.—A new Wesleyan Church is in contemplation here, to cost about £3,500. The complete scheme, which includes a Sunday school, is estimated to involve a sum of about £6,000. The designs, prepared by Mr. Fred Howorth, of Leyland, were selected recently in competition.

GREENOCK.—The Dean of Guild Court has passed plans for the erection of a new church in Dempster Street. Warrant has also been granted to the School Board to convert the Allan Ker School in Ann Street into an engineering school and laboratory. Permission to erect two tenement buildings in Belville Street has been granted to Messrs. R. Aitkenhead and Sons.



LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE. DESIGN FOR AN INN IN A COUNTRY TOWN, BY SYDNEY H. COLTON. B.A. HONS. STUDENT. FINAL.


DESIGN FOR AN ART GALLERY
PLAN
DESIGN FOR AN ART GALLERY HALF INCH DETAIL.

LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.

DESIGN FOR AN ART GALLERY BY H. A. DOD, B.A. HONS. STUDENT. FINAL.

HEATHFIELD (ESSEX).—A proposal has been made by the Finance Committee that the sanction of the L.G. Board be obtained for borrowing the sum of £2,752, which is estimated to cover the cost of erection and equipping of new school buildings, and the erection of a master's house.

HIGHFIELD.—The Keighley Education Committee are considering the erection of a new mixed school here.

HUNTINGDON.—The L.G. Board has held an inquiry into the proposal of the Hunts County Council to borrow £2,000 for the purchase of a portion of the Cromwell House Estate as a site for county buildings.

LIVERPOOL.—Mr. Andrew Carnegie has promised £19,000 for the erection of two libraries and three reading-rooms upon the Corporation undertaking to find the sites and the cost of maintenance.

LONDON.—The County Council contemplates the erection of 1,081 cottages on the Old Oak Common Lane Estate, Hammersmith, and two schools. Also a further 438 cottages and a school on the Totterdown, Tooting, Estate. 100 cottages are to be built on the Council's Tottenham Estate.

LONDON.—The site for a new fire station at Bow has been purchased, and work will commence in the autumn.

LONDON.—It is proposed to enlarge the Clerkenwell fire station at an estimated cost of between £12,000 and £13,000.

LONDON.—The Southwark Board of Guardians propose to raise a loan of £50,000 to acquire the Bow Infirmary, pressure on their establishments having resulted in overcrowding.

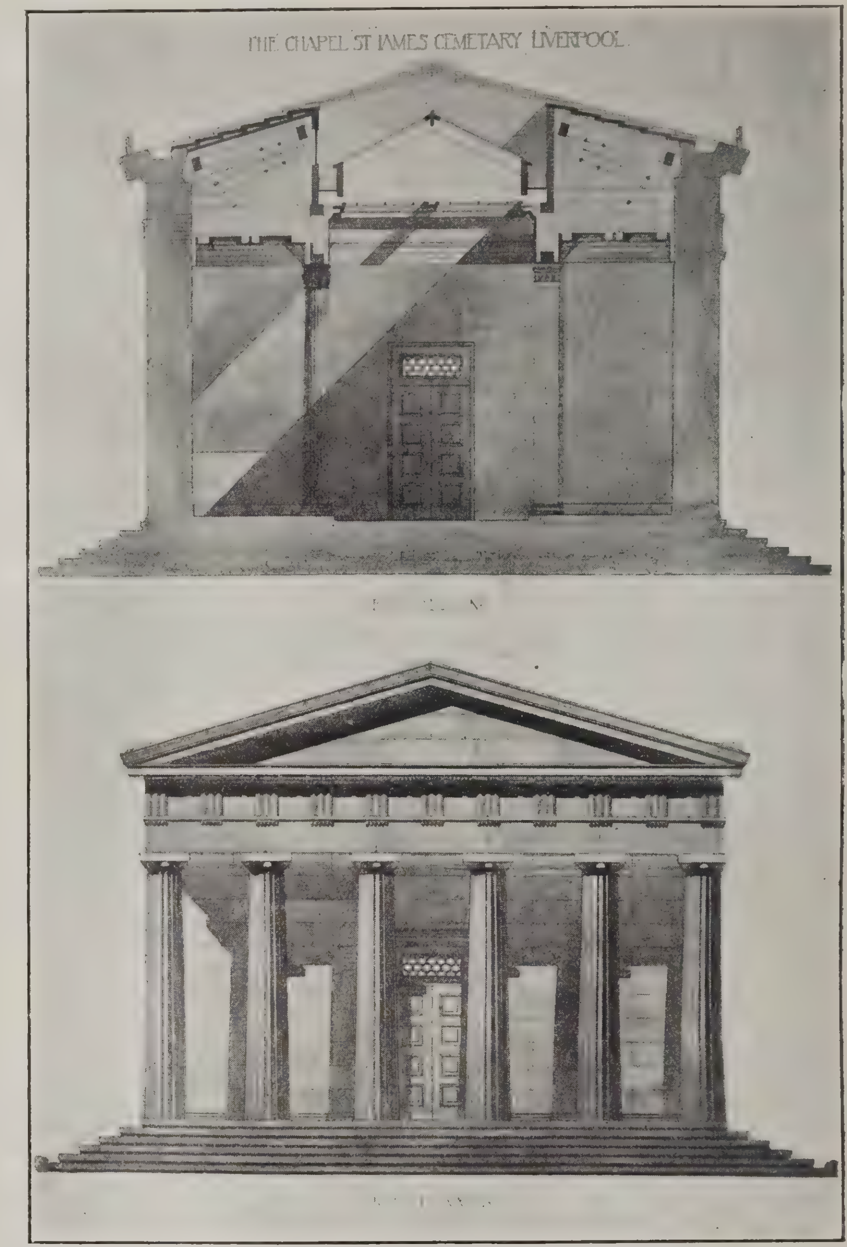
LONDON.—At a meeting of the Middlesex County Council, held at the Guildhall, Westminster, it was agreed to appoint a special committee for the purpose of considering the desirability of altering and improving the present Guildhall, in preference to the erection of an entirely new building, which, including the clearing of the site, was estimated to cost £90,000.

LONDON.—The authorities of Bedford College have applied to the London County Council for a building grant of £20,000 to assist the college in the erection and equipment of new buildings in Regent's Park, at an estimated cost of £100,000. The Education Committee have suggested that the Council should consider the question of making provision for a sum of £5,000 a year for four years, provided that certain conditions are complied with, and that the buildings to be erected in Regent's Park are maintained in perpetuity as a college for the education of women.

LONDON. — The Hackney Borough Council have recommended the passing of plans for building five double-tenement dwelling-houses on the north-east side of Holmbury View, westward from Big Hill, Clapton, on the application of Mr. F. Collins; seventeen dwelling-houses on the western side of Castlewood Road, seventeen dwelling-houses on the eastern side of Moundfield Road, and thirteen dwelling-houses on the western side of Moundfield Road, northward from Ravensdale Road, on the application of Mr. Percy Roche; also one bank, with dwelling-house over same, and twelve shops with residential flats over same, on the eastern side of Stamford Hill, southward from Upper Clapton Road, on the application of Messrs. Edmondson, Ltd.

NEWPORT (MON.).—Objection having been raised to the appointment of an architect to prepare plans for workhouse accommodation, Mr. R. H. Williams, a L.G. Board inspector, urged that Newport should not hesitate when the L.G. Board had given its consent—since the publication of the Poor Law Commissions' report—to the erection of buildings which would cost £60,000 or more. After some discussion, it was resolved to advertise for an architect.

NORWICH.—Towards the extension of the Norfolk and Norwich Hospital, the King has given 250 guineas.



LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.
MEASURED WORK BY E. D. FORSTER FOR FINAL CERTIFICATE.

OBAN.—A warrant has been granted by the Dean of Guild Court, for the execution of alterations and additions at the police station buildings.

PORTSLADE.—The U.D. Council are considering the question of erecting a Town Hall, and of finding a site for it.

TWICKENHAM.—The County Council have decided to recommend that the suggested scheme for the rebuilding of the Guildhall be not adopted; and that the present building be improved and adapted to the requirements of the Council.

TUNSTALL.—The U.D. Council contemplate the erection of a tea pavilion and shelter in the park at a cost of £1,750.

WORTHING.—The West Sussex Education Committee are considering the question of a new secondary school to be erected here.

WEYMOUTH.—The Education Committee of the Town Council are considering sites for a new school for 250 boys.

YARMOUTH.—The Town Council is considering a scheme prepared by the Borough Surveyor for Public Baths. The plans provide for a first-class swimming bath, 100ft. by 34ft., a second-class bath, 75ft. by 26ft., cleansing baths, slipper baths, also Turkish and Russian baths and necessary offices.

At the last meeting of the London County Council it was recommended by the Main Drainage Committee that the tender of Messrs. G. Shellabear and Son, of Plymouth, for the construction of the Southern low-level sewer No. 2, from Deptford to Battersea, at a cost of £473,416, be accepted. Mr. E. G. Easton, the chairman of the committee, however, stated that he had that afternoon received an intimation from the contractors that their tender would be withdrawn, as they were unable to place the order for cast-iron at the price anticipated. He therefore suggested that the Council should adopt the estimate of expenditure on capital account of £487,000 submitted by the Finance Committee, and that fresh tenders be invited immediately after the recess, in order to provide work during the winter. Captain Hemphill said that they were going to commit the Council to giving a contract of nearly half a million to a ring of contractors. They should consider whether the time had not come when they should be masters of the contractors, instead of the latter being the masters of the Council. It was decided by 61 votes to 35 to refer the whole matter back to the committee.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable: and it must be understood that both question and reply will, as a rule, be published in these columns

Buildings to Sketch near Bournemouth.

LEYTONSTONE.—H. L. B. writes: "Could you kindly give me particulars of any old buildings (not later than Perpendicular period) worth visiting and sketching, within, say, six miles of Bournemouth?"

Within the rather limited radius prescribed Christchurch Priory is the only mediæval building of real importance, but this is one of the most interesting in the kingdom and worthy of careful study both as a whole and in detail. Special attention should be given to the exterior of the north transept with its fine Norman turret and arcading, the very large thirteenth-century south porch extensively restored, but still lovely—the original Norman exterior of the eastern chapel of the south transept (best seen from the roof of the choir aisle, where the fine flying buttresses of the choir vault may also be studied), and the bluff Perpendicular east end of the Lady chapel. Internally, the Norman nave, charming 13th century work in the Montacute chantry, late 14th-century choir screen, exceedingly interesting stalls and misereres, fine choir vault and reredos, and the several interesting chapels and chantries afford an abundance of material for study. An excellent guide is published by Messrs. George Bell and Sons, price 1s. 6d. Just outside the limit are Wimborne Minster (sadly restored), Beaulieu Abbey (considerable remains embodied in residence of Lord Montague, and 13th-century refectory now serving as parish church), and further afield are the several interesting village churches in Dorset, around Bere Regis.

G.

Cleaning Cement and Oil off Tiled Floors.

J. M. L. (HARROW) writes: "Can you give me any information as to the best way of cleaning red tile floors from Portland cement particles and also from oil and grease?"

Oil stains may be removed by covering the spots with Fuller's earth ¼in. thick, and putting a hot iron upon the top; an ordinary domestic flat iron heated as if for ironing would be suitable. Heat is necessary, but if excessive it will crack the tiles. Any projecting portions of Portland cement should be carefully chipped off with a sharp cold chisel, then with a little fine sand, water, and red ochre the whole surface may be rubbed over with a piece of red tile about 4 to 6 inches square, dwelling a little longer on the cement stains than on the other parts.

HENRY ADAMS.

Encroachment.

MILFORD HAVEN.—L writes: "The outline sketch (not reproduced) shows the end elevation of a house built on a plot of land leased from an estate company. The walls of the house on this side are built in a direct line with the garden wall and form the boundary of the site. The plans for the house were submitted to the surveyor to the estate, who approved of same. Now the house is built he complains that the fascia board and gutter are fixed overhanging the wall, although fixed tight to it; and threatens either to charge extra ground rent for the strip of ground covered by the gutter, or to take a strip of land 6ins. wide off our boundary on the other side. Is this legal? Can we be forced to alter same? Ought we not to have been notified at the time the plans were approved?

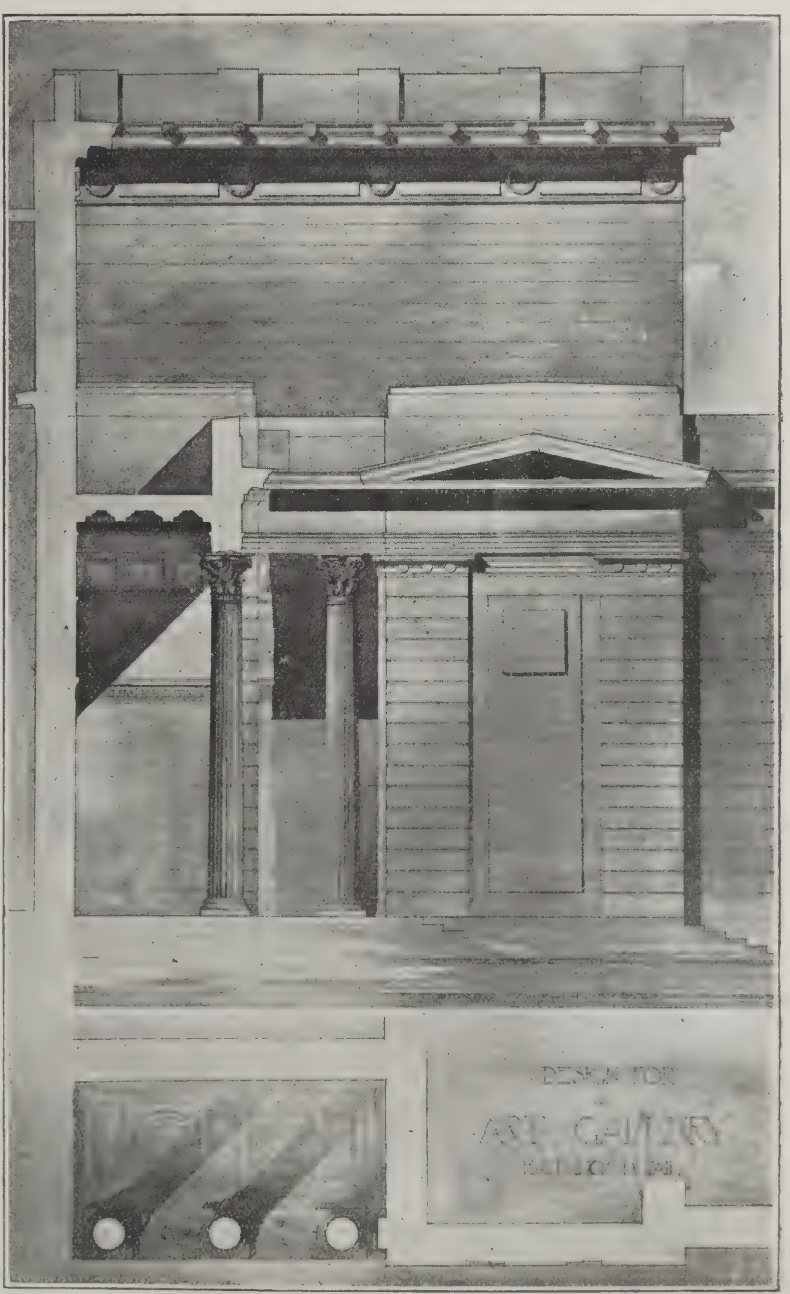
The projection of your fascia board and gutter is of course an encroachment upon the neighbouring property, and the owner of that land possesses the right to call for its removal, or, in default, may remove it himself, or enter an action against you in respect of the damage sustained by reason of the trespass. I advise you to come to terms with the surveyor to the building estate at once, either taking a narrow strip of land to cover your encroachment, or paying a small acknowledgement rental for it. The fact that the plans were submitted and approved has nothing to do with the matter. It was no doubt presumed that you only intended to build on your own land.

F.S.I.

Timber Roof Trusses.

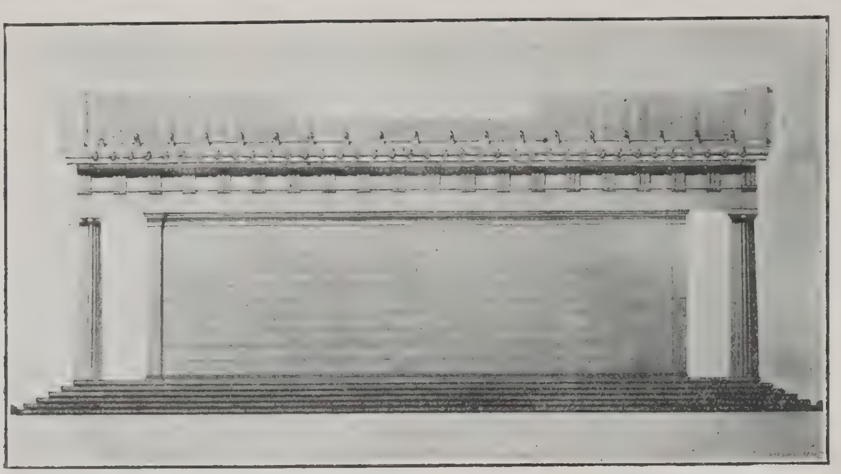
LONDON (DULWICH, S.E.).—F. S. writes:—"With reference to the reply to 'Glasgow—J.W.S.' (see our issue July 7th, p. 9.), I think a very interesting question was asked by the enquirier when he said, 'What is the easiest way to get sizes of the various timbers in the roof truss?' I rather wish that your expert had given a fuller reply to this question as I think the subject is of general interest."

Tables are given in many text-books of the sizes of the timbers of ordinary trusses such as king post, queen post, etc., which with the exercise of a little preliminary knowledge and common sense can be utilised for ascertaining the scantlings of simple trusses of intermediate spans, or of varying distances apart, but the introduction of any irregularity of loading or other special feature at once renders calculation necessary if an economical design of sufficient strength is required. Certainly much constructional work has been done without calculations, and sometimes failure occurs; but frequently the difficulty is overcome by unnecessarily large scantlings being adopted, in which case, although he is probably not aware of the fact,



LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.

E. PRESTWICH. B.A. HONS. STUDENT. INTERMEDIATE.



LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.
MEASURED WORK: MORTUARY CHAPEL, ST. JAMES CEMETERY, LIVERPOOL.
E. D. FORSTER. FINAL CERTIFICATE STUDENT.

the client is paying an increased price for his work for the privilege of employing a man who either cannot or will not make the calculations necessary to arrive at the maximum of efficiency and economy, and for which "professional" services the same commission is paid as though the work were properly designed; or in the alternative the information is sought for (generally under an assumed name and misleading address) in the enquiry columns of the technical papers by the payment of a few pence to cover postage expenses. Happily these form only a small proportion of the querists.

There are general rules observed in settling scantlings, such as that all timbers should be of one thickness if possible, but they would relate more to the appearance than the strength of the truss, and experience forms a good guide, but a very considerable majority of the replies to questions relating to trusses demand the preparation of stress diagrams and calculations in detail; many of them are most complicated and the preparation of the answer may take from a few hours to several days, and obviously this amount of labour would not be incurred if the problems were readily solvable by rough and ready means. Even when the scantlings are correctly ascertained the whole value of the labour may be lost by defective formation of the joints and the greatest care is necessary to ensure safe and sound construction.

HENRY ADAMS.

Bird's-eye View: Duresco.

KINGSTON-ON-THAMES.—NEMO writes: "(1) The enclosed sketch [not reproduced] shows a building estate which has elegant slopes. A 'bird's-eye' view is required which will exhibit these natural slopes to the best advantage. Apart from shading, how is it possible to do this? (2) When using 'Duresco,' or any washable distemper, is it necessary to stipple the surface in order to obliterate brush marks?"

(1) A bird's-eye view gives the least possible chance of clearly indicating slopes in the ground, unless there are horizontal lines, such as eaves of buildings, walls, fences, etc., which can be made by contrast to afford evidence of the sloping nature of the surfaces. If the view in question is taken from the south-west, however, there appears to be no reason why a fairly low horizontal line should not be taken, as the direction of the fall will help to display the extent of the estate. To accurately show the levels, the bird's-eye view should be properly set up in perspective with certain points (probably the corners of the roads) truly plotted as to position in plan and vertical level. If a sufficient number of points are so found, they may be joined up and will give the effect correctly.

(2) It is not usual to stipple the surface of washable distempers to obliterate brush marks, but if the material is properly applied in accordance with the various maker's directions (which differ considerably), these are very inconspicuous.

G.

Length and Thickness of Walls.

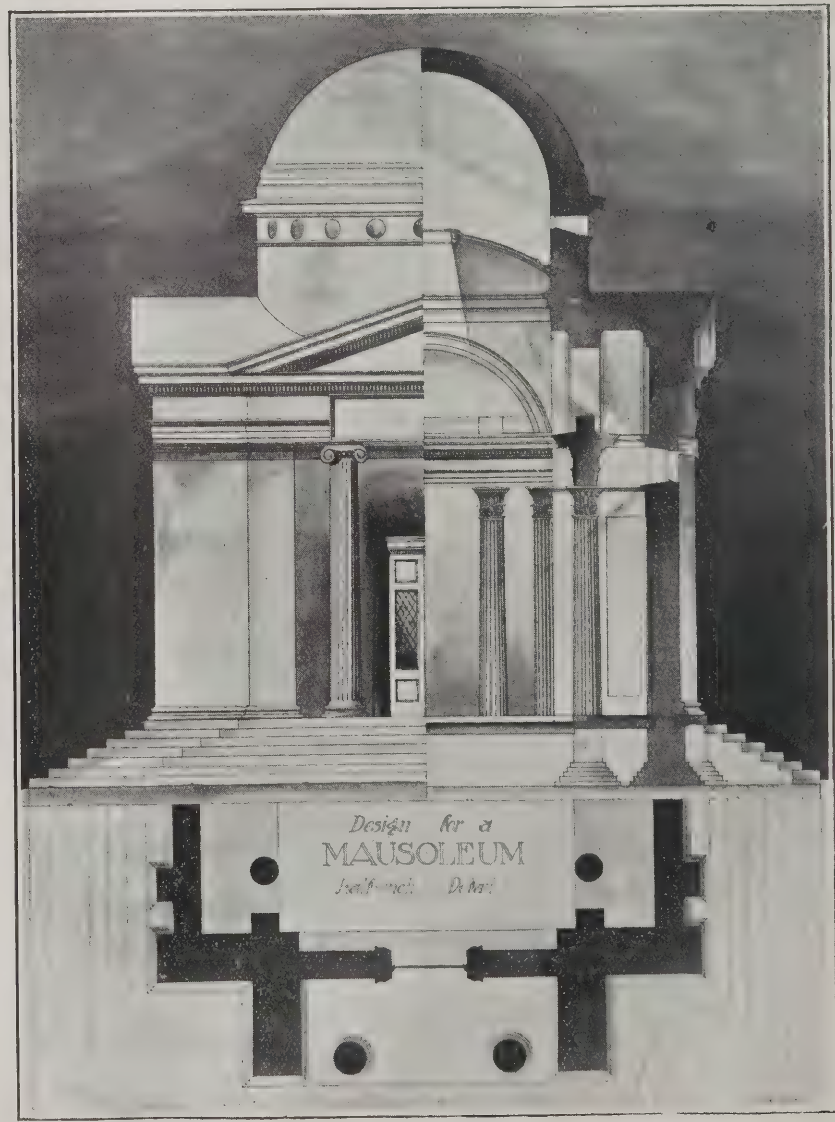
SURBITON.—E. T. writes: "I am about to erect a house, and a question has arisen with the district surveyor as to the definition of lengths of 9in. walls with relation to cross walls. I contend that the entire length of wall is divided into three distinct lengths by the chimney breasts. The surveyor, however, contends that the whole length is one wall only, and that the 4½in. wall must be made 9ins. to comply with the by-law, which prohibits any 9in. wall over 30ft. long without a 9in. cross wall. Your opinion in the matter would be esteemed."

There is no doubt whatever that the surveyor is right in contending that this is a wall of more than 30ft. in length, and that the 4½in. cross wall must be thickened to 9ins. before the building complies with the by-laws. Chimney breasts are not cross walls within the meaning of the Public Health Acts. The only definition of a cross wall of which I am aware is contained in "The London Building Act" of 1894, and I quote it here as being to a certain extent germain to the case:—"The expression 'cross wall' means a wall used or constructed to be used in any part of its height as an inner wall of a building for separation of one part from another part of the building, that building being wholly in, or being constructed or adapted to be wholly in one occupation."

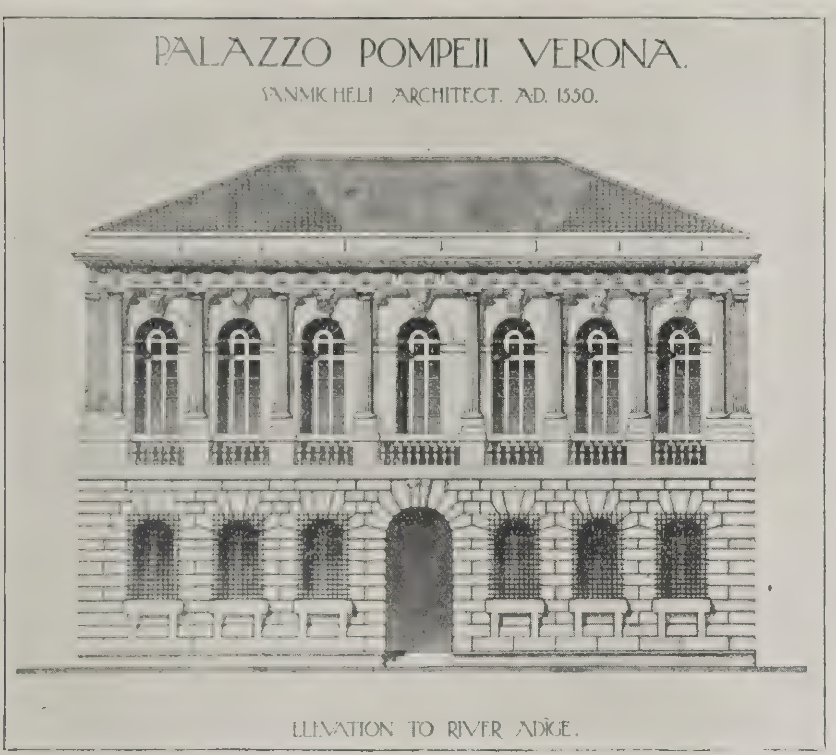
F.S.I.

Drainage of Old Houses.

YORKS.—J. S. R. writes: "A block of property erected about 1870. The local inspector of nuisances has now sent notice to the owner demanding that the undermentioned



LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.
W. A. ALLEN. 1ST. YEAR CERTIFICATE STUDENT.



LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE. MEASURED WORK BY H. J. ROWSE, TRAVELLING SCHOLAR.

alterations should be made at once. (1) All the rain water pipes in the yards, which are now connected direct to drain, should be disconnected and made to discharge over a trapped gulley; (2) all the rain water pipes on the front of the houses which are now connected direct to the drain are to be disconnected from the drain, and are to be connected to pipes or channels fixed in the adjoining footpath and made to discharge in the gutter of the public roadway. Have the Council the right to demand any of these alterations? None of the tenants have complained of any foul stench arising from any of the fall pipes and they are thus not a nuisance. Should the owner be forced to alter then, would not a gulley trap at the front of the house be preferable, instead of closing up the drain and laying 20ft. of pipes or channels in each case to the edge of the footpath? Should the front R.W.P. ever be taken up, and they are found not connected to a drain, but only taken 3 or 4ft. below the ground, or to a very thick bed of gravel and sand upon which these houses are built, then there will be ample drainage for the rain water without causing the site to be damp and unhealthy, and there will not be the stench complained of by the inspector. In these circumstances, can the Council compel the R.W.P.'s to be taken across the footpath to gutter of roadway? Where can I obtain a copy of the "Public Health Act," 1875, and what is the price of same? Have there been any alterations or amendments to it during the last 30 years?"

Were these houses now in course of erection there is no doubt whatever that the sanitary authority could compel the owner to disconnect his rain water pipes from the foul water sewer, but as they are old houses I have grave doubts as to whether it is reasonable upon their inspector's part to call upon the owner now to do so. I am of opinion that the sanitary authority have no power whatever to enforce this alteration of existing drains, unless they can first prove that a nuisance exists (see Section 91 of 1875 Act), and I should advise the owner to resist such a demand, or to leave the whole thing alone and abide the issue. The principal Act is that of 1875, and is a very long one—it may be obtained at any booksellers or from Messrs. Eyre and Spottiswoode, East Harding-street, London, E.C., the price being, I believe, about 7s. 6d. There are several "Amendment Acts" of later date. I know of no cheap text book on this subject.

F.S.I.

Pressure in Water Company's Main.

BRISTOL.—S. writes: "Is it correct that by an Act of Parliament (Public Health Acts, I believe), the pressure in a water company's main, must not exceed 100lbs. per sq. in.? Should a company's pressure considerably exceed this, what is the course to adopt to make them bring it down to the legal limit?"

The Public Health Acts only deal with the regulations for the supply of water within their districts by the local sanitary authority (and not by a company), and provide (by Section 55 of the Public Health Act, 1875), that "the water may be constantly laid on at such pressure as will carry the same to the top storey of the highest dwelling house within the district or part of the district supplied." Water companies are usually constituted each under a special Act of Parliament, and that Act of course constitutes their authority for all their works—besides this, water companies must also conform to the general Acts of Parliament known as "the Waterworks Clauses" Acts. I am not aware of any such direct provision as that mentioned in the enquiry.

F.S.I.

Wall or Fence?

BRISTOL.—H. H. J. writes: "I am about to build in the suburbs a small cottage of the value of about £200. The boundary walls, being about 300ft. in circumference promise to be rather an expensive item if of a permanent character, so I thought of erecting an open timber fence filled in with wire mesh and training a hedge up same. I should be glad if you would kindly get one of your experts to explain the usual method of doing this, or any other effective method, and price of same."

The brick wall, though its first cost may be greater, will, in the end, probably turn out much cheaper than any substitute. Do the "building regulations" of your purchase allow such a fence as you suggest? A wire fence may be constructed as follows:—Strain a 7 ply galvanized fencing wire along the top and bottom by means of posts at the ends and intermediate supporting stumps. Cost of 7 ply 4 gauge wire (containing about 305yds. run per cwt.) is about 16s. 6d. per cwt. Then attach your galvanized iron netting to this by means of thin lacing wire, cost 3d. per lb., threaded round and round at every mesh, and bury into the ground about 6 inches of the netting at the bottom. The cost of the netting will vary widely according to the mesh you employ; sheep netting of 14 gauge 4in. mesh and 42in. width being about 12s. 10d. per roll of 50yds., whilst rabbit netting of the same width, but with 1¼in. mesh and 17 gauge is 18s. 6d. per roll. "Lock woven" steel wire fencing may be employed (without the straining wire), but it is of course more expensive.

F.S.I.

Graphic Solution of Semi-circular Domes.

"Glasgow" will find in the R.I.B.A. Journal of 21st May, 1904, and in Vol. 23 (1908) of the Architectural Review two excellent papers by Mr. Dunn, which will afford him considerable information on the graphic solution of dome stresses.

PERCY J. WALDRAM.

Plague of Snails and Slugs.

HALIFAX.—PUZZLED writes: "Can any cure be recommended for a pest of snails and slugs inside a dwelling-house? Great care has been used in examining walls and having holes pointed, but still they infest the house, both cellars and ground floor. The house is an end one in a block of five, and the gable abuts upon a field, but without opening on that side."

Having dealt with a similar difficulty, we should imagine that the soil under the house is perpetually damp. In the case in question the house, a small, speculative built one, was one in a terrace, and situated half-way up a slight slope, and without cellars. Very little trouble had been taken in levelling the ground at the front and back of the house, with the result that the soil was above the dampcourse in places, and at the back the tar-paved yard was above the level of the back sitting-room floor, and out of level, so that pools collected in rainy weather. It was in this room and in the kitchen that slugs were especially troublesome. They also appeared in a cupboard under the stairs, which cupboard opened into the kitchen. A close examination of the floor and skirtings in the back sitting-room failed to reveal any cracks through which the slugs could penetrate. The first thing done was to lower the level of the ground back and front, to put in a land drain to take any ground water from under the yard round the end of the back addition and down the slope. While this was being done local gossip reported that a small pond or dyke had formerly occupied part of the site of these houses, and that it had been filled in when the houses were built. Accordingly, the back sitting-room floor was pulled up, and the soil under was found to be quite moist. A considerable number of large slugs were found. These appeared to have made their exit into the yard, through an airbrick which was below the yard level, and up a crack between the tar paving and the wall. Their entrance into the back sitting-room was up a small crevice by the grate. The land drain was accordingly continued under the back sitting-room. The soil under this room was then covered with 4ins. of concrete graded to an outlet through the wall into the yard. The yard was then relaid in Portland cement concrete, graded to fall away from the house, a gutter was formed along the fence to take the water which during rain usually poured in from the next yard above, and a gulley put in to take the yard water. A cement plinth was also put up round the back addition, and under the back sitting-room window. It is needless to say that these radical measures were only taken after all other means had failed, and they have proved quite effectual. We fear if the soil under or round the house is perpetually damp, nothing short of eliminating the dampness will be satisfactory. Perhaps this experience may suggest something to our correspondent; or, if readers have any other remedies we shall be pleased to give publicity to them.

Our Plate.

Suggestion for the Development of the George's Dock Site, Liverpool.

The drawing shows an endeavour to provide a worthy architectural group of buildings and a satisfactory setting for these by so arranging the approaches to the landing-stage, etc., that a harmonious composition may be the result. The main part of the scheme shows a large building between the new offices of the Mersey Dock and Harbour Board and those of the Royal Liver Friendly Society, at present being erected, and the chief difficulty in designing this centre block was to harmonize and in no way detract from both these fine buildings.

This has been done by having a lower building in the front, forming a link between the two higher blocks, all grouping together and leading up to the highest building in the rear, which would be over 300ft. in height, dominating the whole group without in any way dwarfing them, and forming a magnificent landmark at this unique position. The lower building has been planned for a large public company, shipping offices, or exchange, and the great depth of the old dock has been utilised by arranging for a complete bathing establishment arranged on the most modern and luxurious lines, with large swimming bath lined with marble, and Turkish, electric, and other baths. The higher building in the rear is planned as a modern hotel, completely provided with all the modern requirements for a great caravanserai to meet the wants of the Transatlantic and other passenger continually arriving at the adjacent landing stage. On the roof, commanding a magnificent view over an open air café chantant, salle de fêtes, restaurant, etc., are arranged, with express lifts from the basement. Moving stairways and luggage lifts are arranged from the landing stage, the luggage to the hotel running directly through tubes from the stage to the hotel basement. Along the river front, above the great floating landing stage, a colonnaded promenade is designed to form a magnificent standpoint from which to see the great shipping activity of the city, and the unbroken line of the parapets and colonnade forming a fine base to the buildings in the rear when seen from the river.

Underneath this promenade would be found ample space for parcel offices, waiting- rooms, restaurants, etc. At the near or northern end an arch is thrown over the floating gangway, under which would pass the enormous traffic through this artery of Liverpool. The space in front of the building is planned with ornamental grounds, groups of statuary, etc. The designers of this scheme are Messrs. J. M. Porter and Elcock, of Colwyn Bay, and their idea seems well worthy of the consideration of the Liverpool authorities.

House at Thames Ditton.

This house is being built at Thames Ditton for A. Jacob, Esq., and is now nearing completion. It stands on a beautiful site overlooking the River Thames and Home Park, and forms part of the old pleasure garden to the historical house of Boyle Farm. It is entirely built of local red sand-faced bricks, and is roofed with dark, hand-made tiles of varying colour. Leaded lights and iron casements are used throughout in heavy wood frames. The billiard-room and music-room are two large rooms, which can be thrown into one by means of sliding doors, and a feature is made of the hall and staircase, which is in oak and heavily beamed, the ingle fireplace here being in small dutch bricks and tiles, surmounted by an oak beam and a deeply-carved panel, with figures in full relief. The principal rooms overlook the river, and the dining-room and hall open on to a verandah. A motor-house is attached, designed in harmony with the house. The architect is Mr. A. Jessop Hardwick, F.R.I.B.A., of Eagle Chambers, Kingston-on-Thames, and the contractor, Mr. E. Potterton, of East Molesey. Casements and leaded lights are by Messrs. Geo. Wragge, Ltd., of London and Salford, and internal fittings are by Messrs. Thos. Brawn, and Co.

In Parliament.

By our Gallery Representative.

Ancient Monuments in Ireland.

Mr. Ginnell asked the Chief Secretary for Ireland if he would ask the Estates Commissioners to instruct their inspectors not to wantonly lay down any line of fence or road so as to mutilate or destroy any rath or any other ancient monument, historic or prehistoric, whether registered or not.

The Attorney-General for Ireland (Mr. Cherry) said the Estates Commissioners and their inspectors were fully alive to the importance of preserving ancient monuments. The Commissioners did not consider that there was any necessity for the issue of instructions such as were suggested in the question.

Duke of York's School.

Mr. Haldane, the Secretary of State for War, has informed Mr. Hart-Davies that no decision has yet been come to as to the future of the Chelsea site of the Duke of York's School.

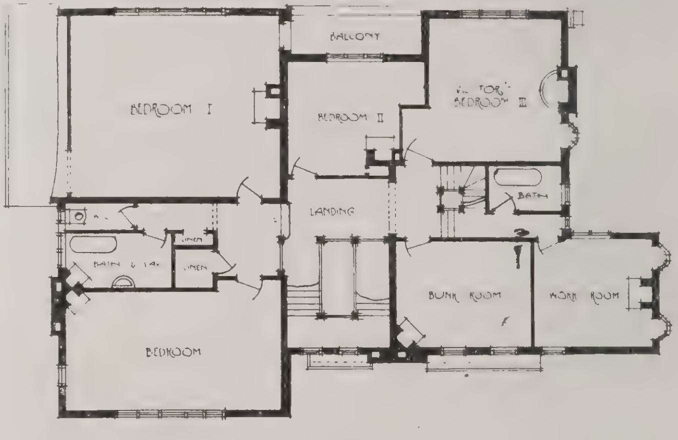
Victoria and Albert Museum.

Mr. Harcourt stated in answer to another question by Mr. George Gibbs that the total cost of the erection of the Victoria and Albert Museum, the funds for which were provided by the Public Buildings Expenses Act amounted up to 31st March last to £512,228, of which £194,488 represented the payments during the past three financial years. On furniture and equipment the sum spent in the same period was £2,533. Considerable sums were yet due to the contractors especially in connection with furnishing.

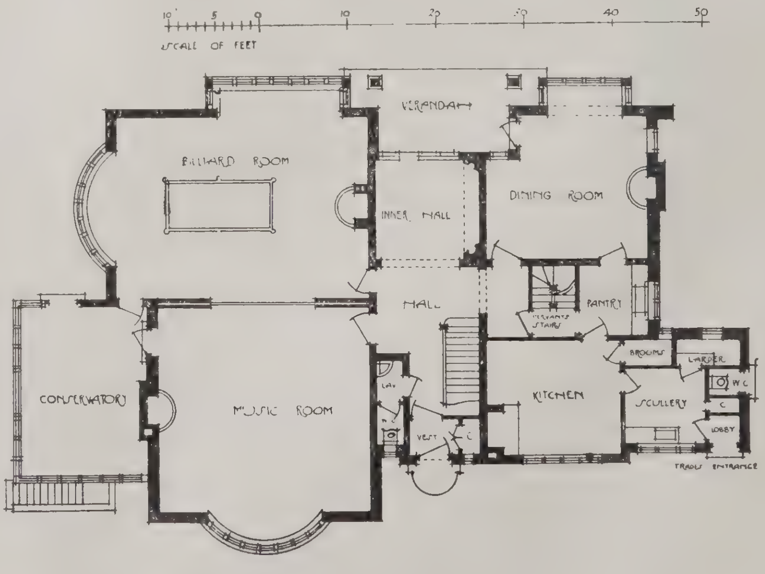
Societies and Institutions.

The Concrete Institute.

The Concrete Institute, of which the Earl of Plymouth, C.B., is President, and which has now over 750 members, celebrated its first anniversary on Thursday, July 22nd, by a visit to one of the largest Portland cement works in Europe, i.e., the Swanscombe branch of the Associated Portland Cement Manufacturers, Ltd., near Gravesend, better known as the J. B. White Bros' branch. About 100 members of the Institute attended this visit, and among the party were Mr. Edwin O. Sachs, F.R.S.Ed. (chairman), Mr. E. P. Wells, J.P. (hon. treasurer), Mr. C. H. Colson, M.Inst.C.E. (Admiralty), Mr. W T. Hatch, M.Inst.C.E. (Met. Asylums Board), Mr. W. G. Kirkcaldy, Assoc.M.Inst.C.E., and Mr. George Corderoy, F.S.I. The visitors were met at Cannon Street Station at 10.30 a.m. by the Chairman of the Associated Portland Cement Manufacturers, Ltd. (Mr. F. A. White), and by Mr. H. H. D. Anderson, Mr. Herbert Brooks, J.P., Mr. H. K. G. Bamber, F.C.S., Mr. Alfred Stevens and other directors, and were taken in saloon carriages to Northfleet, where they were entertained to luncheon at the Factory Club. They were then driven by special trams to the Swanscombe Works, which contain the largest installation of rotary kilns in this hemisphere. The output by this plant alone

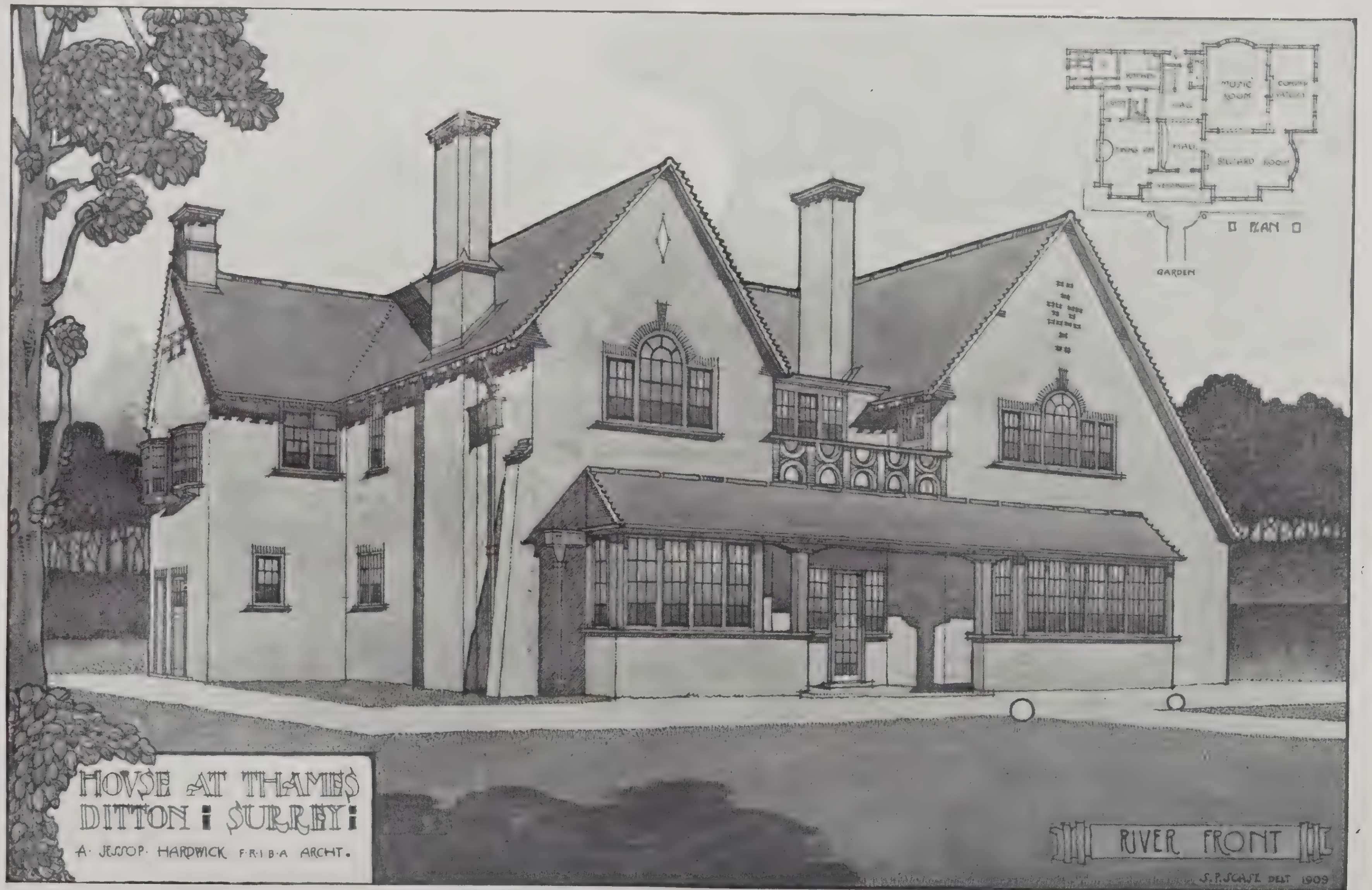


FIRST FLOOR PLAN



GROUND FLOOR PLAN

HOUSE AT THAMES DITTON. SURREY. A. JESSOP HARDWICK. F.R.I.B.A. ARCHITECT.
(See Centre Plate.)

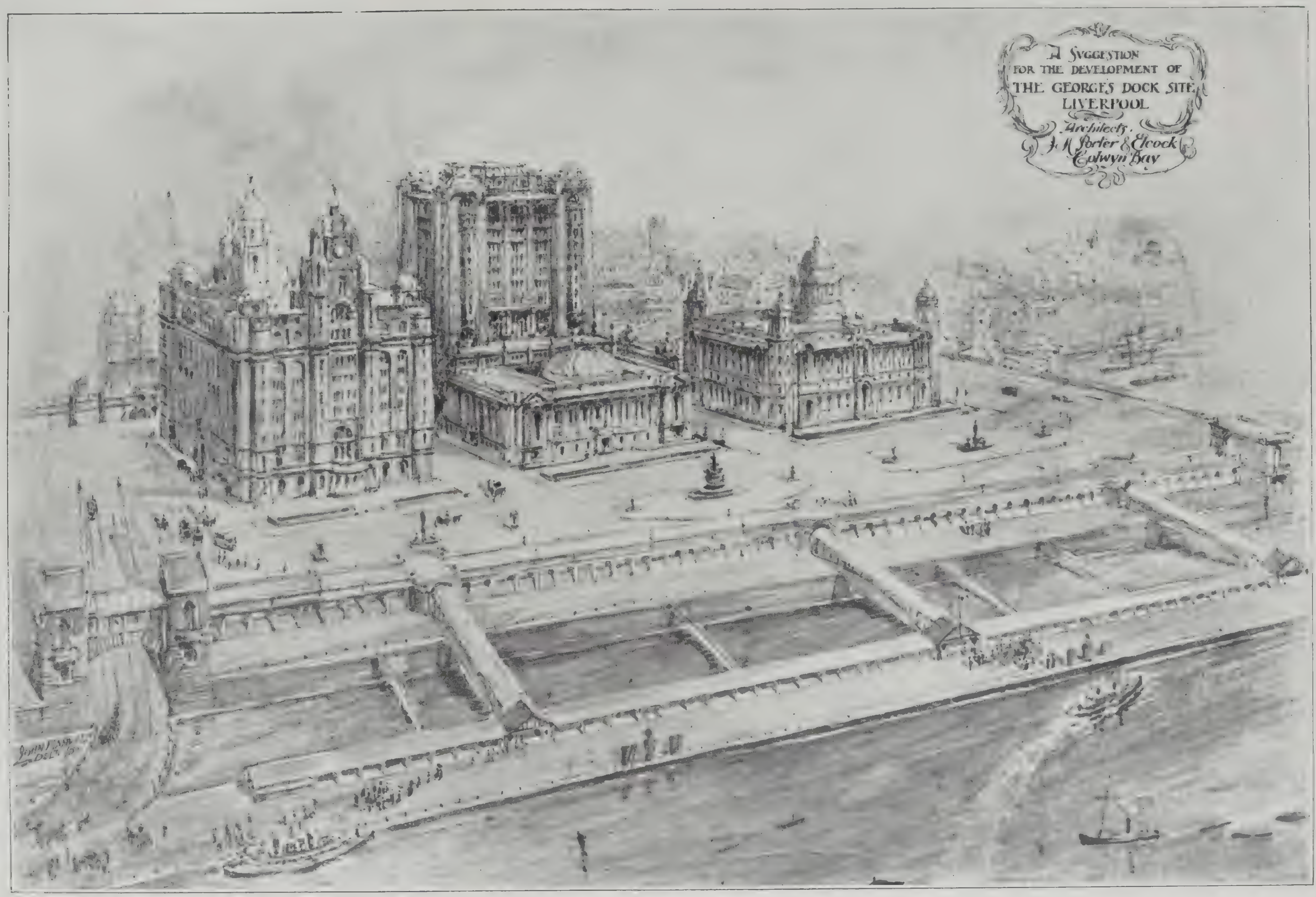


HOUSE AT THAMES DITTON : SURREY :

A. JESSOP. HARDWICK F.R.I.B.A ARCHT.

RIVER FRONT

S. P. SCASE DELT 1909


A SUGGESTION
FOR THE DEVELOPMENT OF
THE GEORGES DOCK SITE
LIVERPOOL
Architects.
J. M. Porter & Elcock
Colwyn Bay

exceeds 600,000 tons per annum. The visitors went over the works in eight groups, each group being under a technical guide and a director of the company, and so a most thorough and instructive inspection was insured. Afterwards the visitors were entertained to tea, and they reached London again by 7 p.m. Mr. White, in welcoming the party, dwelt on the rapid development of the Concrete Institute into one of the most important institutions. Mr. Sachs in his reply commented on the broadminded policy of the company in including in their invitation such members of the Institute as happen to be directors or chemists to competing cement works. This policy, he pointed out, made for a greater efficiency in the whole of the nation's Portland cement output, a factor of importance in such a great industry as that of the Portland cement trade. He also remarked on the danger resultant from the keen competition in the selling price of Portland cement, as the building owner really buys the material almost at cost price (few indeed of the cement makers paying anything more than an interest on their preference capital, if as much as that). The rivalry of cheapness allows large manufacturers to keep up their quality, but makes it extremely difficult for the small manufacturer to follow suit. As a matter of fact, he considered the price of Portland cement unnecessarily cheap. There was no reason why the price should not be a little higher, for one shilling per ton made but an infinitesimal difference in the cost of a £25,000 building. Among others who spoke on the occasion to thank the hosts for their reception were Mr. C. H. Colson, M.Inst.C.E. (Admiralty), and Mr. Munro (Stuart's Granolithic Co.), and among those who replied for the directors were Mr. Bamber, F.C.S.

Royal Sanitary Institute.

The Royal Sanitary Institute have appointed Prof. Henry Adams, M.Inst.C.E., F.S.I., Dr. Louis C. Parkes, M.D., D.P.H., Prof. W. Napier Shaw, D.Sc., M.A., F.R.S., and Mr. A. Saxon Snell, F.R.I.B.A., as the adjudicators for the next "Henry Saxon Snell Prize" Competition, the subject set being: "The Principles of Heating and Ventilating Public Buildings." The essays have to be delivered at the Institute, 90, Buckingham Palace Road, by the 31st August.

R.I.B.A.

The results of the summer examinations have now been declared. The preliminary examination for probationers resulted in 156 candidates being admitted of whom 52 were exempted candidates. For the intermediate examination qualifying for registration as student, 144 candidates were examined and 65 passed, three others being exempted from this examination. For the final and special, qualifying for candidature as A.R.I.B.A., 132 candidates were examined and the following passed: P. T. Adams, London, W.C.; H. C. Anderson, Heywood, Lancs.; Wm. C. Autcliffe, Fulham; B. V. Bartholomew, Walthamstow; W. Bell, Dundee; A. Binning, Blackheath; H. Boddington, jun., London, S.W.; A. H. Boss, Victoria Park; F. H. Brazier, Hale; C. Bristow, West Norwood; W. J. Brough, Finsbury Park; P. Caminesky, Maidenhead; H. Carnelley, Hampstead; C. D. Carus-Wilson, Sevenoaks; W. D. Cathcart, London, W.; G. S. Cockrill, Gorleston; H. C. Constantine, London, W.C.; V. C. Cook, Wolverhampton; C. R. Corfield, Edgbaston; J. L. P. Dahl, South Hampstead; W. F. Dickinson, London, S.W.; E. J. Dod, Liverpool; A. L. Edwards, Wimbledon; A. N. Edwards, Leicester; J. S. Ferrier, Edinburgh; G. E. Fitzgerald, Bedford Park; H. S. Fleming, Erith; *C. A. Geen, Lewisham; R. F. Gutteridge, Southampton; F. W. Hagell, Whitehall Park; D. Harvey, Hull; A. G. Henderson, Glasgow; R. Hotz, Wandsworth Common; J. W. Jarvis, Harrow; J. M. Jenkinson, Sheffield; W. Kanla, Earls Court; *H. Kenchington, London, W.C.; W. H. Ludlow, Clapham Common; *T. Y. Lusk, London, N.; A. J. C. McLean, Brighton; C. S. Madeley, Birmingham; *J. T. Mair, Wellington, N.Z.; F. J. M. Maxwell, Bedford Park; W. L. Mellor, Manchester; C. B. Metcalf, Bradford; *G. A. Mitchell, Acton; H. W. Mole, Newcastle-on-Tyne; E. E. Morgan, Crouch End; *H. S. Morris, London, S.W.; *R. H. Nicholson, Sunderland; R. Orr, Poole; E. S. Petch, Scarborough; H. M. Pett, Brighton; R. Pett, London, W.; W. S. Purchon, Sheffield; S. H. Rainforth, Ravenscourt Park; C. H. Rose, Wimbledon; H. A. Ross, Shepherd's Bush; H. S. Sawyer, Bromley, Kent; H. E. Seccombe, Weybridge; J. Seddon, London, W.C.; H. P. Shapland, Canonbury; C. H. Simpson, Putney; *F. R. Smith, Acton; D. W. Stewart, Tottenham; W. W. Tasker, Jesmond; A. Turnbull, Sunderland; H. Unwin, Wigan; G. Vey, jun., Chiswick; *H. Waler, London, W.C.; H. G. Warlow, Sheffield; J. D. D. Watt, Falkirk; G. H. Williams, Windsor; J. B. Wills, Highbury; G. C. Wingrove, Newcastle-on-Tyne; J. G. Young, Alloa.

(* Special Examination.)

The Institution of Municipal Engineers.—Annual General Meeting.

The first annual general meeting of the institution, of which Mr. John T. Pegge, city engineer and surveyor of Durham, is president, will be held at the Town Hall, Durham, on Saturday, August 7, 1909. The official programme is as follows:—At 11 a.m., the members will be received at the Town Hall by His Worship the Mayor of Durham (J. T. Boyd, Esq.). Presentation of annual report of the Council. 12 a.m.: Discussion of paper, "The Design and Requirements of Electric Power Works," by Horace Boot, M.I.E.E., A.M.I.Mech.E., which was presented at the general meeting held at Olympia on April 24th last. 1 p.m.: Lunch. 2 p.m.: Paper, "Municipal History and Works of a Small City," by the President of the Institution, followed by discussion. 3 p.m.: Paper, "The Durham Main Sewerage Works," by Harry W. Taylor, Assoc. M.Inst.C.E., of Messrs. Taylor, Wallin and Taylor, consulting engineers to the scheme. 4.30 p.m.: Visit to Durham Castle and Cathedral. At the conclusion of the meeting the result of the ballot for election of the Council for the year 1909-10 will be announced.

At a meeting of the Bolton Board of Guardians on the 21st ultimo, it was stated that letters had been received regarding the fair wages clause, and firms whose tenders had been accepted by the Board for work at the workhouse. The clerk explained that the letters were from the Bolton branches of the National Amalgamated Furnishing Trades' Association, and the National Amalgamated Society of Operative House and Ship Painters and Decorators. Both letters stated that the fair wages clause had been violated by certain firms. The second-named society complained that the firm they wrote about were not on the recognised "fair list," and the majority of the men employed were brought from other towns. That debarred local painters from getting a share of work, which in the society's opinion should be done by local men. They requested the tenders to be reconsidered.—Ald. Haslam said the question was not as to what the societies recognised, but whether the firms were paying the standard rate of wages.—The clerk pointed out that the attention of the two firms was drawn to the clause, and both agreed to it before signing.—After further discussion the clerk said he had drafted two letters which, with the permission of the board, he read. These stated that the firms entered into the contract making it a "condition that they pay all workpeople in their employ the regular standard rate of wages as recognised by the various trade unions and employers' associations." The letters asked, in conclusion, that the two complaining societies state in what particulars, and how, the fair wages clause had been violated. It was resolved that the letters be sent to each of the societies.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Aug. 30	FOREST HALL, Elementary school for 250 scholars. County of Northumberland Education Committee invite designs from architects practising in the County and in the City and County of Newcastle-on-Tyne. Particulars, conditions and plan of site from C. Williams, Secretary to the Education Committee, The Moot-hall, Newcastle-on-Tyne.
Aug. 31	HUDDERSFIELD NEW CHURCH. Plans are invited for a church to seat 400, to cost about £2,000, not to exceed £2,500, with all fittings, furnishings, lighting and heating apparatus. Plans to be forwarded to the Rev. D. Macræ Tod, B.D., St. James' Manse, Huddersfield, by Aug. 31.
Sept. 1	BRANCH LIBRARY, NEW CROSS, for Deptford Borough Council. Limited to Architects practising in the City or the County of London. Assessor: J. S. Gibson, Vice Pres. R.I.B.A. Premiums, £52 10s., £26 5s., and £10 10s., for three selected designs, and will be awarded in accordance with the conditions contained in the instructions to competitors. Site plan and copy of instruction from Vivian Orchard, Town Hall, New Cross Road, S.E. Deposit £1 1s., refunded on receipt of *bona fide* design or if instructions are returned within 21 days.
Sept. 20	HULL TRAINING COLLEGE for teachers in Elementary Schools. The Education Committee invites Architects to submit designs. Premiums of £150, £100, and £50 to authors of the designs placed 1st, 2nd and 3rd respectively. Particulars and plan of site may be obtained of J. T. Riley, Secretary of Education, Albion St., Hull. Deposit, One Guinea, returnable on receipt of *bona fide* design, or the return of particulars within 14 days.
Oct. 1.	ABERDARE HOSPITAL. The Aberdare Urban District Council invite competitive designs for a fever hospital for 52 patients, including administrative block, outbuildings, etc. Premiums of £100, £50, and £25 for the designs placed first, second, and third respectively. An Architectural Assessor will be appointed on the nomination of the President of the Royal Institute of British Architects: also a Medical Assessor to act jointly. Particulars and conditions of the competition, together with a plan of the site, may be obtained from T. Phillips, clerk, Town Hall, Aberdare, on deposit of £3 3s.

An important work on cement, its manufacture, testing and uses, by A. C. Davis, F.C.S., Assoc.Inst.C.E., managing-director of the Saxon Portland Cement Co., Ltd., has just been published by Messrs. Woodford Fawcett and Co., 36, 38, Southampton Street, Strand, W.C.

* * *

We have received the "Annuary of the American Institute of Architects for 1909," which gives the lists of officers, committees, Fellows, Associates, etc., of that society.

* * *

Concern has been caused in Enfield by a report of a Local Government Board inspector (Dr. S. W. Wheater), who held an inquiry into matters affecting the health of the district and the administration of the District Council. He states that the condition of a large proportion of the older houses illustrates the evil results of uncontrolled speculative building. Hundreds of houses are composed of sandy bricks, which are crumbling away, and absorb and hold the damp and moisture. Damp-courses are either absent altogether or too low to prevent dampness of the walls. Roofs are improperly laid, and air space and lighting are inefficient and defective. The report contains many other severe criticisms concerning sanitary and hygenic conditions.

BRITISH FIRE PREVENTION COMMITTEE.

The British Fire Prevention Committee concluded its summer session with two series of testing operations, one relating to the all-important subject of the possibility of making flannelette permanently non-inflammable, and the other relating to types of chemical fire extinguishers in which the necessary force is obtainable by the external application of small chemical charges easily open to inspection. The tests were conducted in accordance with the usual procedure of the British Fire Prevention Committee and the members were received by Mr. Edwin O. Sachs, F.R.S.Ed., (chairman), Sir James Williamson, C.B., Mr. W. T. Hatch, M.Inst.C.E., and other members of Council, and there were present among others Lord Londesborough (president of the Firemen's Widows' and Orphans' Fund); Sir Horatio H. Shephard, M.A., LL.D.; Mr. J. F. Moylan (Home Office); Mr. Ollis (Chief Officer Public Control Department of the L.C.C.); Mr. S. Gamble, F.S.I., Lieutenant Sladen, R.N., Mr. Dyer, of the London Fire Brigade, and a number of officials from the various Government and Municipal Departments concerned. The tests with the extinguishers were conducted by a sub-committee, of which Mr. Percy Collins, J.P., was the directing member. The flannelette tests were conducted by a sub-committee, of which Mr. Ellis Marsland (district Surveyor) was the directing member. Among the members of the sub-committee assisting were Mr. J. Herbert Dyer and Mr. Horace Folker (vice-presidents of the National Fire Brigades' Union), Mr. E. J. A. Fulkes and Mr. Bertram Chatterton (insurance surveyors). The flannelette tests were a series dealing with 150 different specimens of material of different makes, treated and untreated, and washed and ironed for a varying number of times up to 20 times. The usual official illustrated reports will be issued shortly by the committee dealing with the results of the tests.

Fire Prevention Notes.

Tests of Fireproof Doors. The tests held on February 24th last by the British Fire Prevention Committee have been officially reported upon as follows:—The object of the test was to record the effect of a fire of four hours' duration at a temperature gradually increasing to about 2,000 F.° (1093.3 C.°), followed by the application of water for five minutes on the fire side with a view of being classified as affording "full protection" (Class B.). Note.—The door openings were to be approximately 3ft. 3ins. wide and 6ft. 9ins. high (.990m. by 2.057m.). The fire was to be applied from one side and the doors were to open inwards on to the fire side. In the case of the "armoured door," the essential requirements of the Fire Offices Committee were to be complied with.

The Armoured Door.

In 34 minutes flame appeared at the top corner of the door on the south side, which gradually increased, until at the end of the test it had spread along the top and down the north side. The door was away from the brickowrk along the top at the conclusion of the test about 1in. (0.25m.). The maximum reading of the hanging thermometer in front of the door was 58° Fahr. (14.4 C.) at 120 minutes and 130° Fahr. (54.4 C.°) at 240 minutes. The paper attached to the post in front of the lower part of the door did not take fire. The effect of the application of water to the inside face of the door was to destroy the external tinned plates on the inside face, and to wash out the wood interior which was carbonised. The outer plates of the door remained in position. Both fire and water passed through the door. Classification was not obtained.

The Iron Door.

In five minutes the door was too hot to hold the hand over. The radiated heat increased so that in 80 minutes the paper on the post in front of the lower part of the door took fire. The maximum reading of the hanging thermometer in front of the door was 220° Fahr. (104.4 C.) at 120 minutes, and 180° Fahr. (103.3 C.) at 240 minutes. In 152 minutes the door was at a dull red heat all over. At the conclusion of the test it was at a bright red heat in all but the lower 18ins. (.457m.). The door bulged inwards during the test about 1in. (.025m.), and on the application of water the bulging increased. Flame did not pass through the door, or between the door and frame. Some water passed through the space between the door and frame where buckled. Classification was not obtained.

"Checkfire" Doors.

The objects of the test were here the same, but the door openings were to be approximately 2ft. 9ins. wide and 6ft. 5ins. high (.838m. by 1.956m.).

Door A.

In 80 minutes the top north corner of door commenced to buckle inwards and continued to do so till the end of the test, when a maximum of 1½ins. (.038m.) was recorded. Buckling also occurred down the north and south sides during the test. In 164 minutes flame appeared over top of door at north corner. In 215 minutes flame appeared through edge of door on south side between lock and sill. The maximum reading of the hanging thermometer in front of the door did not exceed 80° Fahr. (26.6C.). The paper attached to the post in front of the lower part of the door did not take fire. Water passed between door and frame. Classification was not obtained.

Door B.

In 110 minutes the bottom and top corners of the door on the north side buckled outwards, the maximum at the top after 215 minutes being 1⅛ins. (.28m.). In 210 minutes flame came over the top corner of door on the north side, and in 234 minutes flame appeared below the lock between the edge of door and brickwork. The maximum reading of the hanging thermometer in front of the door did not exceed 72° Fahr. (22.2C.), The paper attached to the post in front of the lower part of door did not take fire. On water being applied to the inner face of the door, the door contracted almost to its original position in the rebate, and buckling mentioned above was not visible. Water passed freely over top and under bottom of door. Classification was not obtained.

The "Checkfire" Door Co. point out that it is seen from this report that their doors have thus established a record for fire resistance, the weaker of the two being fourteen minutes better than the previous best recorded time.

Fireproof Construction Needed. In a recent issue "The North American Review" published a strong plea for fireproof construction in an able article by Mr. Louis Windmuller. The author points out the almost criminal disregard by Americans of the precautions adopted in other countries, a carelessness resulting in an annual loss of a quarter of a million dollars through fire. "Dangers Lurking in Woodpiles," is the title of the article, and that many of our structures are merely woodpiles is shown by the conflagrations that occur. On the subject of fireproofing construction, Mr. Windmuller comments in part as follows:—"When we turn to large buildings in large cities we find many skyscrapers from fifteen to twenty-five stories high, which consist of steel frames filled with concrete, and covered by an outside curtain of stone; they are erected in the most approved manner within twelve months from the laying of their corner-stones. This celerity is accomplished by means of three shifts of skilful workmen, who constantly labour with the utmost zeal and the best implements—during the night by artificial light—to make the timely surrender feasible. Contractors who complete the work earlier than agreed upon receive a premium; while those who remain in arrears are fined for every day's delay. Although the erection of these structures is pushed on with a rapidity repugnant to the mind of the old-school of architects, they have successfully withstood every attack of the fiery elements; in cases where their contents have been cremated their presence became a bar to the progress of a conflagration. A building of this class, which was constructed under such conditions as I have described, survived the Baltimore ordeal of February, 1904. When older structures had to succumb, at least two of these structures bore the test of both flames and earthquake in San Francisco in 1906. It is confidently expected that if not all, almost all, will be found equally staunch during any future conflagration, even though a proper inspection during their construction may be impossible. In reconstructing Messina in Sicily, which was recently destroyed by an earthquake, several large buildings of steel construction are being erected." In hardness and durability concrete equals if it does not surpass the best stone. When timber became scarce it was used as a substitute by the ancient Greeks and Romans. The continued existence of the ruins of their concrete temples erected several thousand years ago proves the strength of the substance. The supply of good cement and of concrete is inexhaustible. Large buildings have been erected of it in many cities and in some suburbs at a lower cost than that of other material which could have been obtained for them. This is especially true of the Pacific coast. Some of the finest villas were built of concrete in Buenos Ayres in Argentina. Concrete is supposed to be proof against moderate earthquakes. A great part of San Francisco has been rebuilt of reinforced concrete. Pretentious but combustible bungalows should be replaced by comfortable dwellings which will be as impervious to fire as to water, and which will not be, like the old frame houses, in need of constant repairs.

REINFORCED CONCRETE AS A FIREPROOF BUILDING MATERIAL.

In the last few years reinforced concrete has come into such prominence as a building material that it is attracting the attention of all who are in any way interested in building, both the owner, architect, engineer, and insurance companies. They are asking many questions, and it is the endeavour of this paper to answer a few of them, although in so doing some points will probably be covered which are already pretty well known to the insurance interests, but it is necessary to mention them in connection with a more careful study of other features which are of such recent development as to be less known at present. The writer will first endeavour to explain some of the recent developments in building construction in this material, but as "recent" is a relative term, it is first necessary to explain what are now considered obsolete methods.

From the earliest use of this material, reinforcement, chiefly in the form of bars of various sections, were embedded in the concrete to take up direct tension only, concrete being required to take care of compressive stress as well as shearing stresses, both vertical and diagonal. The arrangement of beams, girders, and panel has changed but little, and has followed closely the arrangement common in wood and steel construction, the essential difference being in the present use of the reinforcement. Fifteen years and more ago a beam or girder was reinforced with straight bars embedded near the bottom of the member and extending but a short distance over the supports. There were no bent-up bars and no stirrups and no steel in the top of the member over the support. Such beams carried very heavy loads and are still doing good service. Some few which were overloaded showed cracks, and these, together with the cracks which have developed in a similar way in test specimens, have furnished the data for the more recent arrangement of the reinforcing metal. The next step in advance was the use of stirrups, set either vertically or at an angle, embedded in the beams, and their ends projecting a short distance into the panel. These were embedded near the ends of the beams or girders. A little later, in addition to these stirrups, some of the main bars were bent diagonally upwards at an angle of about 45 degrees from about the quarter point of the span, and then were carried across the top of the beam at the support and for some little distance into the adjoining span. These tied the beams together across the support and formed continuous beams, thus increasing their strength for a given weight of metal as compared with the same weight of straight bars at the bottom only, besides tieing the building more thoroughly together.

The latest development which has not as yet come into general use, but which ought to be encouraged, is of tieing all the reinforcement rigidly together that goes into a beam or girder and so fastening it into place in the forms that it cannot possibly be moved while the concrete is being placed. When bars were placed loosely it was an easy matter to displace them by an inch in height, which makes quite a difference in the strength of the resulting combination, and the ordinary workman or even the foreman does not appreciate how important it is to set the bars exactly right. It adds a little to the expense of the steel reinforcement in place to make up the units and place them rigidly in the forms, but on the other hand it saves somewhat in the placing of concrete so that the resultant extra cost is comparatively small and is entirely justified. Years ago claims were made of the advantage of one type of reinforcing bar over another, and also of certain types of mesh reinforcement in the panel were claimed to be much better than others, with the result that when interested parties made their designs, the amount of metal used was not based so much upon engineering principles as upon the commercial point of selling, and it was not uncommon to have the reinforcement stressed to nearly its elastic limit, and the structure therefore had a very small factor of safety. To-day it is well recognised that a sufficient area of cross section of metal must be used to keep the working stress within reasonable limits irrespective of the particular type of reinforcement used, and while deformed bars give a better bond than plain bars either squares or rounds, and are therefore to be desired, nevertheless the results obtained with the plain bars are so good that the owner is not justified in price between deformed and plain bars.

The latest development in floor construction, and one which has come to the front very quickly, is the so-called mushroom system of flat floors. These are flat panels without any beams whatsoever supporting them, bearing on enlarged heads on the columns, the reinforcement running directly between columns and also diagonally across the panels. The expense of these floors is no greater than in beam construction in any case, and in many cases it is a little cheaper. The advantage is that head-room can be saved, which reduces the height of columns and walls, making a saving in the building in this way. A flat ceiling is obtained without the expense of a false flat ceiling, and from a fire protection standpoint it is desirable because it is so much easier to throw a stream of water to any part of a large room without danger of its hitting a beam or girder and being deflected to the floor before reaching the farthest limit a horizontal stream can be thrown. Also in this ceiling there are no pockets to hold heated air which cannot circulate and therefore transmit heat through to the floor above, as exists in exposed panel construction with ordinary beam and girder floors. This type of floor can be used on spans as great as are ordinarily used in beam construction. The writer has built floors for 125lbs. live load per square foot on spans 20ft. by 23ft. to centres of columns, using a slab 7ins. in thickness. He has also used a slab 10ins. thick on spans 24ft. each way, with a live loads of 250lbs. per square foot. The panel should be approximately square. If one dimension is more than 20 per cent. greater than the other, economy ceases in this type of construction, and it is then preferable to use beams with a panel between reinforced in one direction only.

Numerous fire tests have been made to determine both the resistance of concrete to actual test, and also the depth to which the reinforcement must be imbedded to prevent its being damaged. The maximum depth of pitting observed by the writer in actual fire tests where a temperature of 1,700 degrees F. or more has been maintained for a period of five hours, has been in either walls or ceilings one inch to one and one-half inches. Also, by the examination of actual conflagrations, such as that at Baltimore, and elsewhere, it has been apparent that the prearranged fire tests are more severe in the results shown by the structure than actual conflagrations. Therefore, if we can protect the materials against damage in a prearranged test, they will stand any actual service. The consensus of opinion of engineers is that there should be at least one inch of concrete between the nearest point of a bar to the ceiling in panels, at least two inches below the ceiling in beams and girders, and also two inches of concrete outside the vertical bars in columns. In designing columns it is common to figure only that area of column inside the vertical bars when hooped as carrying the load, or if hoops are omitted and but light reinforcement is used to prevent bending stresses, to add an extra inch beyond that needed to carry the load all round the outside, which might be burned away without endangering the load-carrying capacity of the balance of the column within. If this is burned off it can be plastered back, giving the column the same fire-resisting qualities as before.

Fire underwriters are always interested in knowing whether a particular structure is properly built or not. There is very little difference in outward appearance between one of perfect construction, that is, in regard to size and placing of steel, size of members, etc., and one which is imperfect, and the only positively sure way to know is either by inspection or by test. There is no type of construction where more painstaking care in providing for every detail is necessary than in reinforced concrete. Concrete is either good or bad. There is no half-way about it, and if bad effects are manifested before the builder is clear of his work, he is usually the one to suffer. When possible, limit the competition to reputable builders of experience, who have demonstrated their ability to erect the work in hand and who are known to do always good work. If this is not practicable then the work should be inspected as it goes along. A precaution to assist inspection as previously stated is the setting of the steel rigidly in place before pouring the concrete. The quality of the sand and stone used must be as carefully inspected as the cement, and a sufficiently rich mixture required to allow for inequalities of mixing and placing. With well graded materials, and first-class workmanship a floor can safely be built with a mixture of one cement, three sand, and six stone, and as insurance against uneven or poor workmanship to-day it is quite common to specify a mixture of one, two, four, which, with thoroughly first-class workmanship, gives a stronger result than is necessary, and with ordinary or careless workmanship ought to give a job which is still strong enough. Incidental to the process of construction, while the concrete is still green and much weaker than it will be with age, it is loaded frequently as heavily as it ever will be in actual service, and always it is loaded sufficiently to give a fair idea of its strength. Where there is any doubt of its strength, load tests can be applied. With these safeguards, in addition to those provided by the engineer, architect, or building department, the underwriters need have no fear that a building they are asked to insure is structurally weak.

The question is sometimes asked, what proportion of builders now engaged in reinforced concrete work are competent? It is impossible for one who has no wide acquaintance with builders in all parts of the country to answer such a question. He can simply say that in all large cities there are a few builders whose ability has been proved beyond a doubt, and the selection of any one of them is insurance that good work will be done, and by the competition between them reasonable prices can be obtained.

The other types of fireproof construction which are coming into competition with reinforced concrete are structural steel encased in concrete, and this, when thoroughly encased from a fireproof standpoint is similar to an all-concrete building; structural steel frame encased in terra cotta, and to a small extent plaster of paris and brick have been used in fireproofing steel, but not to a sufficient extent to be worthy of much comment. Thoroughly well-laid brickwork is a good protection to columns, but when cast as arches between beams it leaves the bottom flange exposed, which is a serious defect. Actual conflagrations have conclusively shown that terra cotta is not so perfect a fire protection as concrete. This is largely, in the writer's opinion, due to the fact that its coefficiency of expansion is high, so that it expands to such an extent that when confined between the beams it is crushed, the lower member falling, and thus weakening the floor. It is also more susceptible to a combination of fire and water, being to some extent brittle and cracking when a cold stream strikes a hot surface.

Before concrete will disintegrate when exposed to fire, the large amount of moisture chemically combined in the setting of the cement, being 20 per cent. or 25 per cent. of its weight, has to be driven off by heat, and then the vapour thus driven off has to be evaporated from the pores of the concrete before it becomes sufficiently hot to crumble. The slowness of evaporating this vapour is probably the cause of concrete resisting extremely high temperatures for the brief period of a few hours, while a much lower temperature, if long continued, would ultimately disintegrate it. Cement will resist 500 degrees F. for an indefinite period, while a continuous temperature of over 700 degress F. is disastrous. The cement coating of the stones of the concrete will resist the attack of fire so long that it is of less consequence whether the stone can be damaged by the fire or not. Thus pure limestone is a most excellent aggregate, and will not decompose until after the cement has, and after the cement has gone it is immaterial what aggregate is used, as the work has then failed anyway.

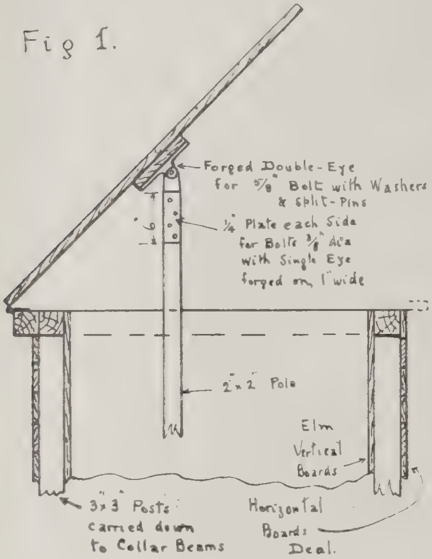
Regarding the cost of this type of construction as compared with others, the large use has proved conclusively that it will compete, because the item of cost is considered paramount in 99 out of every 100 structures. For large buildings the structural frame is almost always cheaper than the steel. Thin curtain walls cannot be built as cheaply on account of form work, which is constant for a thin wall as well as for a thick one, but if the wall must be sixteen inches or more in thickness, concrete is cheaper than brick. In small structures, such as dwelling-houses, concrete is materially more expensive than brick or wood, because the form work is more irregular, cannot be used over, and because of the greater expense of supervision. This is why it is not commonly used in small dwellings, and probably will never be much used. It has been used and can be economically used for large dwelling-houses, especially those of simple design, where the form work is nearly as easy of execution as in an office building or mill.

It has been decided to rebuild the Bradford Infirmary on a central site, which is now under consideration.

PREVENTION OF STEAM IN DYE WORKS.

A correspondent having raised a point about superfluous steam in a vat-room it may be assumed that the steam of which he complains is caused and made a nuisance by the cold air that is let into the shed "to blow the steam away," and by the coldness of the walls and roof chilling the vapour to a temperature near the dew point. The only ways to prevent this are to keep the room or shed warm, and to warm the air as it enters. This is best done by a fan blowing in hot air from the engine or boiler house, or from an air heater in the chimney flue, this last being the cheapest method. To enable the steam to get away from the vats and pans, and to prevent its spreading all over the shed—and the latter is the chief trouble—a hood is needed to each vessel, with a chimney or two, according to size. These chimneys are best made of wood, plumb all the way up, and with boards inside as well as out to keep the steam above the condensing point in winter. When these chimneys or towers are open at the top, or fitted with a lid as shown in Fig. 1, or else pivoted at the centre, the net area of the tower should be not less than one-sixth that of the surface from which the steam comes; with a closed top or partly-closed top and louvred sides, as shown in Fig. 2, the area should be not less than one-fourth that of the surface from which the steam comes. It is likely that our correspondent will have to use tops and louvres, as the uneven height of the buildings around will cause eddies and down-blast when the wind is from a direction different from that shown. Canvas curtains or light, wooden shutters, with cords and balance weights, may be needed by some machines at the hoods, and if light on to the beck or vat is needed, the slope of the hood can be of glass. The towers for loose steam are not boarded below the roof, while those for the becks are, of course, boarded down to the hoods. Towers from the becks mean that the roof details cannot be settled till the position of the becks are known, which is as it should be, for a dye-house is a huge machine, and no one part can be skilfully decided on without consideration of the others. Open slates are all right on the roof in summer, but of great harm in winter; for a warm roof is needed to prevent drip and the chill of winter winds blowing between the slates at once takes out any warmth they may get from steam. It is the drip on to finished cloth that spoils it, and enquirers will have found that dyers will endure steam, but will not have drip. Can the fans of the adjoining mill not blow into the dye-house? They may not supply enough warmth and air, but they can clear steam from their own region. If the vats can be raised high enough to allow the spent liquid from them to go through 4in. hot-water pipes along the house to the drains, a good deal of warmth will be given to the house every time a vat is run off, and at no cost in fuel, and with a saving in steaminess compared with the style of emptying the vats on to the cement floor. A warm dye-house is a clear one, and a cold house a steamy one. Exhaust steam may be available, and can be used in pipes slung overhead, and if used to warm the entering air it can be condensed quickly in winter, thus saving water. Superheated steam in pipes overhead will give warmth at no extra cost above that for ordinary steam to boil only. A tubular air-heater for steam or to burn coke could be fixed on the north-western wall, and whenever the prevailing wind blows, volumes of warmed air will get into the dye-house without help from a fan, and the house would be warmer and drier. The cost of this heater, fixed, may be £100. With a steam chimney direct to each vat, much smaller outlets are needed at the ridge, and the writer has never yet come across a louvred ridge that was satisfactory and could be relied on. Pivoted louvres are always an aid, and will probably cost less than the wind-screen our querist suggests. There is no need to use a steam pipe in the chimney to make draught; the vat sides warm enough air to make a current, and the space between the double boards keep in the heat. To our best knowledge, pitch-pine straight from the saw, unplaned and unpainted, is good timber for the main rafters. Elm will be good for the lining boards of the steam chimneys. The wind screen described by the enquirer will not help the ventilator, and the timber it needs would be better used to cover the lower portion of the louvres, thus raising them higher above the roof, and obtaining a chimney-like action on the steam and air. It is the way to get air and warmth into the shed that is more trouble than getting the steam out. The greater steaminess in summer will be due to eddies and draughts on the roof, making a balance of air pressure, and preventing movement being given by the wind to the air in the shed.

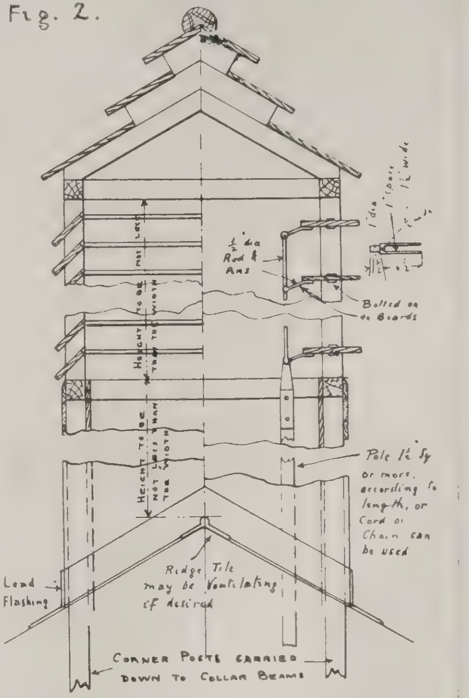
Fig 1.


Forged Double-Eye for 5/8" Bolt with Washers & Split-Pins
1/4" Plate each Side for Bolts 3/8" dia with Single Eye forged on, 1" wide
2" x 2" Pole
Elm Vertical Boards
3" x 3" Posts carried down to Collar Beams
Horizontal Boards Deal.

SECTION OF STEAM CHIMNEY OR TOWER

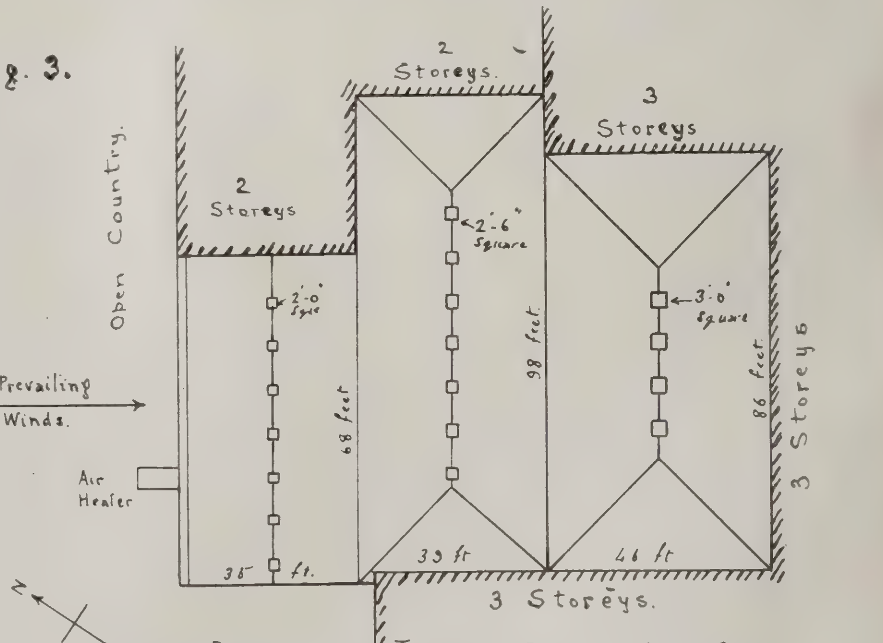
Hinge to be on Windward Side

Fig. 2.


1/2" dia Rod & Arms
Bolted on to Boards
Height to be not less than the width
Pole 1½" Sq or more, according to length, or Cord or Chain can be used
Ridge Tile may be Ventilating if desired
Lead Flashing
Corner Posts carried down to Collar Beams

HALF SECTIONAL ELEVATION ORDINARY LOUVRES — HALF SECTIONAL ELEVATION PIVOTED LOUVRES

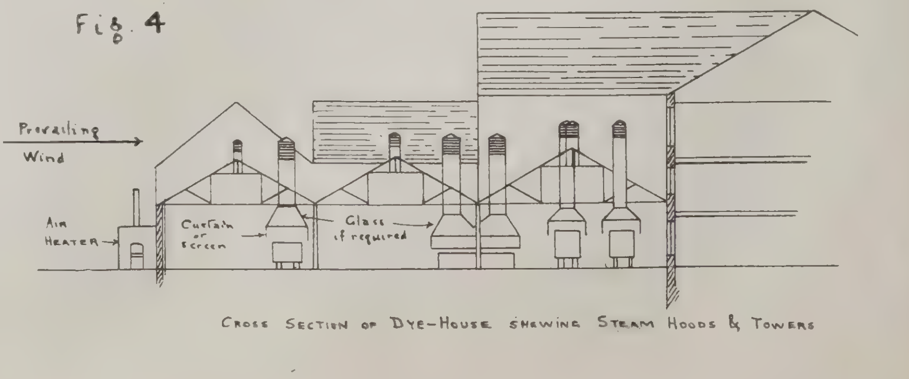
Fig. 3.



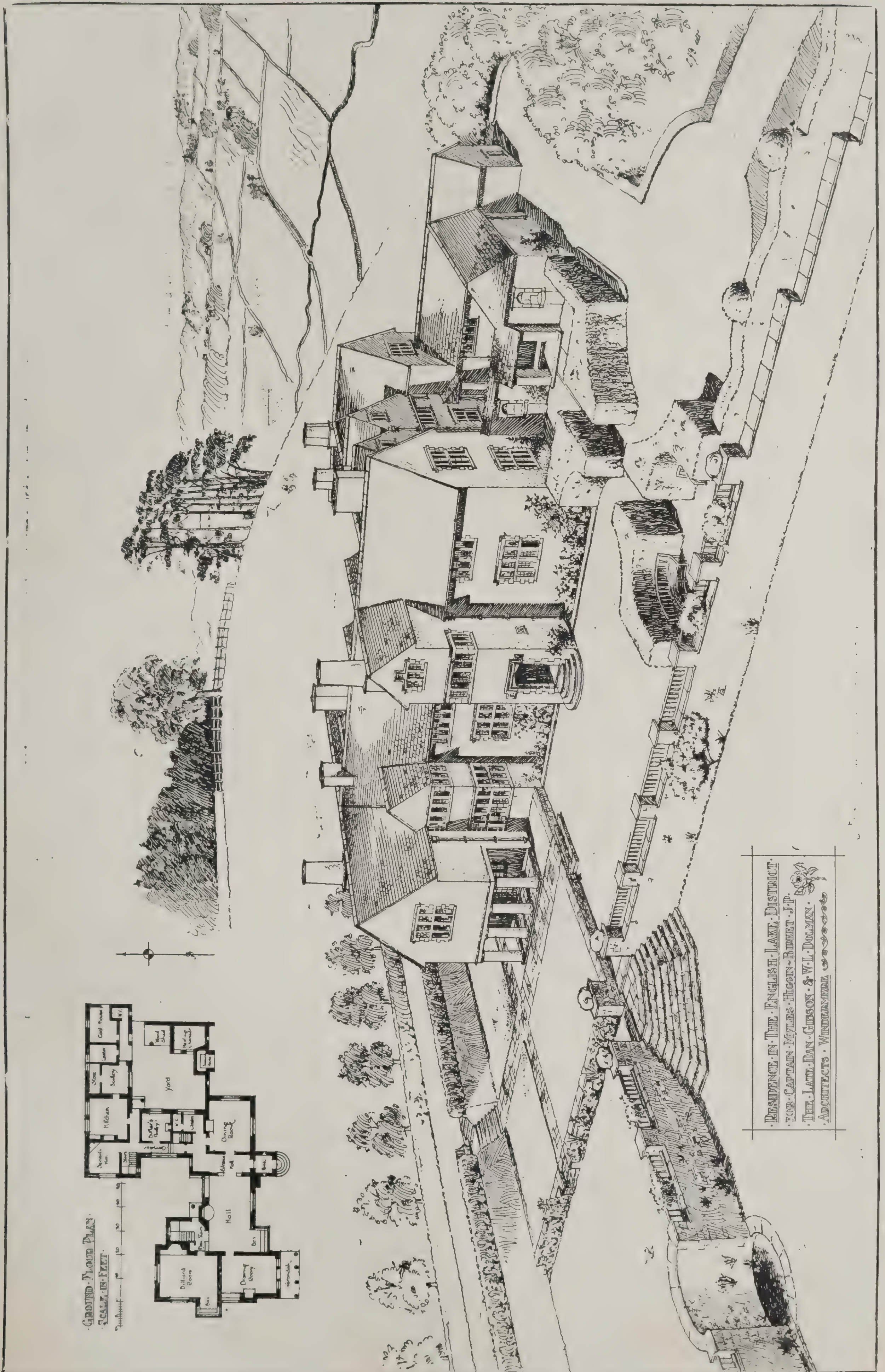
PLAN SHEWING TOWERS ON RIDGE FOR LOOSE STEAM ONLY

Cast Iron Columns 10'-6" Centres. Towers 21'-0" Centres

Fig. 4



CROSS SECTION OF DYE-HOUSE SHEWING STEAM HOODS & TOWERS



·Residence·in·The·English·Lake·District·
·For·Captain·Myles·Higgin-Birket·J.P.
·The·Late·Dan·Gibson·& W·L·Dolman·
·Architects·Windermere

THE LONDON FIRE BRIGADE

The London County Council has in contemplation or in hand sundry alterations and improvements to fire stations:—

Clerkenwell Fire Station.

This station is to be altered and enlarged, at a cost estimated at about £11,000 to £13,000. Room for the extensions will be obtained by the acquisition of No. 42, Rosebery Avenue, at a cost of £1,350. By this rearrangement it will be possible for the horses to be stalled behind the appliances, for all the single firemen to be accommodated together on the first floor, with sliding poles to the ground floor, for up-to-date quarters for married men to be provided on the upper floors of the extension, better accommodation for the long ladder, a covered run-in for the appliances, a separate entrance controlled from the watch-room, and a drill tower.

Woolwich Fire Station.

Tenders are to be invited from selected firms during the present recess for the alteration and enlargement of this station.

New Station, Bromley-by-Bow.

A new fire-station is to be built in Brunswick Road on a piece of vacant land acquired by the Council, and quantities are to be taken out and lithographed with a view to inviting tenders for the erection of the building.

Inspection Work.

The work performed by the inspection branch of the fire brigade, and consisting principally of the inspection of theatres, music halls and other places of public entertainment, common lodging houses, and Government buildings, and of work arising out of applications under the London Building Acts, has during the past few years greatly increased, the increase being most marked in the number of inspections made of buildings in which cinematograph entertainments are given, and in the number of reports on applications for consent to the erection of buildings of large cubical extent. The number of these applications has grown substantially since the clauses in the Council's General Powers Act of 1908 on the subject became law, and a recent decision of the Building Act Committee that those buildings of large cubical extent in which fire-appliances are required to be provided as a condition of the Council's consent should in future be annually inspected by the brigade also increases the work of the inspection branch. The brigade inspection staff consists at present, apart from technical and clerical assistants, etc., of a superintendent, two district officers, and six station officers, a total of nine men, and it has stood at this number since 1904. In May, 1906, however, the number of station officers engaged on the inspection of theatres, etc., and common lodging houses was reduced by one, and in place of this station officer a district officer was appointed for work in connection with the inspection of Government buildings and the preparation of reports on Building Act applications. The reduction in the number of men required for the inspection of theatres etc., and common lodging houses was made possible by the fact that the first inspections of all common lodging houses in London were completed in 1906, and that since then annual inspections only have been necessary. The amount of work in connection with these annual inspections of common lodging houses has been fairly constant since 1906, and there is no likelihood of its decreasing. The number of inspections of places of public entertainment has, however, increased by about 7 per cent., and of those at which performances are regularly given and scenery is used by about 9 per cent. Moreover the provisions of the Children Act, 1908, with regard to performances for children, or at which the majority of the persons attending are children, and the number of children exceeds 100, involve additional inspection work.

New Divisional Officer.

Mr. A. R. Dyer, assistant divisional officer has been appointed to the position of divisional officer (North), vacant through the appointment of Lieut. Sladen to the position of chief officer of the brigade.

PRECAUTIONS AGAINST FIRE IN UNDERGROUND ELECTRIC RAILWAYS.

At the last meeting of the London County Council the observations of the Board of trade on the precautions against fire in tube railways, drawn up by the Council, were reported by the Fire Brigade Committee. The resolutions of the Council were as follows:—

(i.) The fire-appliances on all tube railways, whether constructed before or since 1904, should be periodically inspected by the chief officer of the fire brigade with a view to seeing that they are efficiently maintained, and in making such inspection the chief officer should deal with any points which may occur to him affecting the general question of protection from fire, and should communicate direct to the Board of Trade any suggestions which he may desire to make.

(ii.) There should be provided on all tube railways, whether constructed before or since 1904, automatic signal lights, or preferably an illuminated sign, which would show on the platforms of stations concerned and also on the street level when the current to the live rail is cut off in either direction.

(iii.) The owners of all tube railways constructed before 1904 should be called upon to comply, with as little delay as possible, with the requirements made in that year, or if this is considered impracticable, such railways should at least be provided with—(*a*) fire-appliances as far as possible in conformity with the minimum requirements made in 1904; (*b*) a hydrant, with sufficient hose, fitted 100 yards down each tunnel from each end of each platform; and (*c*) an incombustible platform between and at the sides of the rails for persons to walk upon.

(iv.) The minimum requirements, etc., as regards fire-appliances made in November, 1904, should be varied by the omission of the observation (*d*) as to the fire brigade being practically of no avail in the event of a fire obtaining a hold in a tube railway, and the substitution therefore of the following observation—"In the event of a fire in a tube railway not being readily extinguished by the railway employees, notification should be immediately given to the fire brigade by telephone and by the nearest fire-alarm."

The Board of Trade reply on the various points raised is as follows:—

As regards (i.) the Board states that the proposal has been communicated to the companies owning all the tube railways in London, and that these companies acquiesce generally in a periodic inspection of the fire-appliances on their respective lines by a person nominated by the Board of Trade. The Board accordingly asks that the chief officer of the fire brigade may be allowed to make such periodic inspections on their behalf, and the Board suggests that the inspections should, at any rate for the present, be made annually. The Board further suggests that it should be informed by the chief officer when he proposes to inspect the appliances on a railway, and that the Board should then notify the company concerned, leaving the actual date of the inspection to be arranged between the chief officer and the company. Any recommendations or observations which the chief officer may find it necessary to make would be forwarded by him to the Board, and communicated by the Board to the company concerned. There are seven tube railways in London, with about 80 stations, and the inspection would consequently occupy some considerable time, but we are advised that the work could be undertaken by the inspection staff if the Council sanctions the appointment of the additional station officer recommended in the previous paragraph of this report. The order of reference to General Purposes Committee provides that they shall consider and report upon all questions relating to the duties of heads of departments, and we have therefore informed them of the proposal that the chief officer should undertake the periodic inspection of tube railways. The General Purposes Committee concur in the proposal and are submitting the necessary recommendation to the Council accordingly.

With regard to (ii.) the Board states that it is advised that there are objections to the proposal on the grounds both of difficulty and expense. The Board understands that at present there are switches in every signal box or stationmaster's office, whereby the current between any two stations can be cut off, and that firemen could therefore always ascertain by inquiry, or, if necessary, by looking at the switch, whether the current was on or off. In these circumstances the Board did not think it necessary to bring the suggestion to the notice of the railway companies. We pointed out to the Board that the positions of the signal boxes and stationmaster's offices were not exactly known to the fire brigade, and, owing to the small number of officials available at a station, could not always be quickly ascertained; and, further, that in the event of a fire occurring, and the stations becoming heated and filled with smoke, as was the case at the fire which occurred at the Moorgate Street Station of the City and South London Railway on July 16th, 1908, and at other fires, there would probably be considerable difficulty in obtaining access to the boxes or offices in question; and we urged the Board to reconsider the matter and adopt the Council's suggestion. The Board, however, adheres to its opinion that the arrangement proposed by the Council is not reasonably practicable, and in view of this we do not see that the Council can take any further action in the matter.

Suggestion (iii.) deals with tube railways constructed before 1904, when regulations were laid down by the Board, one of which was that efficient hydrants, hose, and fire-appliances should be provided to the satisfaction of the chief officer of the fire brigade. The Board intimates that it brought the Council's recommendation before the owners of lines constructed before 1904, although, as the Board points out, it has no power to impose the regulations of 1904 on the owners of such lines. In reply the owners of the railways affected, viz., the Central London Railway Company and the City and South London Railway Company, have assured the Board that they are desirous of complying as far as possible with the requirements, and the Board understands that work is now in progress on both lines with this object. The inspection to be made by the chief officer will, of course, reveal the progress made with this work, and the chief officer will be able to call the Board's attention to any matters which he considers necessary.

As regards (iv.) the Board states that it sees no objection to the substitution of the words proposed by the Council, and that the railway companies have been communicated with accordingly.

In conjunction with a leading firm of Manchester architects, Messrs. Fryers and Penman, architects, Largs, have secured the work of designing a large and important block of property in Manchester, which is to be utilised for, among other things, an exchange and central agency for the Calico Printers Combine. It is understood that the building may cost from £150,000 to £200,000 before it is completely finished.

* * *

At Edinburgh Dean of Guild Court yesterday, warrants have been granted to the Royal Infirmary of Edinburgh for a new operating theatre; to the Edinburgh Marine Gardens (Limited) for a tea-room; and to John Hay for a tenement at Seafield Road.

Federation News.

The Northern Centre.

The half-yearly meeting of the Northern Centre Executive was held at the Queen's Hotel, Southsea, on Tuesday, July 20th, when Councillor S. Easten, Newcastle-on-Tyne, presided. The chief matter before the meeting was to receive Mr. J. B. Johnson's report regarding the amended N.A.O.P. agreement. Mr. Johnson gave his report, which was considered satisfactory. It was thought that the report would be of interest to all the members, and the secretary was instructed to have the same published in the official journal, and arrangements are being made for it to appear in a later issue. Several matters appearing on the agenda for the National half-yearly meeting were also considered at some length.—JAMES DENVER, secretary.

The Northern Centre Conciliation Board.

A special meeting of the Northern Centre Board was held in Leeds on July 5th, when an appeal was considered from the Rochdale Board re joiners' wages and working rules. The notice was received from the Operatives' Society for an advance in wages of ½d. per hour—9d. to 9½d. Witnesses were heard from both sides, and evidence taken, after which the Board gave the following decision:—"That subject to all present notices for alterations to rules being withdrawn, the wages of the Rochdale joiners be increased ¼d. per hour, such advance to come into operation on July 1st, 1910, and to remain in force for two years from that date." Several alterations were proposed to the remaining rules and adopted. The Rochdale employers agred to withdraw their notice, which had not yet expired; therefore the decision of the Board carries. An appeal from the Blackpool joiners was before the meeting, but owing to the lateness of the hour it was agreed to postpone the hearing of same until the 28th ult.—JAMES DENVER, Employers' Secretary.

Yorkshire Federation.

The monthly meeting of the Executive Council of Yorkshire Federation was held at the Albemarle Hotel, Westborough, Scarborough, on Friday, July 16th. Mr. W. R. Thompson (president) was in the chair, and 31 delegates were present from affiliated associations. The receipt of £32 13s. 4d. from various sources during the month was duly reported. It was reported that quotations had been received for the insurance of horses belonging to the members for either trade or private purposes. On the motion of Councillor W. G. England, J.P., seconded by Alderman J. Birch, J.P., the quotations were referred to the Emergency Committee for consideration and report.

The observations of the Grimsby, Leeds, Sheffield and Wakefield associations were reported on the draft sub-contract form submitted for consideration. On the motion of Councillor W. G. England, J.P., seconded by Mr. T. Lindley, it was resolved to afford local associations a further opportunity of giving the draft agreement their careful consideration, with a request for observations to be submitted in writing not later than September 1st.

Mr. T. Lindley, the president of the N.A.M.P., explained the draft proposed revised agreement with the N.A.O.P. The Federation, on the motion of Mr. T. Lindley, seconded by Councillor J. Dawson, approved of the revised agreement between the National Federation, the National Association of Master Plasterers, and the National Association of Operative Plasterers.

The President reported that the other Federations had now paid the apportionments due from them on the National Reserve Fund Account. On the motion of Mr. A. J. Forsdike, seconded by Mr. Sinclair, it was resolved to send a special circular to the local associations requesting that this matter be given urgent attention not later than September 30th, with a view to the amount allotted to the Federation being honoured by the end of the year.

The recommendation of the National Administrative Committee with respect to the journal being supplied to local association members at a reduced charge and the balance of cost being paid out of the funds of the local association was considered. On the motion of Councillor J. Dawson, seconded by Mr. T. E. Taylor, the Federation expressed their sympathy with the efforts to extend the influence of the Journal, but were strongly of opinion that the resolution of the Administrative Committee should be altered to read in the form of a recommendation only, and not of a resolution binding upon all local associations.

A letter was read from the Wakefield Association recommending the Council to have the report of Mr. Sinclair presented at the last meeting of the Council (on his recent visit to the Continent to inspect housing and town planning) printed and circulated amongst the members of local associations. It was pointed out that an official and exhaustive report had been issued by the Housing Reform Council at a cost of 3d. per copy.

A letter was read from the Nottingham Association asking whether charges were made for water supplied to baths having no direct connection, but being filled by a tap from the copper, and emptied by a waste pipe which forms the swivel. It was stated that similar letters had been sent direct to local associations, and that suitable replies had already been forwarded.

Mr. E. Quibell, president of the Hull branch, called the attention of the Federation to what they considered to be an injustice to one of their members.

As more is likely to be heard of the case, the particulars are for the present withheld. In discussing the case strong emphasis was again placed on the absolute necessity of contractors continuing their agitation for the insertion of an arbitration clause in all contracts.

A letter was read from the Sheffield Association stating that the association had agreed with the bricklayers for one hour's notice being given on leaving, provided that there be no cessation of work during the said notice. Mr. Forsdike stated that the Sheffield Association were desirous of obtaining the Federation's consent to notices being given to the bricklayers and joiners with respect to walking time. On the motion of Mr. Sinclair, seconded by Councillor G. Mansfield, J.P., the Sheffield Association were empowered to give notice accordingly, if such step is deemed necessary or expedient. On the motion of Mr. J. Biggin, seconded by Alderman J. Birch, J.P., it was resolved, in view of the prevalence of holidays and the visit of the Belgian builders to Sheffield, that the Federation do not meet during August, and that the president and secretary be empowered to make the necessary arrangements for the September meeting.

The president and members of the Scarborough Association afterwards entertained the members to tea, and a hearty vote of thanks was accorded to them for their generous hospitality.—J. DAVIDSON.

BRADFORD ASSOCIATION.

Joint Secretaries: J. Davidson and J. H. Hopkinson.

The monthly meeting of the Bradford Association was held at the Builders' Exchange, Bradford, on Tuesday, July 27th. The president (Mr. T. E. Taylor) and several members were present. The treasurer presented his report, and the President expressed the great pleasure he had experienced at the last Federation meeting, when it was reported that the Bradford Association had paid its subscription and reserve fund contribution for the current year. The minutes of the Yorkshire Federation were read and considered, and a very interesting discussion took place on the case of the Hull joiner and Hull city architect. The form of subcontract remitted by the Federation for the observations of the local Associations was considered clause by clause, and several suggestions were agreed upon for recommendation to the Federation. Mr. R. Raper reported on the proceedings of the National Federation meetings at Portsmouth.

LEEDS ASSOCIATION.

Secretary: J. Davidson.

The Leeds Association has recently lost one of its oldest and most respected members by the sudden and sad decease of the late Mr. Charles Myers. His death took place while returning from Canada, after visiting a daughter and other relatives. During his career he had taken an active interest in public affairs, and was for many years a members of the Leeds Council. He was in frequent request in connection with arbitration proceedings, and his wide experience and expert knowledge eminently fitted him to act either as arbitrator or witness. A resolution of profound sympathy has been forwarded by the Association, and the President (Mr. W. Irwin) and several members were present at the funeral service and interment, which was largely attended. Messrs. W. T. Ledgard and J. H. Tomlinson were also present as representatives of the Yorkshire Federation.

REDDITCH ASSOCIATION.

Secretary: F. Turner.

The annual outing of the Redditch Master Builders' Association took place on Saturday, the 10th inst., when the members of the Association, their clerks and secretary, to the number of 20, had an enjoyable drive in a char-a-banc supplied by Messrs M. Huntley and Son. A start was made from Redditch at 8.30 a.m., and Evesham was reached about ten o'clock. After wandering about the town, a well-served dinner, over which the President of the Association (Mr. H. J. Surman) presided, was partaken of at the "Rose and Crown" Hotel, High Street, after which the President proposed the usual loyal toast. The party then proceeded to Broadway, when an hour was well spent in viewing the ancient village, and then to Bidford, where tea, provided by Mr. Holland, was served. A steamer was then chartered, and a trip taken to Cleve Mill. On the return to Bidford a cricket match was held, two teams being picked, of which Mr. Surman and Mr. Newbould were the respective captains, Mr. Surman's team being victorious. The arrangements for the outing were made by Messrs. Newbould and Edkins, and were admirably carried out. The President proposed that a hearty vote of thanks be accorded to these gentlemen for the trouble they had taken. Mr. F. C. Huins seconded. The proposition was carried unanimously, and Messrs. Newbould and Edkins responded. Redditch was reached about 10.30 p.m., and all present agreed that they had had an enjoyable time.

BARNSLEY ASSOCIATION.

Secretary: J. Denton.

The monthly meeting was held on the 14th ult., Councillor G. Haigh in the chair. An important discussion on the proposed amended form of sub-letting agreement was initiated by Mr. T. Lindley, drawing attention to the provision in the clause on the insurance of the building in progress, that each trade should bear its share of the cost of insuring. The builder had usually a clause in his quantities to that effect, but the other trades had no such clause. Mr. F. Goodyer replied that the builder would naturally fill in the item for the whole of the trades. The President also confirmed this as the usual course. Mr. Lindley submitted that as the sub-contract agreement contained a clause making the sub-contractor liable for his share of the insurance, the sub-contractors' quantities should also have an item to the same effect. The Vice-President, Mr. E. Broley, was of opinion that Mr. Lindley had wrongly interpreted the insurance clause, and that the sub-contractor had no liability whatever. Mr. Lindley admitted that he might have done so, but was not sure, and he suggested that the Barnsley delegates should raise the question at the next meeting of the Yorkshire Federation:—"Whether, in case of fire or other damage to building still in the hands of the builder, the builder would bear the whole cost of the insurance, or whether the sub-contractors would be expected to share the cost." The builder members generally thought that some of the clauses were too drastic, but on the other hand, the sub-traders thought they were fair and impartial. The arbitration clause in particular was very adversely criticised by the builder members. The President remarked that the agreement was all in favour of the sub-contractor. Ultimately the agreement was unanimously approved on condition that the delegates asked the question concerning the insurance clause at the next Yorkshire Federation meeting. The proposal to build new tea-rooms near the entrance to the Park, and the alleged infringement of the local by-laws in not keeping the proposed new building within the building lines, was next discussed. Several members criticised the action of the Corporation, stress being laid upon an act of injustice done to one of the members over an alleged infringement of the by-laws. It was held that as the Corporation made the by-laws they should certainly be the last body to infringe them. The Hon. Secretary was instructed to draft a letter to the Parks Committee containing a copy of the resolution unanimously approved, viz.: "That the Burial Boards and Parks Committee be asked to rigidly adhere to the by-laws—that is, to observe the building line in connection with the building of the new tea-rooms." Mr. Lindley, as the President of the National Master Plasterers' Association, submitted an abstract of the new rules to be laid before the half-yearly conference of the National Federation at Portsmouth, for their confirmation. The President urged the members to rally around the Sheffield Association and make the visit of the Belgian builders a success.

The annual outing of the Barnsley Federation of Building Trade Employers took place on Thursday, July 8th ult. The party, to the number of fifty, were conveyed in motor char-a-bancs to Wentworth-Woodhouse, the beautiful residence of the Earl of Fitzwilliam. The party, who had a special permit to view the inside of the house, were conducted through the various rooms by the housekeeper, the priceless works of art, historical family relics of Charles the First, being courteously explained to the members by that lady. During the afternoon the annual cricket match was played, "Builders" versus "Rest of Federation," resulting in the usual decisive defeat of the "Builders," the scores reading: "Rest of Federation" 48, "Builders" 18. The ladies of the party were specially catered for in a motor char-a-banc run in and around the beautiful surrounding country. The evening was devoted to singing and the usual excuses by the "Builders" of their defeat. However, all things good and otherwise come to an end, and one of the most enjoyable outings in the history of the Federation terminated amidst the good wishes of all concerned.

LEEDS FIRECLAY CO.'S EXHIBITION FOR THE HEALTH CONGRESS.

Trade and Craft.

The members of the recent Health Congress held at Leeds were invited to visit the works of the Leeds Fireclay Co., Ltd., on the Tuesday, Wednesday, and Thursday afternoons, and large numbers availed themselves of the privilege. At their Royds Works, a special exhibition of which an illustration is given, had been prepared showing the products of the company's various works, including a section of a swimming bath, a park urinal in vitreous terra cotta, closet partitions and workmen's shower baths erected in patent partition bricks, as well as examples of the company's well-known productions in the way of glazed bricks, terra cotta, porcelain baths, lavatories, drainage specialities, etc., etc. Among the visitors were a considerable number of medical officers of health, surveyors, and sanitary inspectors, who were specially interested in the display of novelties in the way of school lavatories and urinals. The company provided tea and other refreshments for the visitors.

A scheme for a gigantic railway goods clearing-house in London is being mooted by Mr. A. W. Gattie, Mr. Guy Lloyd, A.M.Inst.C.E., and Mr. A. G. Seaman, M.Inst.E.E. The object is to facilitate transit, relieve congestion, and render unnecessary some 75 per cent. of the goods vans that at present cumber the streets. The basis of the proposal is the use of the patent electric sorting and handling machinery, invented by Mr. Gattie. The clearing-house would be erected at a centre connecting all the systems of London. Plans for it have been prepared by Mr. R. Stephen Ayling, A.R.I.B.A. There is some idea of applying the invention to the handling of parcels in the post. By merely pressing a button a parcel could be sorted for Manchester or Birmingham, as the case might be; and the machinery will deal with anything from a postcard to a heavy bale.

* * *

The Oldham Corporation have recently adopted a new fair contracts clause after consultation with the master builders and the local Trades Council. It has, however, not given satisfaction to either of the two parties. The Trades Council have condemned portions of the clause, and a letter was read at the Finance Committee's meeting from the Oldham Master Builders' Association complaining of the unfairness of a section of the clause which provides that the corporation can impose a penalty up to £500 for the breach of a contract. The association contended that the penalty should be fixed by an independent person, and they should have the right of appeal to arbitration against the corporation's decision on the question of a breach of contract. They also asked that a deputation should be allowed to appear before them on the question. It was suggested that the clause be allowed to remain as it is, as the section would not be put into operation in one out of five thousand cases. It was ultimately decided to wait and see if any complaint came from the Trades Council.

* * *

A Local Government Board inquiry has been held in Bedford regarding the proposal of the Bedford Corporation to borrow £15,000 for a dust destructor, £25,775 for completion of the water supply scheme, and £11,000 for enlarging the mains.

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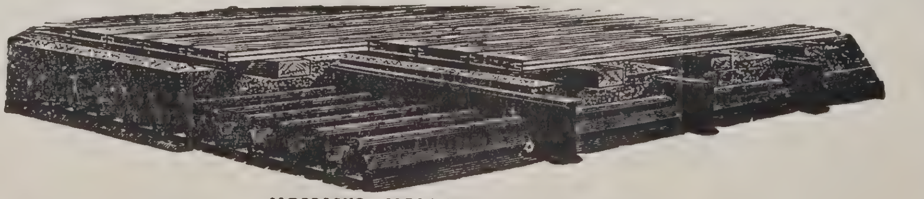

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B. E. Nightingale, Albert Embankment, S.E.	£7,946	0	0
C. Miskin and Son, St. Albans	7,323	0	0
J. Guttridge and Son, Peterborough	7,268	0	0
J. Honour and Son, Tring ...	7,173	16	8
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J. Parren and Son,* Earith, Hunts	5,993	0	0

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R. Friend	£1,088	10	0
T. Hiles	988	0	0
C. Cooke	984	0	0
Beavan and Hodges	965	0	0
W. Powell	956	0	0
W. Bowers	940	0	0
E. W. Wilks*	889	10	0

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Byron Road.

H. E. Phillips	£1,950
West Bros.	1,775
F. and G. Foster	1,683
G. Baker and Son	1,599
G. Gates and Sons,* Strood	1,535
L. Seager	1,419

Richmond Road.

H. E. Phillips	£920
West Bros.	789
F. and G. Foster	827
G. Baker and Son	689
G. Gates and Sons*	689
L. Seager	653

*Accepted.

Harrow.—For new County school at Harrow, for the Middlesex County Council. Mr. H. G. Crothall, architect:—

G. Neal	£15,550
Holliday and Greenwood	15,400
Rider and Son	15,218
Mattock Bros.	14,987
Appleby and Sons	14,915
W. Johnson and Co.	14,721
F. G. Minter	14,687
Holloway Bros.	14,600
C. F. Kearley	14,484
Perry Bros.	14,397
F. and F. H. Higgs	14,320
Mattock and Parsons	14,274
Treasure and Son	14,138
Lawrence and Son	13,822
Knight and Son*	13,336

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Harrow.—For new County school at Harrow, for the Middlesex County Council. Mr. H. G. Crothall, architect:—

Mattock Bros.	£10,100
G. Neal	9,490
W. Tout	9,246
C. F. Kearley	9,095
H. Haynes	9,000
W. J. Renshaw	8,988
Rowley Bros.	8,905
A. Porter	8,779
F. Gough and Co.	8,699
W. Lacey	8,647
W. J. Dickens	8,602
W. Lawrence and Son	8,482
Treasure and Son	8,410
Knight and Son*	8,121

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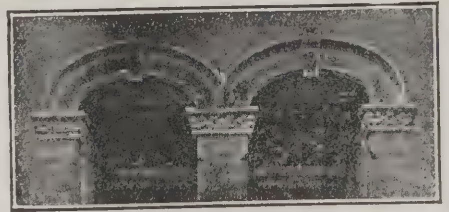

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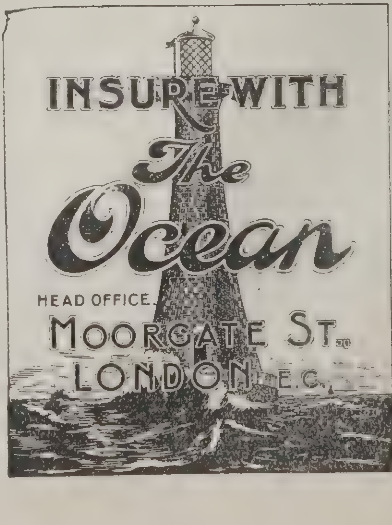
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Honolulu—Honolulu.
Panama—Ancon.
Bermuda—Hamilton.
Straits Settlements—Singapore.
Porto Rico—San Juan.
Jamaica—Kingston.
Mexico—Mexico D.F.
Argentine Republic—Buenos Aires

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(Signed) HERBERT HORSFALL."

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Name.. Age..............
Street ....
Town.............................. Occupation ....
4, 8, 09

(Tenders continued from page vi.)

Biggleswade.—For the erection of Church of England Schools for girls and infants at Biggleswade, Beds., for the foundation managers. Mr. Thomas Cockrill, A.M.Inst.C.E., architect, Market Square, Biggleswade. Quantities by Mr. Henry Bushell, F.S.I., 33, New Bridge Street, E.C.

	School Buildings.	Offices and Latrines.	Drainage.	Playground and New Road.	Boundary Walls & Fences.	Bell Turret.	Total.
Thos. Raban and Sons, Baldock	£2,669 17 0	£472 11 6	£119 18 2	£386 4 10	£439 5 1	£50 10 11	£4,138 7 6
A. Henman and Son, Biddenham, Bedford	2,641 10 0	455 14 1	183 6 6	414 5 8	381 10 8	52 4 2	4,128 11 1
Shrouder and Matthews, Stevenage	2,667 19 1	439 5 8	125 18 1	332 7 11	473 17 8	53 0 0	4,092 8 5
William Haynes, Sandy	2,716 10 0	471 5 0	94 17 0	199 3 8	462 9 4	53 3 8	3,997 8 8
Francis Newton, Hitchin	2,372 2 1	486 16 3	161 6 8	348 9 8	453 11 8	51 13 8	3,874 0 0
Coulson and Lofts, Cambridge	2,411 17 0	425 16 0	151 10 0	360 11 0	419 6 0	48 0 0	3,817 0 0
William Wade, St. Neots	2,425 0 0	450 0 0	100 0 8	355 9 6	412 0 0	49 0 0	3,799 9 6
Frank Welham, Eaton Socon	2,410 0 0	450 0 0	100 0 0	347 1 7	398 0 0	48 0 0	3,753 1 7
Arthur Negus and Sons, Cambridge	2,370 0 0	438 14 3	109 6 10	362 13 4	411 19 10	46 18 2	3,739 12 5
G. Cage and Son, Buckden	2,380 13 0	438 19 0	101 0 0	335 11 0	384 10 0	46 12 0	3,687 5 0
Chas. Wright, Langford	2,400 0 0	380 0 0	85 0 0	350 0 0	400 0 0	48 0 0	3,663 0 0
H. Hinkins, Royston	2,227 1 1	420 4 8	92 7 8	379 16 2	419 3 11	49 17 6	3,588 11 0
Clarke and Sons, Cambridge	2,304 3 9	398 16 1	102 5 7	305 14 0	401 4 8	51 8 10	3,563 12 11
S. Radhouse and Son, Stotfold	2,271 8 0	412 4 9	85 14 7	344 18 0	377 14 0	48 11 8	3,540 11 0
T. Higgs, Northampton	2,223 17 7	322 17 10	103 16 1	425 12 8	384 14 7	51 16 2	3,512 14 11
G. Bartle and Son, Cotton	2,350 0 0	330 0 0	100 0 0	290 0 0	376 7 8	53 0 0	3,499 7 8
J. Bailey and Co., Ltd., Ashwell	2,246 0 0	377 0 0	99 2 6	325 8 0	402 15 6	47 14 6	3,498 0 0
Treasure Bros., Orpington	2,250 0 0	395 0 0	119 0 0	255 0 0	410 0 0	46 0 0	3,475 0 0
Beardmore and West, Northampton	2,122 0 0	367 0 0	99 0 0	369 10 6	387 0 0	46 13 0	3,391 3 6

Handsworth (Staffs).—For erection of a chapel and entrance lodge at their cemetery at the Leveretts, Handsworth, for the Handsworth Urban District Council:—

W. and J. Webb, Great King Street	£7,721
W. Sapcote and Sons, 87, Camden Street	7,625
J. Dallow and Sons, Blackheath	7,265
F. J. Briley, Hay Mills	7,042
H. Willcock and Co., Darlington Street, Wolverhampton	6,956
F. Johnson, Great Brook Street	6,930
J. Bowen and Sons, Ltd., Balsall Heath	6,733
W. Lee and Sons, Avenue Road, Aston Manor	6,549
F. Rowbotham, Coventry Road	6,451
F. L. Jones, Darlington Street, Wolverhampton	6,409
J. Barnsley and Sons, 102, Ryland Street	6,248
F. H. Smith, 418, Moseley Road	6,230
W. H. Gibbs, High Street, King's Heath	6,100
W. Bishop,* King's Heath	5,999

Rest of Birmingham.
*Accepted.

London.—For enlargement of Queen's Head Street School, for the London County Council:—

A. E. Symes, Stratford	£9,656 0 0
Treasure and Son, Ltd., Upper Holloway	9,468 0 0
Patman and Fotheringham, Ltd., Islington	9,446 0 0
J. Chessum and Sons, 7a, South Place	9,301 0 0
L. H. and R. Roberts, Islington	9,257 0 0
J. and C. Bowyer, Ltd., Upper Norwood	9,195 0 0
T. D. Leng, Deptford	9,180 0 0
Kirk and Randall, Woolwich	9,150 0 0
C. Godson and Sons, Kilburn Lane	9,070 0 0
C. R. Price, 139, Bishopsgate Street Without	9,062 0 0
E. Triggs, Clapham	9,000 0 0
C. P. Roberts and Co., Highbury	8,946 0 0
McLaughlin and Harvey, Ltd.,* 13, Brecknock Road	8,573 17 0

Architect's (Education) estimate, £9,290.
*Recommended for acceptance.

London.—For erection on the "Furzedown" site, Wandsworth, of a secondary school for 456 girls, for the London County Council:—

F. and H. F. Higgs, Herne Hill	£36,034 0 0
W. Downs, Hampton Street, Walworth Road	35,723 0 0
H. Lovatt, Ltd., Wolverhampton	35,281 0 0
J. Smith and Sons, Ltd., South Norwood	35,180 0 0
Leslie and Co., Ltd., Kensington	34,976 0 0
G. E. Wallis and Sons, Ltd., 1, Albemarle Street	34,769 0 0
C. Wall, Ltd., 4, Lloyd's Avenue	34,665 9 8
J. Carmichael, Wandsworth	34,236 0 0
W. Johnson and Co., Ltd., Wandsworth Common	34,083 0 0
Spencer, Santo and Co., Ltd., Kensington	33,884 0 0
J. and C. Bowyer, Ltd., Upper Norwood	33,575 0 0
Holliday and Greenwood, Ltd.,* Brixton	32,475 1 8
J. and M. Patrick, Point Pleasant, Wandsworth	28,700 0 0

*Recommended for acceptance.

Northampton.—For erecting a town and county school, Billing Road. Messrs. Norman and McKewan, architects, 4, Wood Hill, Northampton, Quantities by Mr. G. L. Watson, Newhall Street, Birmingham:—

H. Green	£12,368
R. Cosford	12,199
Hacksley Bros.	12,179
Martin and Co.	11,848
Archer and Co.	11,758
G. Henson	11,735
A. A. Clarke	11,690
E. Green	11,648
W. Heap	11,639
Sharman and Son	11,440
Hickman	11,200
Higgs	10,049
A. P. Hawtin,* Northampton	10,679

*Accepted.

Wealdstone.—For new Council school at Wealdstone, for the Middlesex County Council. Mr. H. G. Crothall, architect:—

Mattock Bros.	£9,160
W. Tout	9,113
C. F. Kearley	9,000
F. Gough and Co.	8,920
W. Lacey	8,908
H. Haynes	8,900
Rowley Bros.	8,806
W. J. Renshaw	8,625
W. J. Dickens	8,496
W. Lawrence and Son	8,422
Treasure and Son	8,384
Knight and Son*	8,140

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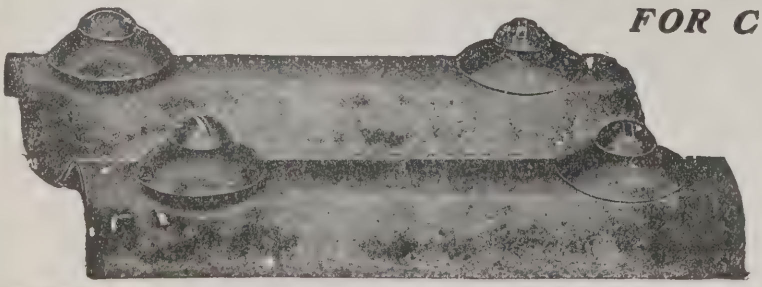

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THE BUILDERS' JOURNAL

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Basement Houses.

One of the speakers at the Health Congress stated that in an ideal city there would be no houses with basements, which help to spread disease, and especially tuberculosis. The disfavour with which basement houses are at present regarded—a fact which is causing great trouble to the ratepayers and corporations of various districts in and around London—is not due, however, to any fear about the hygienic disadvantage, but to the more mundane reasons that it involves more running up and down stairs, and that the basement is especially disliked by servants. The question of running up and down stairs could be quite easily solved by putting in an ordinary or a service lift, a remedy that is practically the rule in London West-End basement houses, always in certain demand because of their situation. The real reason is that the servants, especially if there are only one or two, do not care to live in the basement, and therefore will not stay in a basement house, and as it is easier to get houses than servants, the basement house is becoming a drug on the market. How to convert a basement house is a very difficult problem. Practically the easiest way would be to lower the ground round the house, or put in much larger areas. To put in a false floor makes the ground floor too high, and yet not sufficiently so to allow of a mezzanine. When one considers the very large districts in the London area which are practically covered with suburban houses, it is more or less certain that this problem of the conversion of basement houses will have to be tackled, and the owners of this class of property might do worse than institute a competition for the best method of doing the work.

Improvements?

If the authorities of Croydon have flattered themselves that their ideas of progress would receive an official blessing from the general Press, they must by this time have been disagreeably surprised. Both the daily and weekly papers of all shades of political opinion unhesitatingly condemn the proposal to pull down the Whitgift Hospital, which, as stated by one daily, "is the only building which gives that town distinction." Evidently the words "Progress" and "Improvements" are not so all-sufficing in an argument as they once were. Another "improvement" is the probable removal of the statue of Charles I. at Charing Cross to improve the approach to the new entrance to the Mall. What at first promised to be a very fine entrance seems likely to turn out poorly in result—not through any fault of the architect, but through the stinginess of Government departments, which could not countenance the erection of a purely decorative feature like the Arc de Triomphe at Paris. The Mall arch has been used to provide additional rooms for the Admiralty, and, in consequence, the whole erection is ruined from the architectural and town-planning points of view. As the "Morning Advertiser" leader says: "The Charles' I. statue ought not to be moved merely in order to improve the unimprovable. It is a remarkable fact that our authorities, whether city or municipal, seem to have the most inadequate idea as to the value of old buildings and memorials. When they sweep them away, they always speak of improving things; whereas nothing new in this country is an improvement on the old. It is generally Americans who estimate England's old buildings at their proper value. Every Town Councillor ought to be compelled to spend at least a year in the States, or in the Colonies, in order to learn how to appreciate what he seems to dispise in this country." We do not think that an architect could put the matter better.

Back-to-back Houses.

The controversy on back-to-back houses in the "Yorkshire Daily Post" has assumed extraordinary proportions. So far as Leeds is concerned, opinion is very sharply divided on the merits and demerits of the back-to-back type of house. Though we ourselves are strenuously opposed to any enactment which would encourage or allow the further erection of such dwellings, it would be idle to contend that the protagonists of this type have not made out certain points in favour of it. The principal advantage is the fact that whatever space of ground is allotted to the house, occurs all in one piece, and the miserable back yard and front garden of the average "through" house, too small separately to be of any value, when put together form a respectable kind of yard or garden. The other point which is advanced by many correspondents is that these houses are not so crowded on the land as is the case with the "through" type of house. The rows of houses are 66ft. apart, and one writer states that though "through" scullery houses (by which we take it he means houses with a kitchen-living room and separate scullery) can be built 48 to the acre, other small "throughs" in other towns are built 82 to the acre, and the modern back-to-back only 44 to the acre. The only point about these figures is the apparent generosity of the owners who are content to have only 44 houses to the acre, instead of the 48 or 82 which they might have. If these figures are to be trusted, the Yorkshire owner must be acclaimed as of more generous disposition than the owners in most parts of the United Kingdom. Very much depends on the width of the streets and the back-to-back houses. It is doubtful if legal enactments can decide how much open ground should be left in front of such houses. As regards cleanliness, it is the people more than the houses which are in fault. The question which would naturally arise in most minds is whether the back-to-back type of house gives more opportunities for dirt and neglect than the "through" type of house.

Cottage Dwellings.

It is a sign of the times that at the annual meeting of the Improved Industrial Dwellings Company the Chairman should have felt it necessary to state that the big block tenement was now a thing of the past, and it would not be wise to build more of them. There is no doubt that the public is being so quickly educated to the advantages of cottages on Garden City principles, that it is not likely to want to live in "layers," as one writer not inappropriately terms it. But it is particularly desirable, if we are going to build horizontally instead of vertically, that we should build on some definite plan. In such case, London will spread out in all directions, and if the question of main roads is not carefully considered in connection, it will be almost impossible to get in and out of it by road under half a day's journey. The authorities at Paris, now engaged on the levelling of the fortifications, have a better idea how to do these things. The destruction of the fortifications marks a great change in the building ideas of Paris. It is well known that Paris is a city of flats and that Parisians have been forced to build upwards because of the natural limitations of space set by the fortifications. Now that these are to disappear, the necessity for building flats outside the line of the fortifications disappears. The Garden City Association of France and the authorities are already working on a scheme to devote a large part of the space, formerly covered by the fortifications, for the purpose of public gardens, thus forming a belt of green and trees all around the city. Something of the same idea should be thought out in connection with the spread of London. We have again and again called attention in these columns to the nature of the property which is being put up all round London, and the recent inspection by a Local Government Board inspector at Enfield only emphasises what has already been said. "Before the present century is half through, all round London will exist a network of slums, infinitely worse than those once found in the centre of the Metropolis. These were often overcrowded, but many had the merit of being well and substantially built. It was only the grasping nature of the landlords and the filthy habits of the people that combined to bring them to their evil state. Within a few years jerry-built houses will be uninhabitable. It is impossible for it to be otherwise. A well-built house can be restored, but you cannot do this when the structure is rotten from top to bottom." This intimation of the "Bradford Daily Telegraph" is followed by an enquiry as to what the Health Committee's By-Law Committee and Inspectors have been doing to allow this kind of thing. Probably some of the property in question was erected before the by-laws were properly administered, but much of the bad building is due not to bad material, over which the authorities can exercise some control, but to the bad methods of putting it together, generally due to the fact that the speculative builder sub-lets the work, and fails to exercise due supervision over the men who carry out the various trades on piece-work. In a number of speculative houses lately brought to our notice, the woodwork is perfectly sound, but it might have been cut with a hatchet. The defects in the joints had been made good with stopping, and painted over, and this kind of work was only typical of the rest of the construction.

Representation in the Lords. The proposal, which Earl Wemyss has embodied in two resolutions to be moved in the House of Lords, by which a certain number of peers are to be delegated to represent each of the National Trading and other Societies and Institutions, is a proposal which may have a certain political object, but on general grounds cannot fail to commend itself to the members of the learned professions and organised trades. It is by the Upper House that all legislative proposals should be subjected to a close and scientific scrutiny before they are passed into law; and in the nature of things cautious deliberation and detached survey of the possibilities of legislation cannot be expected in the House of Commons, which is necessarily swayed by the clash of interests and the requirements of party loyalty, inherent defects in all popularly elected bodies. But the Peers should be in a position to give a more mature consideration to the measures that come before them, and to have at command the views of the "organised brains of the Nation" should be of material value in the conduct of their deliberations. Architecture and architects invariably obtain such a poor hearing from our legislative bodies that it is not surprising to find the Royal Institute of British Architects and the Royal Academy of Arts in the forefront of the societies and institutions that approve of Earl Wemyss' idea; and the National Federation of Building Trades' Employers is among the supporters of the movement.

GERMAN DECORATION.

That the German temperament demands very different surroundings to that of the English is very clearly evidenced by the characted of the decoration and furnishing in modern German houses. Readers who have seen illustrations of German interiors will not need to be told how bad the general level of the work is; so bad in fact that it can only be explained by some trait in the national character which is not clearly understood by English people. A writer in the "Westminster Gazette" gives some interesting particulars of the decoration of modern flats which will probably convey to readers not acquainted with German work some idea of the extremities to which Art Nouveau can go. For instance, it is in decorative details that the Berlin architect shows his uncivilised taste, and lack of knowledge of the fitness of things. The underlying idea is that a dwelling-house is something apocalyptic and awe-inspiring. The statuary—and nearly all houses have statuary or carved stone—is always of this character. Some houses boast artificially pitted gargoyles, which might have come from Notre Dame. Others are adorned with sphinxes. Scraggy or enormously fat nude females project from over every second window. Even angels blowing trumpets appear, and one house may be seen with a citation from Bismarck emblazoned in blue and white mosaic on the facade. The top central window of a house is shaped like an enormous mouth, and above this mouth are painted in purple a "Kaiser moustache" and a pair of gigantic eyes topped with gold mosaic eyebrows. The interiors of only the very latest flats are decently decorated, and not many of these. The Berlin decorator can leave nothing alone. You see, for instance, an entrance-hall behind the common door of the flat-house, a hall with walls of plain oak-panelling done in excellent style. But the decorator, for some crazy reason, in some prominent place will have stuck up a highly carved panel with some ugly design, and all the relief parts gilded gorgeously, and even sometimes coloured. Marble is used in many of these halls, but it is almost always gilt in parts, or broken with masses of cheap mirrors, which recall publichouses. The staircases are lighted with stained-glass windows, treated in melancholy Secessionist style. Some of the latest flats have hall-doors painted pale greens and yellows and decorated with coloured bands, silver stars, and other tawdry figures. One I came across had all letter-box slits shaped like drooping mouths. It is, however, the electric lamps in hall and on staircase which show Berlin taste at its worst. The Berlin lamp manufacturer's ingenuity knows no limit. One great hall lamp carries on top an immense pink plaster Nereid seated on a glittering dolphin, from which, instead of fins, project two gigantic imitation stags' antlers, from the points of which, in turn, hang electric bulbs. In another house is a vast chandelier shaped as a tree, on the branches of which sat owls, out of whose eyes gleaned electric light. Underneath hung the strings of cheap green glass beads without which no New Art lamp is considered complete. With all the advance in German education, it is astonishing that such crudeness should still persist.

The interior of the vast majority of these little flats show no more taste, but they meet the needs of the German middle-class, which above all things dreads simplicity, dreads it so much that sometimes you will find an advocate or doctor of good position who will hang strings of dusty artificial flowers across his entrance hall. You will find quite small flats which in the nature of things would be cheaply furnished, the ceilings of which are gorgeously decorated with gilding and colours. The very newest flats show a reaction against this, and some decorators are daring enough to paint their entrance halls a plain white, and leave the ceilings alone—except for an innocent moulding.

Architects of the Day.

III.

Mr. Mervyn Edmund Macartney, B.A., F.R.I.B.A., F.S.A.

Mr. Mervyn Macartney took his B.A. degree at Lincoln College, Oxford, in 1877, whence he proceeded to Mr. Norman Shaw's office. While there he received his first commission to erect some studios in the West End, and from that time he has been busily employed, chiefly in domestic practice.

His name is intimately associated with the revival of the Renaissance tradition. Even during the time he was a pupil with Mr. Norman Shaw, whose practice at that time was entirely in the older tradition, he was a whole-hearted Palladian, and his influence since then has been exerted to cause the dropped threads of this tradition to be gathered together.

We are scarcely able to understand the difficulties which had to be overcome by the pioneers in this work, for to-day the general trend is in the direction of the Renaissance.

The essence of this, as of the classic styles, is proportion, and this Mr. Macartney considers the vital quality of architecture.

It is a small matter, perhaps, but the proportion of glass panes is to him a matter of importance, and this consideration affects the design of the windows themselves, so, in the same way, every feature is considered in relation to the whole. It can be conceived that this view of the Renaissance allows of the utmost simplicity, and many of Mr. Macartney's houses are noticeable by the absence of all whigmalieries and fussiness. In small houses and cottages he is exeremely fond of using an oblong plan with a simple tipped roof over it—quite plain, but possessing an intimate charm and a homelike quality, in marked difference to the self-conscious cottage building that is so much affected in garden suburbs.

While preparing, in conjunction with Mr. Belcher, his most important book, "The Later Renaissance in England," Mr. Macartney cycled over nearly the whole of England, and his wide knowledge of this style is a source of embarrassment to his friends, who, knowing his interest, keep him apprised of their finds, though it is seldom they discover anything not already known to him. It is interesting to know that this book is well considered in America, where it is regarded as a text book.

In the recent revival of the crafts, Mr. Macartney was a prime mover. He was one of the founders of the Artworkers' Guild, and occasionally exhibited at their exhibitions pieces of furniture made from his designs, which are always marked by a playful originality, never *outré*, but with a quiet unobtrusive touch of scholarship. For himself, however, he prefers antique things, and he possesses a splendid collection of old furniture, silver, and china.

A pioneer in many things—in architectural education, in town planning—he was one of the first men to re-introduce architectural planning of gardens. We do not mean formality carried to the extreme, but a considered disposition of terrace, garden wall, pond, and accessories of this kind. Of flowers he is passionately fond, and no garden of his but has its long herbacious border flanking a path.

The garden at Frithwood House, Northwood, near Pinner, is a very good example of his work. It is laid out on a sloping piece of ground, two brick terraces with pleasantly arranged steps are placed in front of the house, and in the axial line is a wonderful bower of roses trained in a quite Oriental fashion, with flower gardens all round and a fish pond at the side.

His recent book on "English Houses and Gardens of the 17th and 18th Centuries," will be fresh in the minds of readers. It consists of a number of illustrations of old houses and gardens reproduced from engravings by Kip and others. His notes display a wide knowledge of the subject.

It is to be regretted that Mr. Macartney has not done more public work. His design for the South Kensington Museum was marked by vigorous simplicity. The front was composed of great masses of masonry in several planes, very severe, but there can be little doubt that it would have made a magnificent building.

More recently he submitted a fine scheme for the Strand Crescent. In these works he displayed an exhaustive knowledge of the Renaissance illuminated with real thought, and inspired by a splendid feeling for proportion.

Unfortunately, his houses—a number of them in the neighbourhood of Tunbridge Wells—are not easily accessible, but they are all restful pieces of architecture.

In many counties, he has built in the vernacular, in brick, in stone, tile, and slate, with consummate mastery of his materials. And many of his houses to-day look as if they were part and parcel of the country-side they adorn. One of the early houses, "Kent Hatch," Westerham, is a large, half-timber building, evidently inspired by Mr. Shaw's work. "Court Hayes," Oxted, another early work, in brick and stone, has a fine architectural terrace. "Shandon," Tunbridge Wells; "Champions," "Scearn Bank," "Sandhills," are large houses all in Surrey.

Bussock Wood, near Newbury, the subject of our centre plate, is a recent work of Mr. Macartney, and has been built for Sir M. F. Montagu-Pollock, Bart. It is situated on some rising ground a few miles to the north of Newbury, close to the remains of a British camp. The south front commands fine views over a hilly country, and through a gap in the trees the tower of Newbury Church can be seen. The main entrance, on the north side, approaches the house at right angles through a thick wood. The walls are built of a local red brick, with dressings of Portland stone, and the roof is covered with old tiles. The eaves cornice is of wood. The gardens are being laid out in a formal manner; the fish pond is shown on the view of the south front. The forecourt is surrounded with walls, but the photograph was taken before they were built.

"Swaylands," Kent, is a huge place, the front extending for 500 ft. Mr. Macartney added the conservatory, picture gallery, etc. He built a new boarding-house at Bradfield College, in a quiet Georgian style.

"Welders," at Chalfont, St. Peters, Bucks., is an extremely interesting building. The front consists of three gables with rounded tips, very cleverly designed. Mr. Macartney has also built farmhouses in Kent, Somerset, and Sussex.

At Angley Park, near Cranbrook, Kent, he built several gate lodges, cottages, and made additions to the house. The house is some sixty years old, and a very poor piece of architecture. Mr. Macartney's work was entirely in the interior.

Frithwood House, Northwood, near Pinner, is a quiet, Georgian house in brick and tiles, very simple and effective. A town house of Mr. Macartney's can be seen at 167, Queen's Gate.

The house at Woolhampton, which is now illustrated, is on the point of completion, and is Mr. Macartney's third home. Readers of the "Builders' Journal" will remember the interiors of his first house at 52a, Berkeley Square, which was published April 13th, 1904, and of his cottage at Silchester Common, published March 23rd, 1904.

Some three years ago Mr. Macartney was appointed the surveyor to St. Paul's Cathedral, and we may rest assured that this, our finest building, is in safe keeping. Soon after his appointment the decorative schemes suddenly stopped. Some recent work of his may be seen in the Chapel of SS. Michael and George, where a new reredos in oak, marble steps and bronze gilt altar rail have recently been installed from his designs.

A useful development of the practice of published measured drawings is the "Practical Exemplar of Architecture," which Mr. Macartney started some years ago in the "Architectural Review," and in which the measured drawings are accompanied by explanatory photographs. The idea of the Exemplar is to teach students and others the relation of architecture by its geometrical representation. The older architects seemed to know intuitively the weight of mouldings and cornices, etc., at various levels, but the present generation cannot without great experience understand this.

Mr. Macartney has many activities. He is an examiner to the Board of Education, also a member of the Board of Architectural Education. Mainly through his efforts and through his researches into the system of architectural education in America, our own system has been largely remodelled, and will, doubtless, be further improved. He is also a member of the Council of the Royal Institute of British Architects, and figures on the Prizes Committee. Following the Editorial Committee of the "Architectural Review," of which he was a member, Mr. Macartney became the Editor of that magazine, a position he still holds. He is also a vice-president of the Architectural and Topographical Society, and a member of Town Planning and other committees. In architectural politics he is an anti-registrationist; and in sport is particularly fond of the good old game of bowls.

It is not only in his work that Mr. Macartney upholds the best tradition of English architecture: his relations with his builders, with his assistants are all marked by consideration and courtesy, and the consequence is the creation of an *esprit de corps*, and a unanimity of ideals, which make for good work.

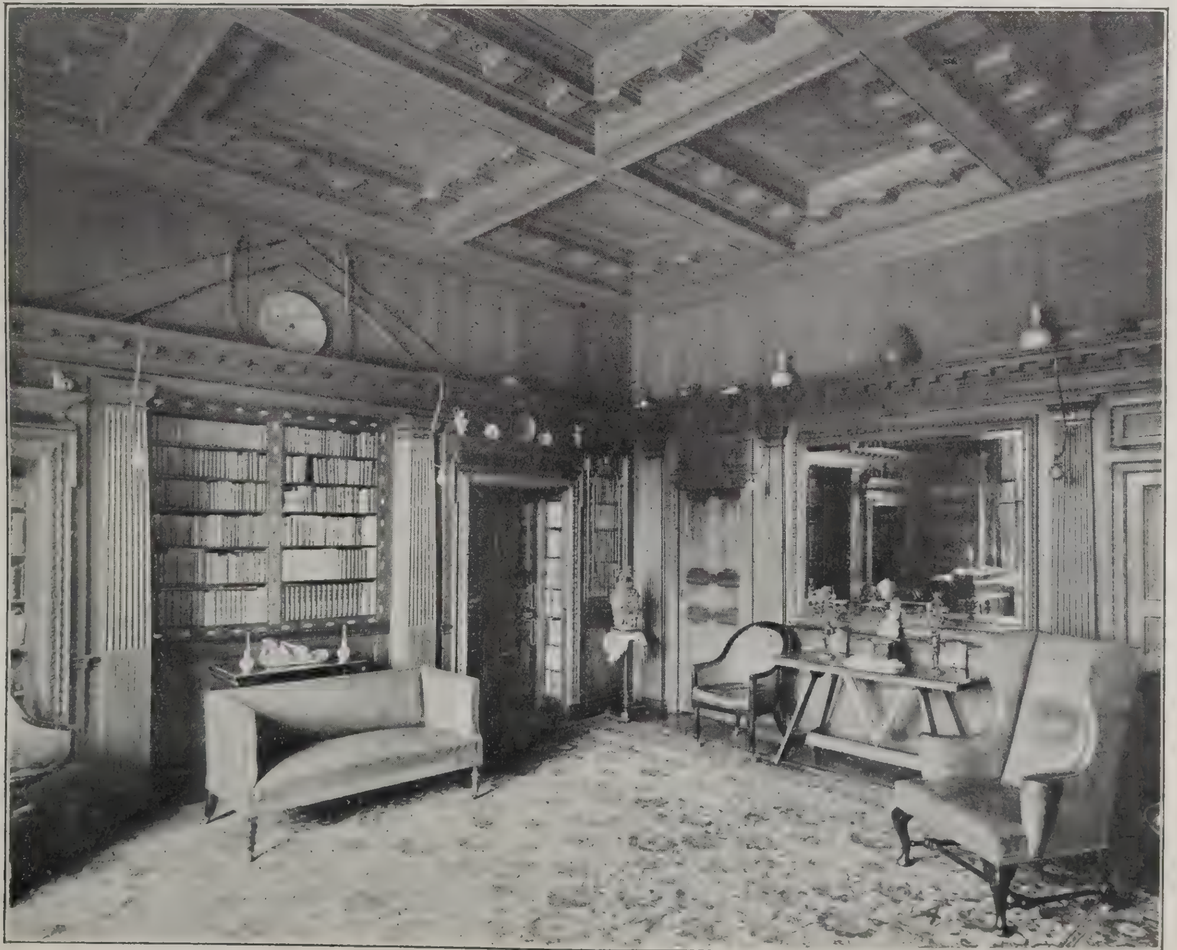


Photo: T. Lewis.

ALTERATIONS AT ANGLEY PARK, CRANBROOK, KENT. THE SMOKING-ROOM. MERVYN E. MACARTNEY, F.R.I.B.A., F.S.A., ARCHITECT.

The Smoking-Room is one of the principal rooms in the house. The ceiling is of cedar, and the walls are lined with unpolished Spanish mahogany, the doors being polished.

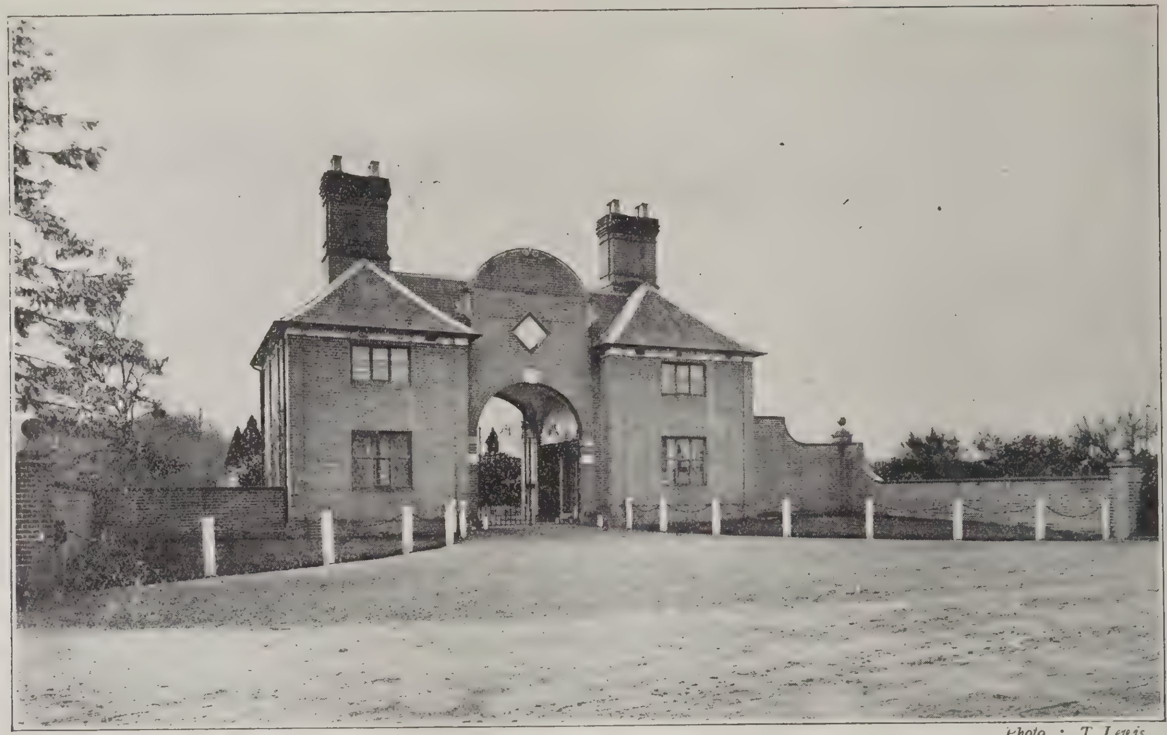


Photo : T Lewis.

PRINCIPAL LODGE, ANGLEY PARK, CRANBROOK, KENT. MERVYN E. MACARTNEY, F.R.I.B.A., F.S.A., ARCHITECT.

This is the principal entrance to the estate, the walls being faced with local red bricks, with dressings of Bath stone. The gates are of wrought-iron, and the roofs are covered with old tiles.

THE ECOLE DES BEAUX ARTS.

Its Teaching and Its Influence on American Architecture.

By Paul Cret.

The poor Ecole des Beaux Arts has been the cause of a great deal of writing in America in the past few years. Criticisms, complaints, denunciations are heard everywhere. If an architect, too skillful for his competitors, wins a competition, it is the fault of the Ecole. That the Renaissance, happening in the fifteenth and sixteenth centuries, superseded Gothic, which was old and no more in harmony with the new ideas of men of this period, is the fault of the Ecole. That the generation of artists of the three following centuries were so much in error as to keep on in this way, following out the spirit of the Renaissance, is the fault of the Ecole. What difference does it make if these artists did create masterpieces? What difference does it makes if they did have no prejudices, and that, though they were nearer the spirit of the thirteenth century than we are, and still had the same skilled workmen (which we have not), they nevertheless broke away from the old forms of their own free will. They were wrong, every one of them—or so it has been decided by the critics, who without a doubt alone have a sane judgment, the true artistic method, and, I hope, the way of using both of them.

Meanwhile the Ecole, which is the pretext for all the noise, looks calmly over the river that reflects the Louvre, the water-jet in the courtyard of the Murier springs serenely from its ivy-covered basin, and Poussin and Puget stand calmly oblivious on either side of the entrance gates. Amid these almost cloistral surroundings the students go to spend a few years of a new life, laugh, become enthusiastic, and start in every direction to try in many different countries to put into lasting form their aspirations and personal qualities—high, it may be, or vulgar, ingenious or commonplace.

The critics accuse; the Ecole does not answer. Its function is to give to those who ask for it the only thing a school can give—a method of work. It makes no effort to bring people to its classes; it prints no advertisements, no circulars filled with promises. Its purpose is not to defend nor to promulgate any special theories. The right to teach is the right of everyone at the Ecole—provided, only, he can obtain a sufficient number of followers. And he may teach what he pleases. A newcomer may open an atelier to teach Oceanian or Romanesque, or be a fanatic in Art Nouveau or Tudor—the Ecole does not object. His pupils have selected him, and are following him because they want him, and only so long as they want him. It is the most liberal organisation I know. It was an American who said, some years ago, to one of the professors of the school: "What differentiates your school from those I saw in Italy, in England, and in Austria, is its complete liberalism; the way in which a pupil here is treated as a man—as a man who has the right to select his own master, to choose his own artistic way."

Fifty years ago, at the time of the reaction in favour of the Middle Ages, due mostly to the deep researches of Lassus, Viollet le Duc and others, influential people tried to diminish this liberty by creating a regular course in æsthetics, with examinations—that is, to impose on all students a certain appreciation of beauty. The professor selected for this chair was Viollet le Duc—whose ideas on modern architecture, while excellent for a few, were very bad for the majority. As the pupils of the Beaux Arts are between twenty and thirty years of age, they are no longer schoolboys; and the most of them have the necessary culture to admire what is worth admiring without being told when to admire. There was a sort of revolution, the Government gave way, and only those who wanted to, took the examination in æsthetics. Since then every course, apart from the scientific and technical courses, is optional—and the student does not have to subscribe blindly to any formulæ.

To discuss the methods of the Ecole is, then, a task as endless as the one of the Danaids. The professors are many, and when one dies or retires his place is taken by a younger man with very different ideas. The principles of the Ecole are really those of contemporary French architecture. The professors are nothing more than architects following honestly their profession, with varying success. The only point in common between them is devotion to their art and to their teaching—which is not for them a profession.

As for the pupils, their object in life is not to obtain the Prix de Rome. It is to become more proficient in their profession. But those who obtain the Prix de Rome (who are said with some disdain to have simply proved that they are past masters in scholastic theories and able to teach them to others) are first of all architects, some of whom have built in France buildings whose perfection of study, care in construction and perfect adaptation to modern needs have made them the types of Nineteenth Century Architecture.

We are too near to give recognition to men like Labrouste, Duc, Coquart or Vaudremer; or, rather, most writers on art have not the necessary clearness of mind to appreciate what makes an architectural work a masterpiece, but are largely influenced by the opinions of other people, which they simply adopt as true. That is of small importance; papers do not prevail against monuments, and artistic criticism is the most ridiculous thing to read fifty years afterwards.

That there is a French influence in modern American architecture is true beyond a doubt. The influence does not date back for the last decade, but has been apparent for thirty years at least—to say nothing of the first influence, too rapidly checked, which produced the plan of the city of Washington, and inspired some southern buildings.

Some may wonder that the importation was made without a protest from the general public. "If anyone had attempted to import the railroad system from France, or the banking system, the thing would not have passed so easily. Is it not, then, time to stop and consider?" they ask. Yes, but the importation of French architecture came about because there was a need for it. There would be no point in importing the French railroad system, when the American system, which developed simultaneously with it, is perfectly adjusted to American needs and ideas. But in architecture there is something more in France than in America. The simple fact that it has been brought in without a single protest from the general public is proof enough that the general public could not get along without it.

At the same time the United States was importing formal architecture from France, they were borrowing domestic architecture from England—which is a new proof of what is somewhat compulsory that, in these importations, a nation goes in different ways to different countries to bring back what it wants.

It is remarkable to one who does not satisfy himself with a superficial study of art to see how a power greater than the reason of the individual seems to regulate these transactions—to see how in the Sixteenth Century France borrowed from Italy what it needed to rejuvenate its art—and that without abdicating the smallest portion of her national originality; for I do not believe that anyone conversant with these questions can find a similarity between the French Renaissance and the Italian other than in mere detail or ornamentation.

At the origin of every art there is a foreign influence—no art is national from its beginning. I would be ashamed to write so evident a truth if I had had no opportunity to read monthly dissertations in which it seems to be ignored. The Greek architecture was borrowed, the Roman architecture, the Gothic—but that takes nothing from their glory, which is to have assimilated heterogeneous elements and to have wrought them into a harmonious whole.

In my window one winter I had some tulip bulbs from which I was expecting an abundant bloom of flowers with the first March sun. The green stems came up, but when they reached their full development the buds did not open. Like a poor gardener I had forgotten to let the bulbs stay in the shade to delay their opening and give the roots time to accomplish their work underground, in order that the plant might later on have the necessary strength to bloom. I ask my contemporary not to do as I did. Remember that from having broken too soon the artistic intercourse with Europe, American architects killed Colonial architecture which was so full of promise. They are at work again, accumulating material from France, England, and Italy. The assimilation is going on, the bloom cannot be far off—but you must be patient. Fifty years for the formation of an art does not correspond to five years in the life of a man; and he does not show very strong personality when he is but five years old.

No one can change these laws, which are deeper than the human will. Nobody imposed French architecture on the United States. It was of their own free will that hundreds of Americans went to Paris and that thousands more took their inspiration from the ideas they brought back. Were all these men fools?

What were they looking for in France? and what did they bring back? Documents would have answered the purpose—besides which the importation of forms comes as largely from Italy and England as from France. Then it must have been something more. It was composition and design. The methods now in use all over the United States in the universities, by means of which those who have something to say are enabled to say it clearly, are those of the Ecole. It is there that the real French influence is found. The science of design is not all that it requisite to the professional man, but it is essential to him in order to make himself clear. The more important the subject the more is felt the need of design. But even in a cottage, where a little taste, a little common sense, a little originality, and a sense of the picturesque are enough to create a charming piece of work, these same qualities, unless accompanied by the science of design, result only in disorder, lack of dignity and in a building which is practically bad.

This quality of clearness—the science of harmonious results necessary to design—where could it be better studied than in France? Where could be found a group of men of equal culture and with the same willingness to give up their time, where could be shown so complete a set of representative buildings as in Paris? There is no modern programme that has not there an excellent translation. Other cities have more beautiful work, or a more complete ensemble of monuments of a certain period, but Paris can show types of all periods—which includes the best existing group of modern buildings, theatres, railroad stations, markets, prisons, libraries, and museums.

The Ecole develops in an admirable way the study of design, respect for the programme, and a research of a special character proper for each kind of building. It is as a result of this that in merely looking at a building designed under such principles, one knows immediately its purpose, simply because its plan and elevation correspond to its needs, and it is executed throughout with a respect for artistic truth. The comparison of architecture to-day in the United States with that of twenty years ago shows clearly to every fair-minded man the salutary results achieved by French training for American students.

The greater part of my contemporary's paper was devoted to ridiculing the method by which design is taught. It will seem strange to the reader that such childish methods as he describes should result in the beautiful work they have admired. Here is the reason for this contradition:

A writer speaks of the danger to American students of getting in Paris simply formulæ devoid of sense, and a stock of atelier slang instead of French methods of thought. Discredit has been thrown on the Ecole des Beaux-Arts by such men who, through ignorance, did not catch the spirit of the wonderful training.

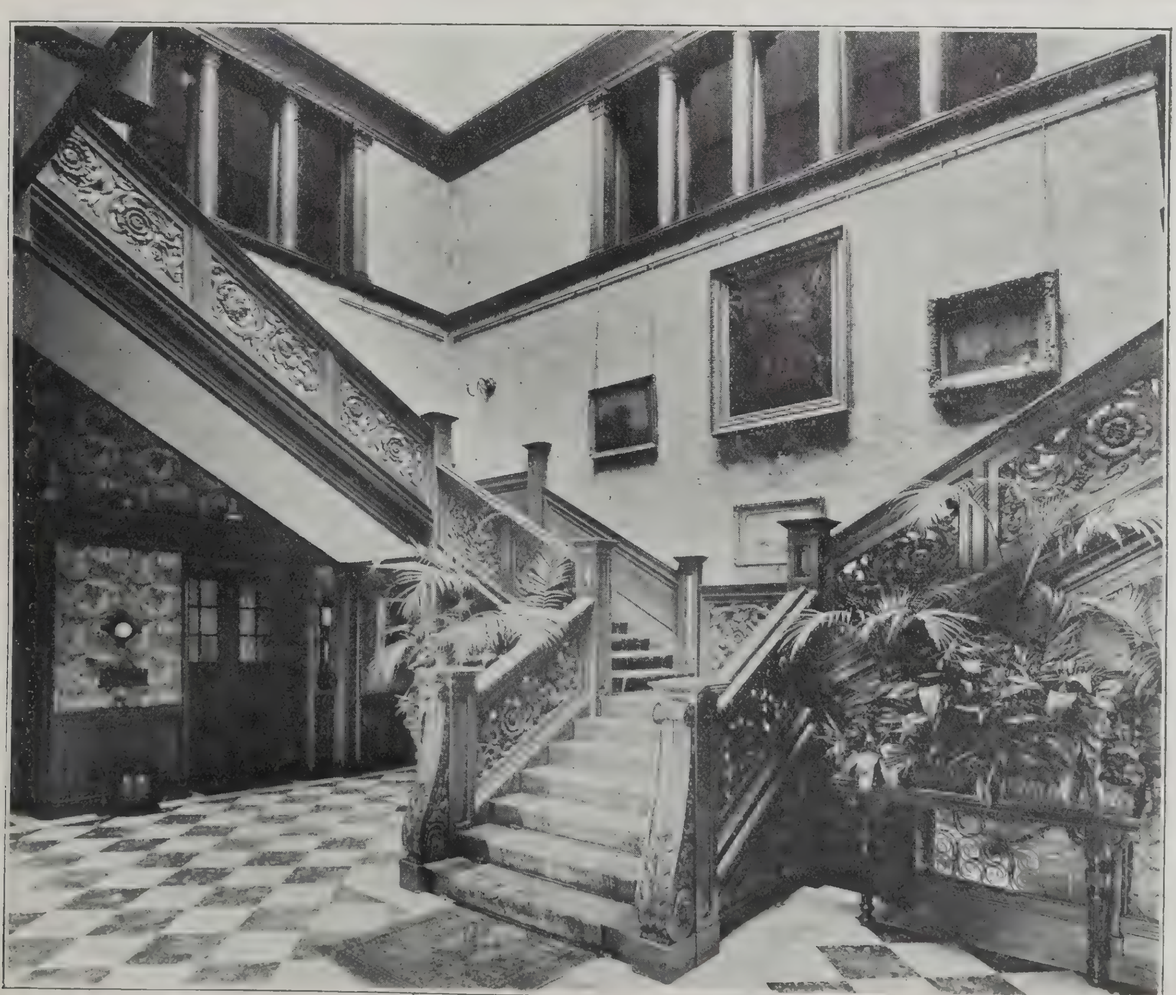


Photo: T. Lewis.

ALTERATIONS AT ANGLEY PARK, CRANBROOK, KENT. THE STAIRCASE. MERVYN E. MACARTNEY, F.R.I.B.A., F.S.A., ARCHITECT.

The staircase is of oak with a carved and pierced balustrade. The marble floor is paved with squares of Verde Antico and bastard statuary

A contemporary saw a "meaningless performance" in the spinning of lines, circles, and grey tones which were to become a plan, he could not see that it was the work of the brain directing it. He was looking at the movement of the fingers, believing in good faith that in this were all the methods of design. Of course, he asked the reason; and as it is sometimes difficult to tell why we do one thing more than another, on account of the complication of things that determined our choice, he was answered with one of those ready-made sentences, the sort of professional slang that the students of the Ecole, or some of them, like to use, because they are short and often avoid long explanations. These he promoted to the rank of canon, of magic formulæ, permitting anyone, professional or layman, to design, "while you wait," anything from a bishop's residence to a railroad station in a Chinese town.

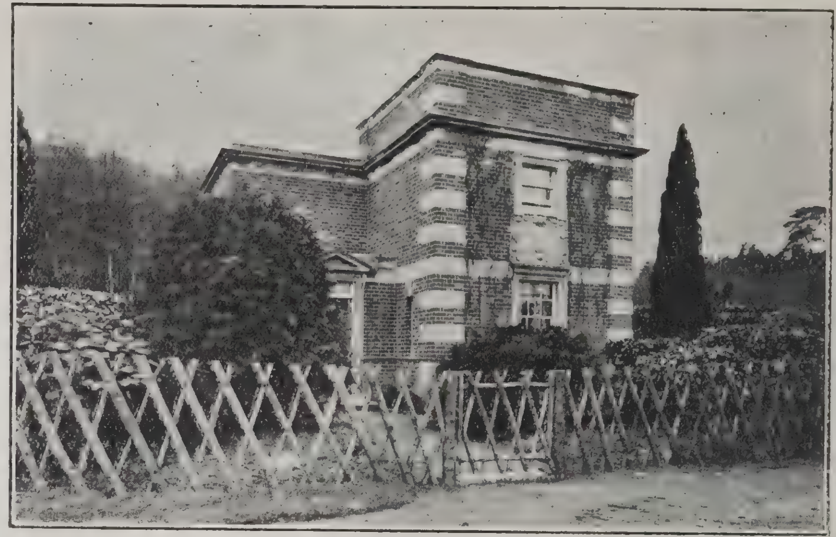


Photo: T. Lewis.

LODGE AT ANGLEY PARK, CRANBROOK, KENT. MERVYN E. MACARTNEY, F.R.I.B.A., F.S.A. ARCHITECT.

This, the second of the lodges erected from Mr. Macartney's designs on this estate, is faced with local red bricks and Bath stone.

My contemporary is witty enough not to take offence at the joke played on him by his companions in Paris, in saying there is such a series of formulæ. In the school problems there is such a constant change that it would soon outgrow any set of formulæ. One may notice in the book of competitions for the Prix de Rome, which dates as far back as 1797, a change every ten years corresponding to the change in the art of the period.

It is not the Ecole which creates the architecture of Europe. It is the architects. The students are only pupils following the impulse given by the masters. A great mistake in America has been to take as types the work of students. Whereas the French are more critical and have realised so thoroughly the immaturity of such work that they apply the term "school architecture" to all productions which have good qualities but are undeveloped. It is fair to say that no man produces an architectural work that is representative of himself before he is forty. The complexity of architectural study is responsible for this, and it is only when the different parts of the profession have been mastered that real work can be accomplished.

"The students in the school are taught to plan too much with their eyes," says a critic. Others are planning too much with figures, and of the two excesses I prefer for young men the first. Practical requirements will soon enough cut the wings of his dreams, but something will remain. It is necessary at one period of every man's life that he shall believe that the object of architecture is to produce beautiful things. Those who, during their youth, had only in mind four-foot lightwells instead of Boboli gardens will not in the end do better architecture—even for lightwells.

There are other sweeping accusations. One of these is the elasticity of the school programmes. I have often seen in the United States and elsewhere competition programmes of fifty or a hundred pages, which one had to study for three weeks before starting to design. Now, if one admits that a student can learn how to design by doing one problem a year, let him have such programmes — with all survey information, climatic changes, cost of building and so on. If, on the other hand, one believes it is necessary to have designed much in order to design well, in the same way that one must have painted a great deal to be a painter and that three studies from life, ever so careful and complete, do not accomplish that, the objection is of no value.

Objection is taken more than once to the phraseology used by the Patrons in the ateliers. For instance, a statement taken exception to I discover to be no more nor less than that the situation of a building should have a large influence on the way it is planned—a principle certainly true, if not very startling.

If these formulæ or means of expression were not in sympathy with our critic's way of thinking, and he was going to Paris to study the methods of the school, he should have looked for these methods at the lectures or in the book of the only man who has authority to give them out in the name of the school. Instead of noting without understanding them the sentences which occur in the ateliers (that every intelligent student knows to be only a sort of cloak covering either results or experiments) and processes in presentation of plan, which have no importance to anyone but the newcomer—why did he not read Guadet's book, "The Elements and Theory of Architecture," which is the only authorised document on the modern teaching in the Ecole in the last fifty years. By simply reading the chapter entitled "General Principles," he would have seen that there is no need for complicated

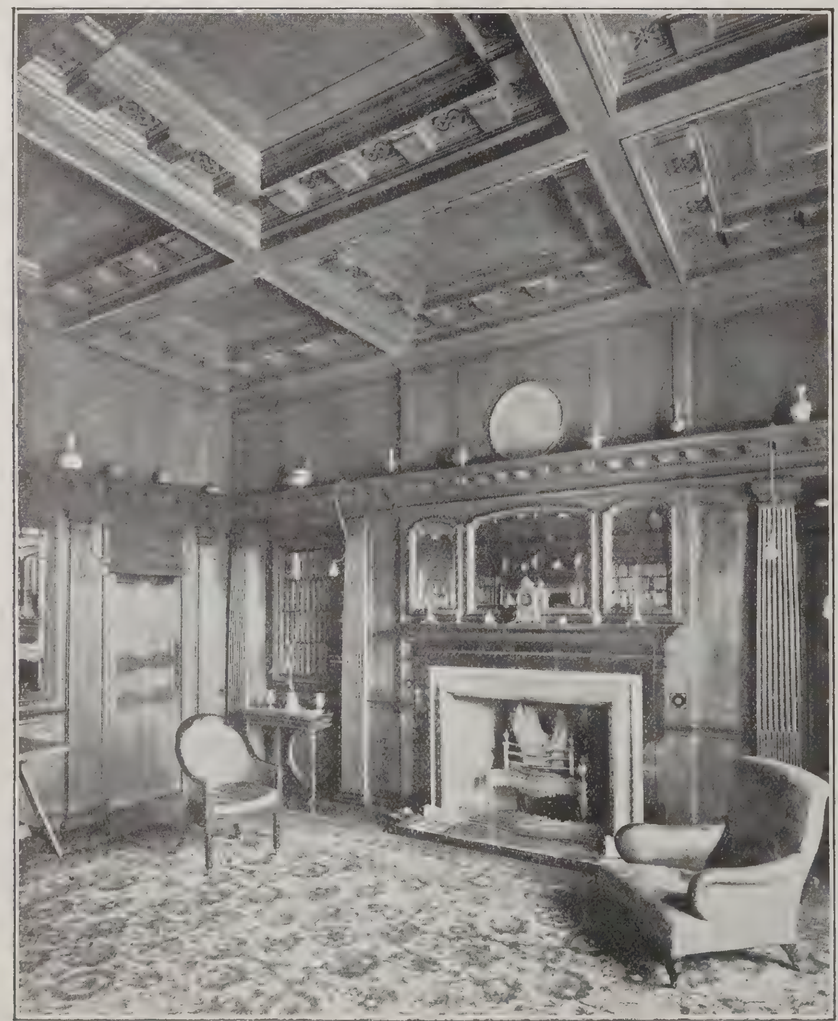
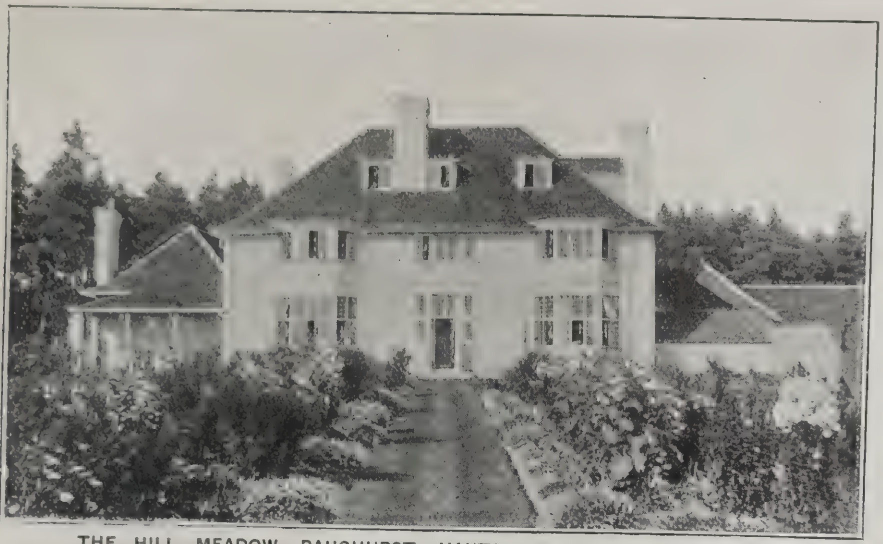


Photo: T. Lewis.

ALTERATIONS AT ANGLEY PARK, CRANBROOK, KENT. THE SMOKING-ROOM. MERVYN E. MACARTNEY, F.R.I.B.A., F.S.A., ARCHITECT.

This house is old and of a poor type of architecture. Mr. Macartney's work consisted of alterations and decorations and the erection of new lodges and cottages.



THE HILL MEADOW, BAUGHURST, HANTS. MERVYN E. MACARTNEY, F.R.I.B.A., F.S.A., ARCHITECT.

This is one of Mr. Macartneys essays in rough-cast, and an exceptionally pleasing house in quiet and simple lines. Our view shows the garden in a more forward state of development than with some of the other houses illustrated here.

words to express what we have all been looking for in the Ecole, and the truths we have taken for a basis. It would have been fairer, in writing of the Ecole, to have taken quotations from such a book, instead of relying on personal impressions, which are subject to the same suspicion as memoirs to the historian. He would have found that what we try to do in making a beautiful plan is not to make a picture. "You must understand by a beautiful plan," writes Guadet, "a plan which allows and is apt to give beautiful things, beautiful interiors, and beautiful facades. Yes, there are beautiful plans—I find the expression perfectly legitimate—but in the same way as there are beautiful books, beautiful by what you can read in them."

Further on (page 134), Guadet sums up the principles of design as he taught them, and as the others—Pascal, Daumet, Laloux taught them to us:

"1. You must be faithful to your programme, be familiar with it; and also see correctly what is the character to be kept in the building.

"2. The ground, location or climate, can modify absolutely the expression of a programme.

"3. All architectural composition must be constructible. Every inconstructible scheme is absurd. Every scheme of construction more difficult or complicated than necessary is mediocre or bad.

"4. Truth is the first requirement of architecture. Every architectural untruth is inexcusable. If in some cases one of these untruths is overlooked on account of the ingenuity and ability shown in the building, the impression given, nevertheless, is of an inferior art.

"5. Effective strength is not sufficient—it must also be apparent.

"6. Designs proceed by necessary sacrifices. A design must be good first of all, but it must also be beautiful. You must compose then with a view both to the utility and beauty of the building. And, as an element of beauty, you will try to obtain character by variety."

The Workington Town Council propose to purchase land for a new technical college and a public park, in Napier-street, as an open space and two fields, at a total cost of £2,395.

* * *

The president of the Royal Institute of British Architects has written to the City Corporation placing the services of that body at their disposal in matters connected with a proposed new bridge over the Thames and the variation in the gradients of Southwark Bridge, and inviting the Corporation to receive a deputation from the Royal Institute on the subject after the vacation.

* * *

The office of the Chief Inspector of Reformatories and Industrial Schools has been removed to Charles-street, Parliament-street, owing to the approaching demolition of various buildings in Great Scotland-yard. Among these are the premises which were originally the chief office of the Metropolitan Police Force. A large block with frontage to Whitehall-place is also to be pulled down, and notices of an auction of the old materials are posted on the walls.

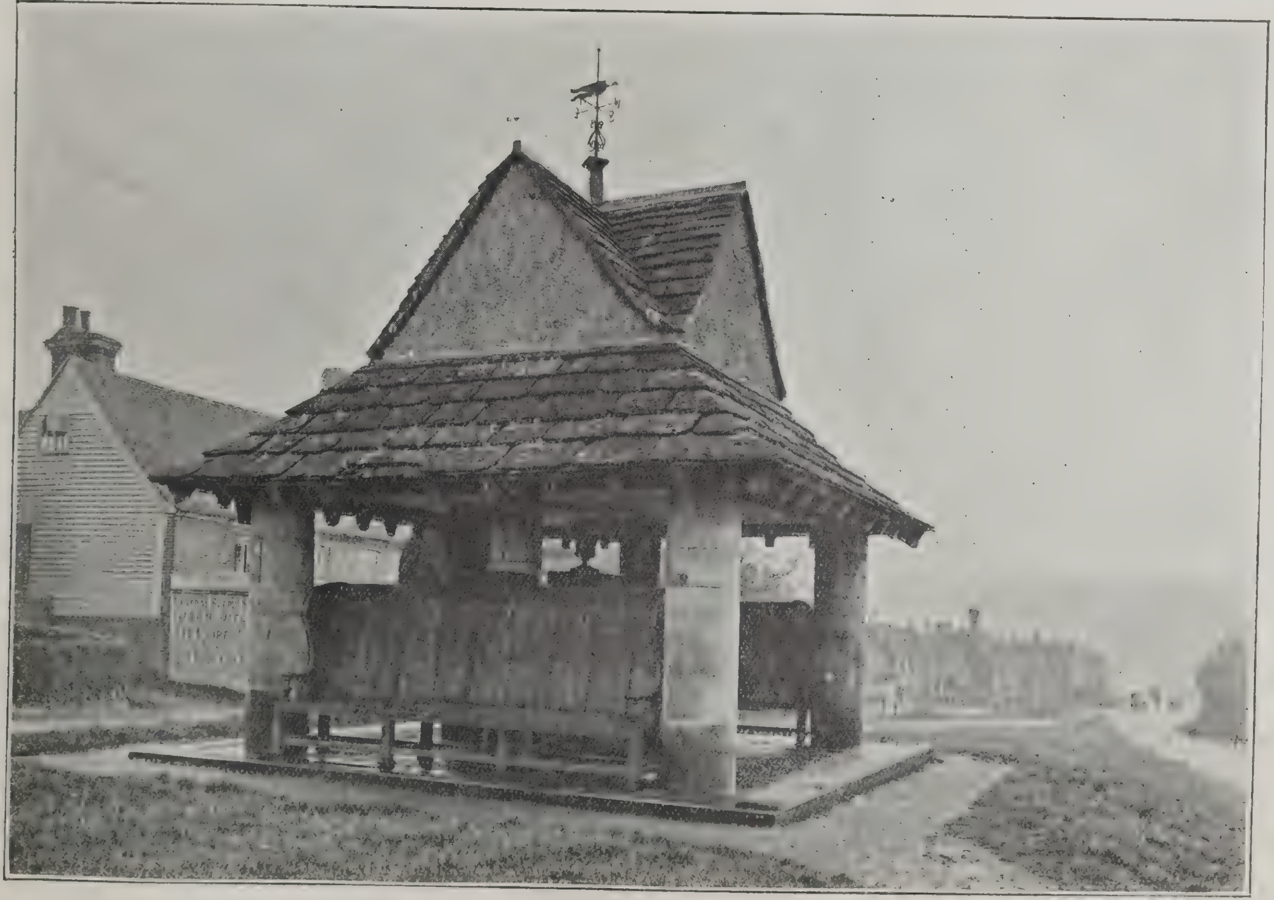


Photo: Architectural Review Photo Bureau.

THE PUMP HOUSE, SEDDLESCOMBE, SUSSEX. MERVYN E. MACARTNEY, F.R.I.B.A., F.S.A., ARCHITECT.

This pump-house, which stands on the Village green, has pillars and slates of local stone. The pump is of lead, with cast decoration of cherub's heads, etc., the floor is paved with pebbles, and the seats and woodwork are of oak.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns

Calculation for Steel Girder.

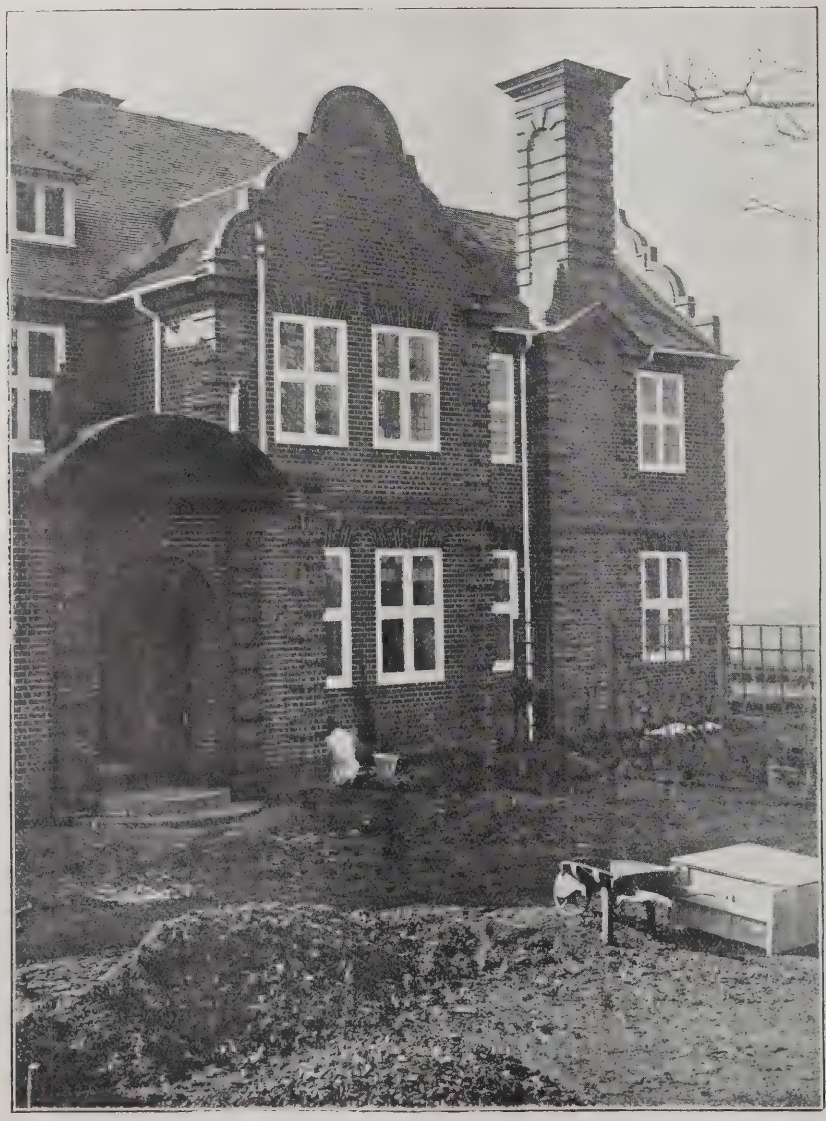
In answer to "Edinburgh" in the "Builders' Journal" recently, your correspondent "A" apparently neglects the flange angles in calculating the flange section. In this particular case the area would be obtained most economically by using two 6in. × 3½in. × ⅜in. angles, giving 6.45 sq. inches of net section or 6.848 sq. inches of gross ditto. Angles are cheaper than plates, and when they afford the necessary section both the expense and the loss of section involved by two rows of rivets are saved. Rivet holes being punched ⅛in. wider than the shank, the deduction for rivets should be either 1in. holes for ⅞in. rivets or ⅞in. holes for ¾in. rivets. ⅞in. rivets are very seldom necessary. In this case with a depth of 3ft.. and a maximum shear of 15 tons, it will be found that ¾in. rivets 4in. pitch would afford ample bearing area even in 5-16in. web.

PERCY J. WALDRAM.

Removing Paint from Oak-work.

CONGLETON.—C. R. H. writes: "What is the best method of removing old paint and varnish from some old oak framing without disturbing the grain, discolouring, or injuring the wood in any way?"

If you use a good paint and varnish remover you will have no trouble with raising the grain, and the wood will not be in any way injured. Probably the best paint and varnish removers on the market are "Pintoff" and "Pyrol." Both of these are made in a paste form. They are applied with a brush and allowed to stand for five to fifteen minutes according to the thickness of the paint to be removed. They do not injure the hands or require any preparation in the removing, excepting a little wiping down with a rag moistened in benzine or turpentine. Ball's paint remover is another excellent article, slightly different in character, and is particularly fitted for removing varnish. J.



HOUSE FOR DR. H. W. GELL, WOOLHAMPTON, BERKSHIRE. THE ENTRANCE FRONT.
MERVYN E. MACARTNEY, F.R.I.B.A., F.S.A., ARCHITECT.

Local red bricks are used for the walls throughout, with the exception of the porch, which is built of rubbers. The main cornice is built up of moulded bricks; old tiles are used for roofing and tile-hanging of upper part of walls of of servants' wing. The style of the gables was adopted to suit the client's wishes.

MR. MACARTNEY'S SECOND HOME AT SILCHESTER COMMON.

A distant view of the cottage which Mr. Macartney is vacating for his new house at Woolhampton, illustrated on p. 116. This cottage was illustrated and described in "The Builders' Journal" for March 23rd, 1904.

Valuer's License.

BRISTOL.—E. V. writes: "Is a valuer's license necessary to value a pair of villas for mortgage, and if not, what, if any, stamp duties are payable. I would suggest that if you will give the questions of the altered subjects in the current R.I.B.A., examinations, you will be benefiting a large number of your readers."

An appraiser's licence costs £2 per annum, but it is quite unneeded for the purposes of any valuation which is made for the information of one person only (as in the case of a mortgage, or for probate purposes); a valuer's license is only needed when the valuation is to be made between two persons, and partakes therefore of the nature of an award.—F. S. I. [As to the suggestion of our correspondent, we have anticipated it by arranging for two or three articles on the subject. These will appear shortly.—ED.]

Fumigating Oak in Situ.

LANCASHIRE.—"THOROUGH" writes: "Some choir stalls were fitted in a chancel two years ago; they are of oak, Austrian and Dantzig, and were beeswaxed. It is now required to fumigate them to match some similar work in prospect. Can this be done; if not, what is the best alternative?"

You cannot fumigate this work unless you can enclose the stalls in something of the nature of a box, and this would probably be impracticable. You had better remove the beeswax by means of hot turpentine, and then apply a stain, thinning it as may be necessary to match the new work. A suitable stain can be obtained from any dealer in painters' materials. J.

Gantry Girders.

GLASGOW.—"Crane Girder" writes: (1) Taking, for example, the case of a ten-ton electric overhead traveller, with a span of 60ft. centres of rails, the wheel base will be, say, 10ft., and the maximum load on the end carriage=say 22 tons=11 tons on each wheel. The maximum bending moment for two concentrated loads will either occur with one load at centre of span, or when both loads are on the girder and placed so that one of them is at ¼th the wheel base to either side of the centre span of girder. Please make clear at what ratio of span to wheel base the change takes place, and also what is the maximum BM. when the wheel base is exactly half span of girder. (2) What should be the proportion of depth of girder to span for girders of this type, so that the deflection may not be excessive, and what width should the flanges be in terms of span

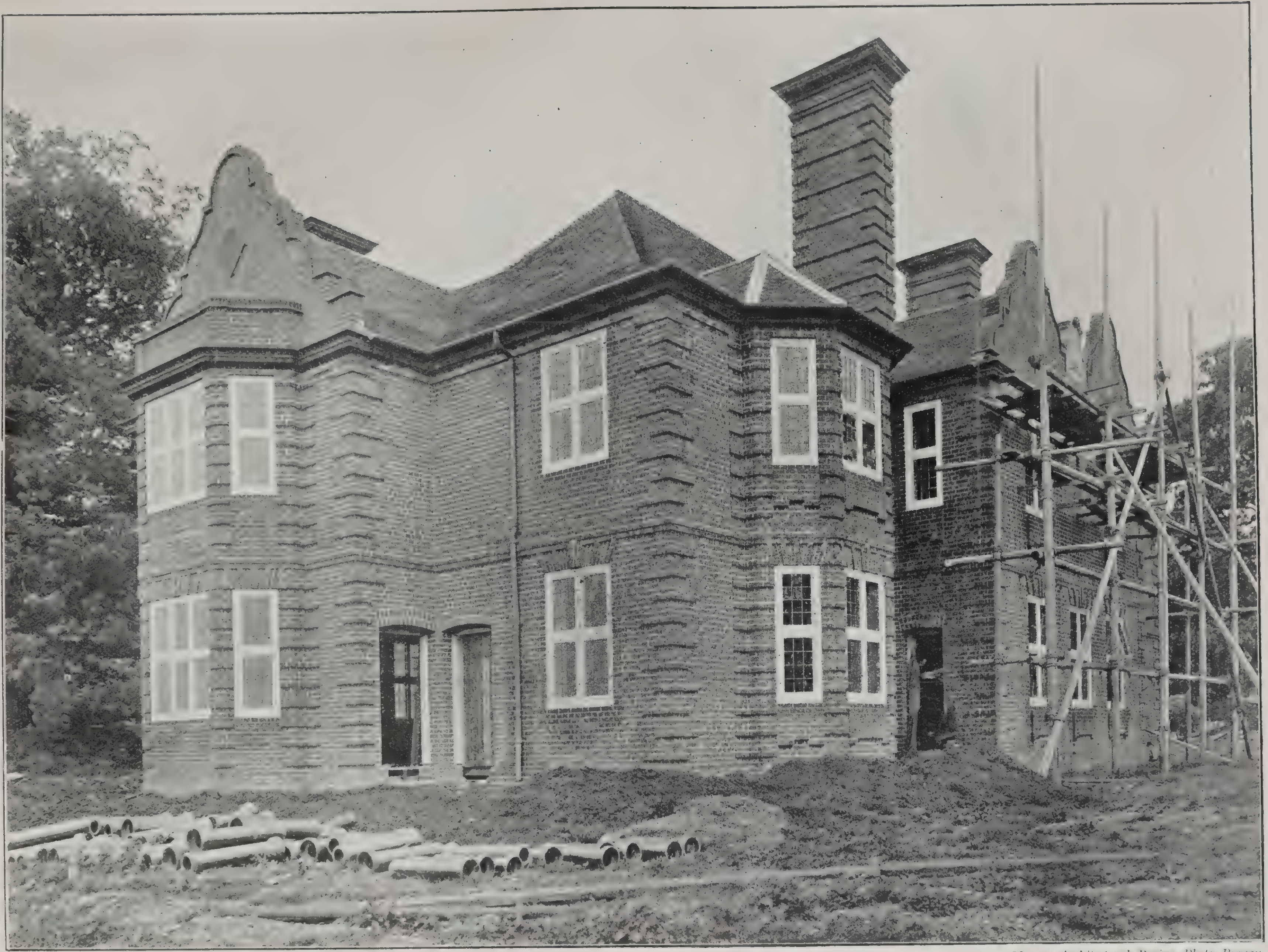
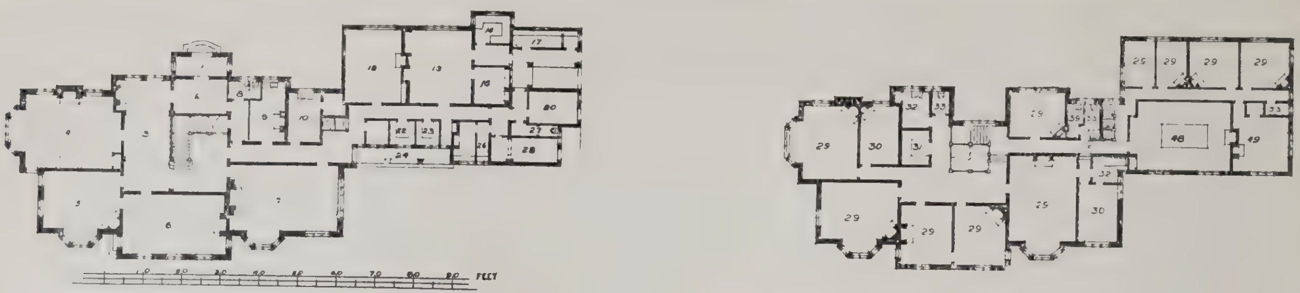


Photo: Architectural Review Photo Bureau.

HOUSE FOR DR. H. W. GELL, WOOLHAMPTON, BERKSHIRE. GARDEN FRONT. MERVYN E. MACARTNEY, F.R.I.B.A., F.S.A., ARCHITECT.

This house is situated about six miles to the east of Newbury, Berkshire, and stands on the brow of a hill overlooking the Valley of the Kennet. It commands many fine views in nearly all directions. The view was taken before the erection of the terrace, which now extends along the south and west sides.



HOUSE FOR DR. H. W. GELL, WOOLHAMPTON, BERKSHIRE. PLANS. MERVYN E. MACARTNEY, F.R.I.B.A., F.S.A., ARCHITECT.

1, Porch ; 2, Entrance Hall ; 3, Hall ; 4, Drawing-room ; 5, Morning-room ; 6, Library ; 7, Dining-room ; 8, Lavatory ; 9, Butler ; 10, Pantry ; 12, Servants' Hall ; 13, Kitchen ; 14, Larder, 16, Scullery ; 17, Dairy ; 20, 28, Coal ; 22, 23, Store ; 24, Loggia ; 26, Boots ; 27, 33, W.C. ; 29, 49, Bedroom ; 30, Dressing-room ; 31, Linen ; 32, Bath-room ; 48, Billiard-room.

(i.e., unsupported length) to give sufficient lateral stiffness? (3) What factor of safety should be used, and what shearing and bearing stresses for the rivets should be used? P.S.—What are the usual proportions for depth at centre and ends of fish-bellied crane girders?

(1) Let two weights, each equal to W and at distance l apart, pass over a girder of span L. Then, if the loads are both on the span, it can be shown that, at any point at distance y from one end of the girder, the B.M. will be a maximum when one of the loads reach the point. (See equations 5 and 8 on p. 189 of Andrews' "Theory and Design of Structures," putting W=W2=P=½W.)

$$\text{Then } M=\frac{W\left(y-\frac{l}{2}\right)(L-y)}{L}$$

$$\text{This is a maximum when } \frac{dM}{dy}=0$$

$$\text{i.e. when } L-2y+\frac{l}{2}=0$$

$$\text{i.e. } 2y=L+\frac{l}{2}$$

$$\text{or } y=\frac{L}{2}+\frac{l}{4}$$

i.e. when one of the loads at $\frac{l}{4}$ from the centre of the span, the other being on the other side of the centre.

$$\text{Then } M=\frac{W}{L}\left(\frac{L}{2}+\frac{l}{4}-\frac{l}{2}\right)\left(L-\frac{L}{2}-\frac{l}{4}\right)$$

$$=\frac{W}{4L}\left(L-\frac{l}{2}\right)^2 \quad \dots \quad \dots \quad (1)$$

If now only one load is on the span, the max. B.M. at any point occurs when such load reaches the point and the maximum

$$B.M.=\frac{WL}{2\cdot 4}=\frac{WL}{8};$$

this occurs when the load is on half the span. If this is equal to (1)

$$\frac{WL}{8}=\frac{W}{4L}\left(L-\frac{l}{2}\right)^2$$

$$L^2=2\left(L^2-Ll+\frac{l^2}{4}\right)$$

$$L^2-2Ll+\frac{l^2}{2}=0$$

$$2L^2-4Ll+l^2=0$$

$$\frac{L}{l}=\frac{4+\sqrt{16-8}}{4}=\frac{4+\sqrt{8}}{4}$$

$=1\cdot707$. (The + value is the only possible one. If therefore $l=\frac{L}{2}$, the maximum value will be given by equation (1) viz :

$$M=\frac{W}{4L}\left(L-\frac{L}{4}\right)^2=\frac{9WL}{64}$$

(2) Depth of girder may be the same as for ordinary plate girders, say $\frac{1}{10}$ to $\frac{1}{12}$ span. The breadth of the flange should be such that the compression flange may take the compression due to the B.M.+direct compression due to friction when pulled up by brakes. (This may be taken as ⅛ load on the wheels ; some authorities give .18 load.) Try breadth $=\frac{\text{span}}{30}$ and check back by Rankin's formula. This friction load should be allowed for in calculating the section as regards compression. (3) The question of factor of safety is a moot point. Theoretically for rolling loads the stresses should be about one-half those for fixed loads. I think that satisfactory stresses would be 5 tons per sq. in. for tension and 4 tons per sq. in. compression ; and for the rivets 4 tons per sq. in. in shean and 8 tons per sq. in. in bearing. The depth at the ends varies usually from one-half to two-thirds that at the centre. The consideration of getting a workable pitch of the rivets at the ends often really determines this in practice. A.

Board of Education Examination.

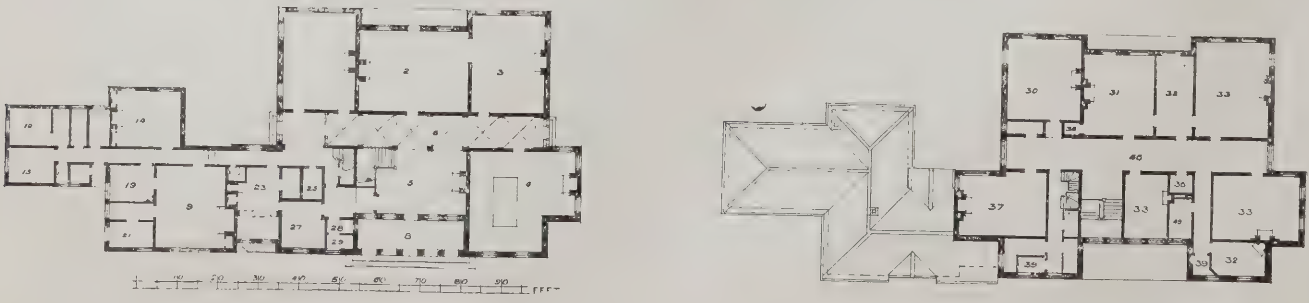
BRENTWOOD.—J. D. S. writes : "Are the answers to the Board of Education Building construction published ; if so, can you tell where I can get them?"

Answers to the papers set at the examinations of the Board of Education are not issued officially. The papers themselves are published by Messrs. Eyre and Spottiswoode, all the science subjects being issued in one publication, price sixpence. During 1903, however, complete, fully-illustrated, model answers to the building construction papers of the Board of Education set that year, appeared in the following issues of this journal, viz. : Elementary stage, May 20th ; advanced stage, May 27th ; honours stage, part I., July 8th ; honours stage, part II., September 23rd, and 30th. These numbers should certainly be referred to by our correspondent, as they indicate quite clearly the scope of the examination in each of the several stages. B. and B.

Withdrawing a Tender.

LONDON.—X. Y. Z. writes :—"A.B. is a builder who tendered for the erection of a house. He was pressed for time in making out his tender, and had to return the specification with the tender. Consequently he had not any further opportunity of going over the specification and checking his figures. His tender was found to be the lowest, and was accepted, and he signed the contract before checking his estimate. When he did so, he found that he had made a mistake of over £100, which would involve him in heavy loss. He has asked to be allowed to withdraw from the contract, and has proffered the difference between his tender and that of the next man, and £5 in addition to cover expenses. There is a penalty clause as to time."

A.B. is in a position of some difficulty. While a tender may be withdrawn at any time before acceptance (see "Emden's Building Contracts," 4th edn., p. 23), it cannot be withdrawn after that date. In a Scotch case, the principle of which is applicable in England, a builder made a tender to do certain work for £859. This tender was accepted. He afterwards found that, owing to a clerical error, the offer was £826 less than it should have been. In an action for damages for breach of contract, it was held that the building owner was entitled to succeed (Seaton Brick Co. v. Mitchell, 1900, 11 F. (5th ser.) 550 ; Ewing v. Lawson, 1900, 16 T.L.R. 140). Having regard to these cases, it seems that A.B. is committing a breach of contract. The measure of damages for the breach of a building contract has been said to be "the difference between the contract price of the work or building contracted for, and the cost of making the work con-



BUSSOCK WOOD, NEWBURY, BERKSHIRE. PLANS. MERVYN E. MACARTNEY, F.R.I.B.A., F.S.A., ARCHITECT.

1, Dining-room ; 2, Drawing-room ; 3, Library ; 4, Billiard-room ; 5, Hall ; 6, 46, Corridor ; 8, Entrance ; 9, Kitchen ; 10, 15, Coals ; 14, Servants' Hall ; 16, 29, 39, W.C. ; 19, Scullery 21, Larder ; 23, Butler ; 25, Store ; 27, Gun-room ; 28, Lavatory ; 30, Nursery ; 31, Study . 32, Dressing-room ; 33, Bedroom ; 37, Night Nursery ; 49, Bathroom.

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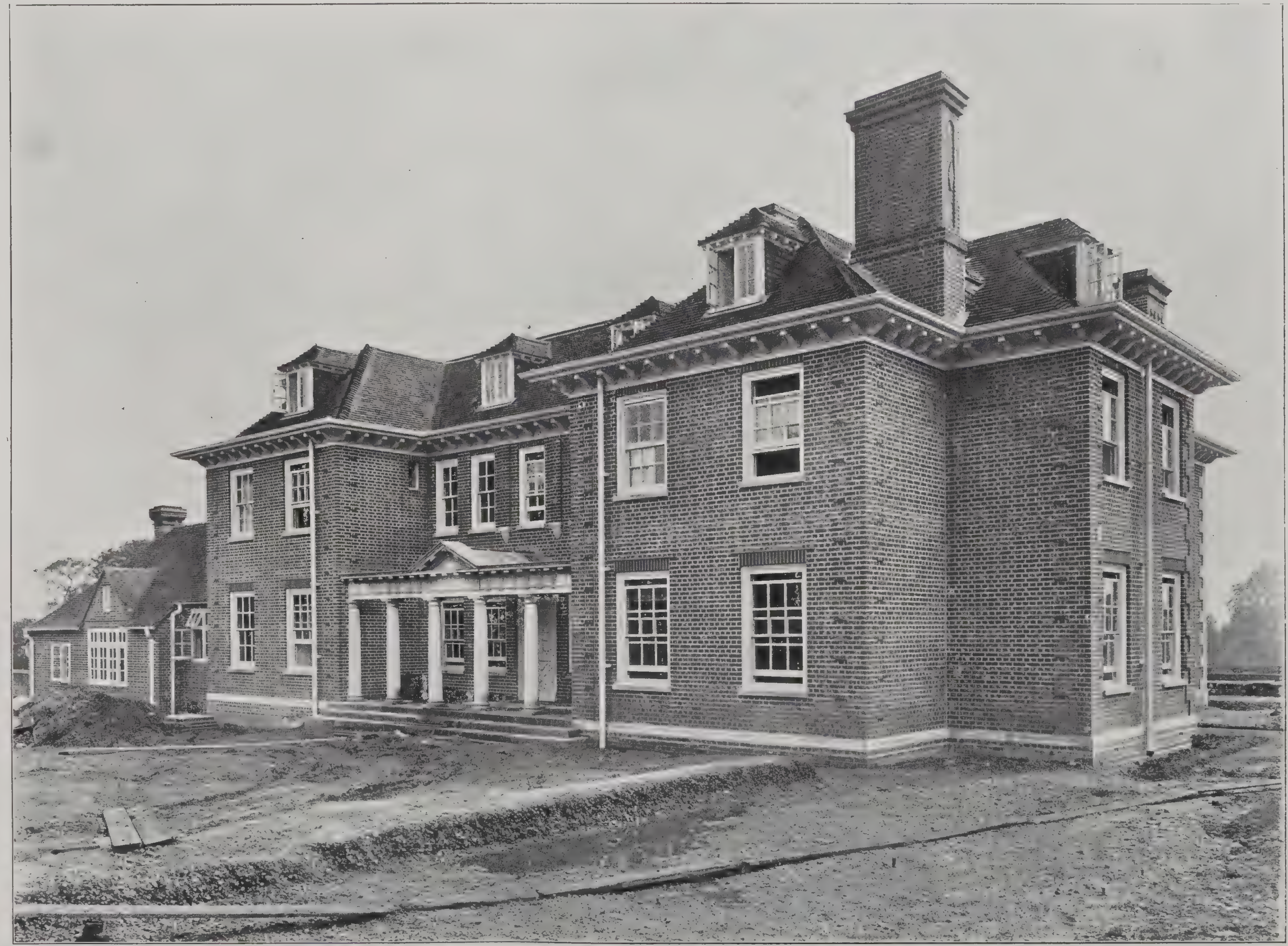
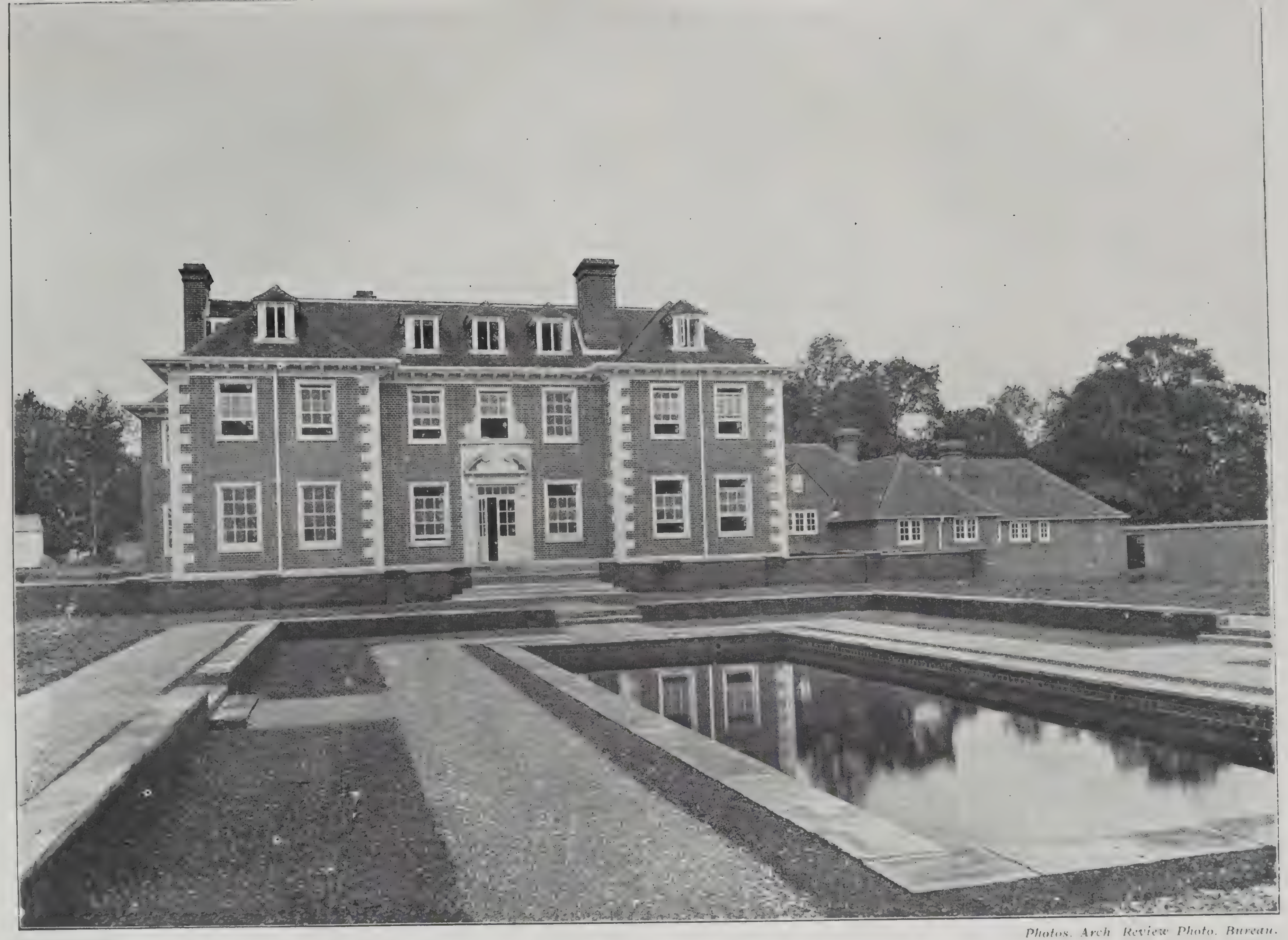


Entrance Front.



Garden Front.

Photos. Arch Review Photo. Bureau.

BUSSOCK WOOD, NEWBURY, BERKSHIRE. MERVYN E. MACARTNEY. F.R.I.B.A., F.S.A., ARCHITECT.

ırm to the contract, plus the loss of earn-
ıg power or uses during the delay." So
ı the present case, the damages recoverable
ill be the difference between A.B.'s tender
ıd the reasonable cost of carrying out the
ork in a similar manner. The building
wner will not be compelled to accept the
ervices of the builder whose tender was
ext on the list. With regard to damages for
elay, these may be assessed at the actual
amage suffered, or else at the amount re-
erred to in the penalty clause. If A.B. has
ecided not to do the work, his best course
ill be to give notice of the fact at once.
n such a case the building owner cannot
ile up the damages against the building by
elaying the employment of another builder.
hould an action be brought, a judicious
ayment into court may effect a saving of
osts. A.B. should consult a solicitor with-
ut delay.

BARRISTER.

Constructing Reinforced Concrete Floor.

CALCUTTA.—YOUNG ARCHITECT writes: "I
ave a number of small rooms, 16ft. by 8ft.,
n a building, and wish to make the floors of
einforced concrete constructed with round,
ron bars. Could you inform me how to cal-
ulate the depth of concrete required, also
he size and number of bars? What text-
ook would you recommend for showing
ow to take out the above-mentioned stresses
t various spans?"

In reply to our correspondent's inquiry as
o the calculation of reinforced concrete for
he floors of small rooms, we would recom-
nend him to obtain the R.I.B.A. rules for
alculations in reinforced concrete, issued in
ı report some time ago, and obtainable from
he Royal Institute of British Architects, 9,
Conduit Street, W. We would also suggest
hat our correspondent obtained "Reinforced
Concrete," by Messrs. Marsh and Dunn,
ublished by Archibald Constable and Co.,
Ltd., London, price 31s. 6d.; or "The Prin-
iples of Reinforced Concrete," by Turneaux
ınd Maurer.

Acoustics.

BIRMINGHAM.—A. C. H. writes: "I am interested in the contemplated erection of a building to be used primarily for a dining hall, but also as a concert and lecture hall. The provision of a building for dining purposes presents little or no difficulty, but as a concert hall there is the all-important factor of acoustic properties. Many buildings have been erected with the aid of expert advice and in accordance with what the science of acoustics has to teach, which in the end have proved unsatisfactory for the rendering and hearing of music. Not unnaturally I feel it very desirable at the outset of a project to build such a hall to obtain some knowledge with regard to recent buildings in the country erected for a similar purpose and at not too great a cost, and I should be glad if you could inform me: (1) Who are the leading experts on acoustics as applied to buildings, who might be consulted if desired by the owners of the hall. (2) What and where situate are the large buildings put up in recent times that will fulfil the foregoing conditions and what is the opinion held of their acoustic properties. (3) Any suggestion which you could offer as the solution of the above problem would be appreciated."

The subject is a vast one and the fund of information of the slightest. You should obtain "Sound in its relation to Buildings," by H. W. Burrows, F.G.S., reprinted from the journal of the R.I.B.A., and obtainable at 9, Conduit-street, London, W., price 1s. In reply to the detailed questions: (1) I know of no professed expert on acoustics; but Mr. H. H. Statham, F.R.I.B.A., or Mr. E. A. Rickards, F.R.I.B.A., might be consulted as to the musical properties of concert halls. (2) The Aeolian Hall, Bond-street, London, is believed to be very satisfactory, also the Queen's Hall, Langham Place, W., the Philharmonic Hall, Liverpool. (3) A perusal of the paper previously referred to will probably prove helpful. The question is too wide for a detailed reply here.

Writing Specification.

EXETER.—J. S. writes: "What would be a fair charge for writing a specification for a large secondary school (304 places), contract price about £9,500? The specification included preliminary and general, all trades, and heating, lighting, etc., as well as tar-paved yards, tennis courts, boundary fences and approach roads, and runs to many pages of closely typewritten matter. By writing, I mean preparing the draft, the actual type-writing was done out. An early reply will oblige."

The number of pages in the specification, which would have afforded some clue to the amount of detail given, is unfortunately omitted in the query, but if a fully detailed specification such as might serve the needs of the quantity surveyor and contractor is intended, and not an outline specification accompanying a competitive scheme, a fair charge would be about ½ per cent. upon the cost of the work, unless of course the querist has also prepared the quantities when he might accept less if he is paid the full 2½ per cent. for quantities.

G.

Indoor Bowling Saloon and American Bowls.

PLYMOUTH.—H. W. writes: "Will you kindly advise me as to materials and construction for the floor of an indoor English Bowling Saloon. Also American bowls."

I do not quite know what is meant by an indoor English bowling saloon unless it is the old "skittle alley," in which the game of skittles or "nine-pins," known in olden times as kails, is played. I cannot trace any rules of the game governing the width of the alley, but suggest 4ft. wide as being suitable for the track. A square mitred

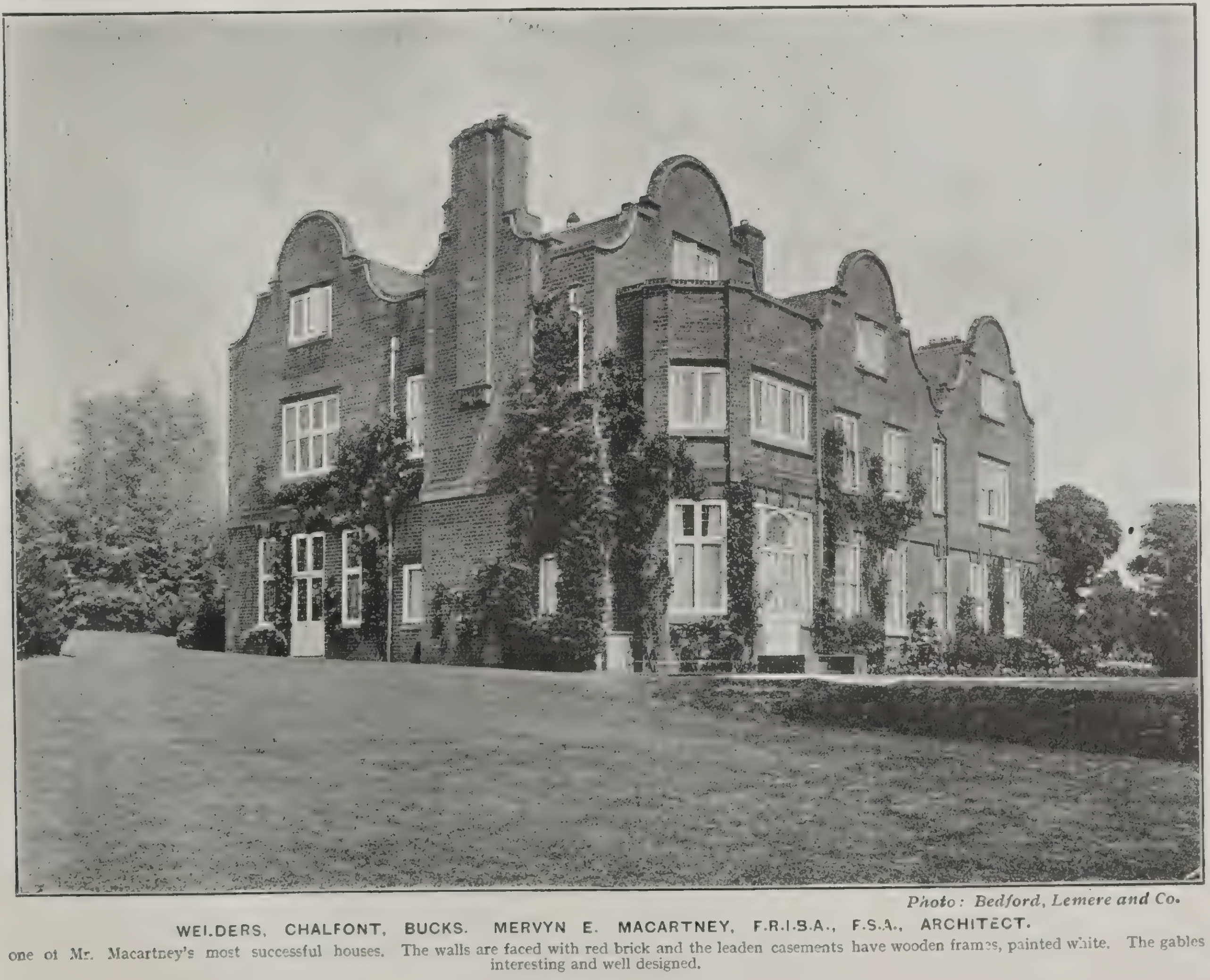


Photo: Bedford, Lemere and Co.

WELDERS, CHALFONT, BUCKS. MERVYN E. MACARTNEY, F.R.I.B.A., F.S.A., ARCHITECT.

This is one of Mr. Macartney's most successful houses. The walls are faced with red brick and the leaden casements have wooden frames, painted white. The gables are very interesting and well designed.

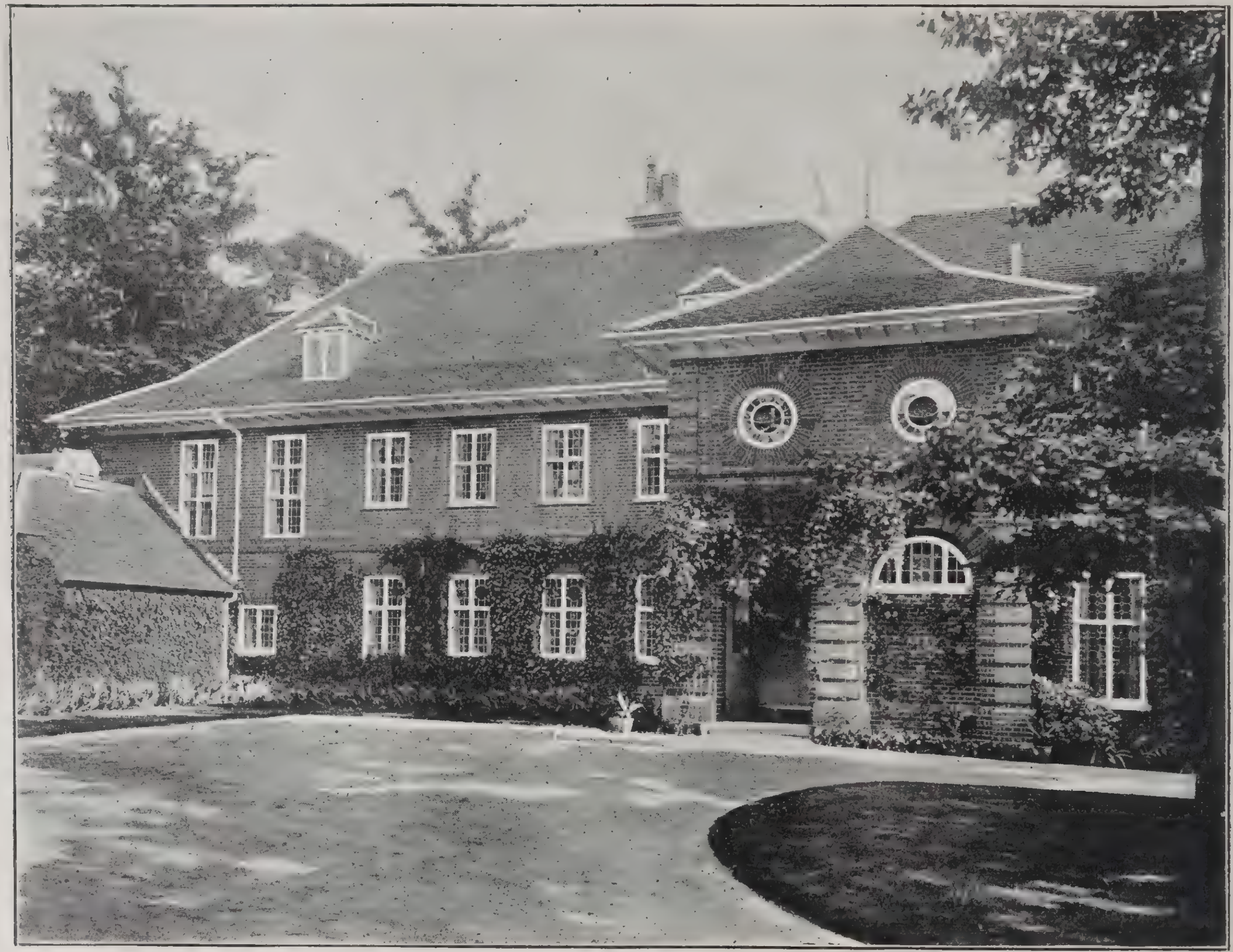


Photo: Bedford Lemere and Co.

FRITHWOOD HOUSE, NORTHWOOD. ENTRANCE FRONT. MERVYN E. MACARTNEY, F.R.I.B.A., F.S.A., ARCHITECT.

This is a quiet Georgian house, faced with red brick and roofed with red tiles. It is modelled on very simple and effective lines.

frame is let in flush with the flooring at one end, so that one diagonal lies along the centre line of the alley, in which the pins, about 12in. long and weighing from 7lbs. to 9lbs. each are set up. The length should be sufficient to allow 21ft. from the bowling point to the nearest pin. On one side of the alley an inclined wooden trough should be formed to enable the balls to be returned by gravity to the throwing point. The slightly flattened spherical balls are made of lignum vitæ, and weigh from 10 to 14lbs. each, so that some hard wood should be used for the floor such as maple, 2in. thick, in widths of about 4ins. and with the joints longitudinal with the alley. An oak kerb, 3in. by 6in., should be formed on either side to keep the balls within bounds, and a timber screen about 2ft. high around the end. The game of American bowls resembles skittles, and the general construction of the alley is the same. The game is played with ten pins instead of nine, the alleys are 60ft. in length by 4ft. wide. The pins are set up in the shape of an equilateral triangle with the apex towards the player, and the frame or "platform" should be shaped accordingly. The rules of the game are given in "The Modern Pocket Hoyle," New York.

Henry Adams.

Some improvements are being effected at the Guildhall, London. The coat of paint on the pillars of the hall is being removed, and the crypt has had the masonry walls cleaned and electric light installed.

* * *

Mr. Edward White, Vice-Chairman of the London County Council, who has been selected as the Unionist and Tariff Reform candidate for the Radcliffe-cum-Farnworth Division of Lancashire at the next General Election, is a native of Marylebone, where he was born in 1847, and where he carried on for many years the business of a builder.

* * *

Earl Wemyss has written to the Press concerning his proposal for the representation in the House of Lords of National Trading and other societies and institutions. The proposal has been well received by a number of important bodies, among them the following: Royal Institute of British Architects, Royal Academy of Arts, Society of Authors, Building Trades Federation of the United Kingdom, Society of Engineers, Gas Companies Association, London Chamber of Commerce, Machinery Users' Association, Royal College of Physicians, Railway Companies Association, Royal Sanitary Association, The Shipping Federation, The Surveyors' Institute, The Employers' Parliamentary Council (representing 30 Central Associations connected with the chief industries of the United Kingdom). The proposal is embodied in the two following resolutions which Earl Wemyss is to move in the House of Lords, which will, he believes, if adopted, make that House representative of "the organised brains of the nation, irrespective of party." The two resolutions are as follows:—(1) That in the opinion of this House, it would be for the public good that important national trading and other representative societies should each name three members of the existing Peerage, in the current and each succeeding Parliament, to speak and act on behalf of such societies on all questions in which they are interested, and that the names of the Peers so nominated be entered in the Journals of the House. (2) That the Lord Chancellor, the Marquess of Lansdowne, the Earl of Crewe, and the Earl of Halsbury be empowered to determine what societies are of sufficient importance to be admitted to the said privilege of nomination.

Mr. W. R. Hearn, the British Consul-General for San Francisco, reports that the rebuilding of the city made steady progress during the past year. Over £7,000,000 was spent in buildings and alterations, and the new structures in the business part of the city are immeasurably better than those which were destroyed. Plenty of hotel accommodation has been provided, and more travellers can be housed than before the disaster. The Chinese portion of the city, which was formerly a nucleus of filth, is now a model of cleanliness. The suburbs of San Francisco have profited immensely by the disaster, which settled a large population among them. The residents in these districts have accomplished great results by their concerted action. They have, generally speaking, pushed along street improvements, artificial lighting, street railways, and all other necessaries, so that the suburbs, which develope so rapidly, are places of comfortable abode supplied with all the conveniences of older residential districts.

* * *

A series of experiments have been carried out at the Arthur D. Little Laboratory of Engineering Chemistry, Boston, Mass, to demonstrate to what extent the burning of illuminating gas increases the amount of sulphur gases while ventilation is maintained at the usual standard of air purity. The result has been to show that the sulphur dioxide is absorbed by the plaster, and the greater the sulphur dioxide content the quicker the rate of absorption. The action continued even when the plaster was covered with paper, but less rapidly. The sulphur is quickly absorbed at the surface, and it is stated that a ceiling 10ft. by 8ft. will neutralise for some centuries the sulphur products produced by burning 25 c.f. of gas per day when the gas contains 20 grains of sulphur per 100 c.f.

ARCHITECTS OF THE DAY III. MR. MERVYN E. MACARTNEY, B.A., F.R.I.B.A., F.S.A.

Sketched from life by our Special Artist.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

Buildings in Progress and Completed.

ABERTILLERY. — The Trustees of Powell's Tillery Institute, Abertillery, are contemplating the addition of a swimming bath to their gymnasium, and Mr. F. R. Bates, architect, of Newport, has been consulted on the matter.

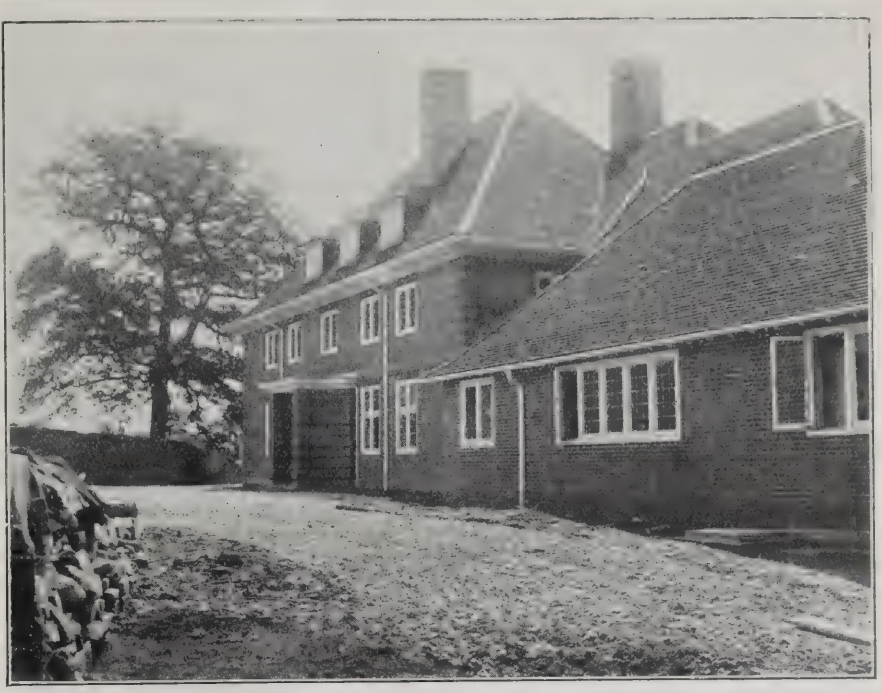
AUCHTERDERRAN.—A new church and hall are now being erected here. The church is to seat 450 persons, and the hall, which, owing to the sloping character of the site, is to occupy a position under the church, will accommodate 80 persons.

BORDESLEY GREEN, BIRMINGHAM. —The cost of a new police station, which was recently opened here, has been about £10,000. The building was designed by the City Building Surveyor, Mr. A. W. Lee, and was erected by Messrs. Thomas Elvins and Son, Soho Hill, Handsworth.

BRADFORD.—The Corporation baths and wash-house, now nearly completed, comprise three swimming baths—a first and a second class for males, and a separate one for females. The estimated cost is £39,715.

BRIGHOUSE.—The foundation stones of a new secondary school for girls has been laid. The school, which has been designed by Messrs. Sutcliffe and Sutcliffe, of Hebden Bridge, and which is a three-storey building, will provide accommodation for about 150 day scholars and 400 students in the technical evening classes, and is to cost £10,000.

CAMBUSBARRON, NEAR STIRLING.—A new United Free church, the memorial stone of which was laid recently, will cost £1,600. Mr. Ronald Walker is the architect.

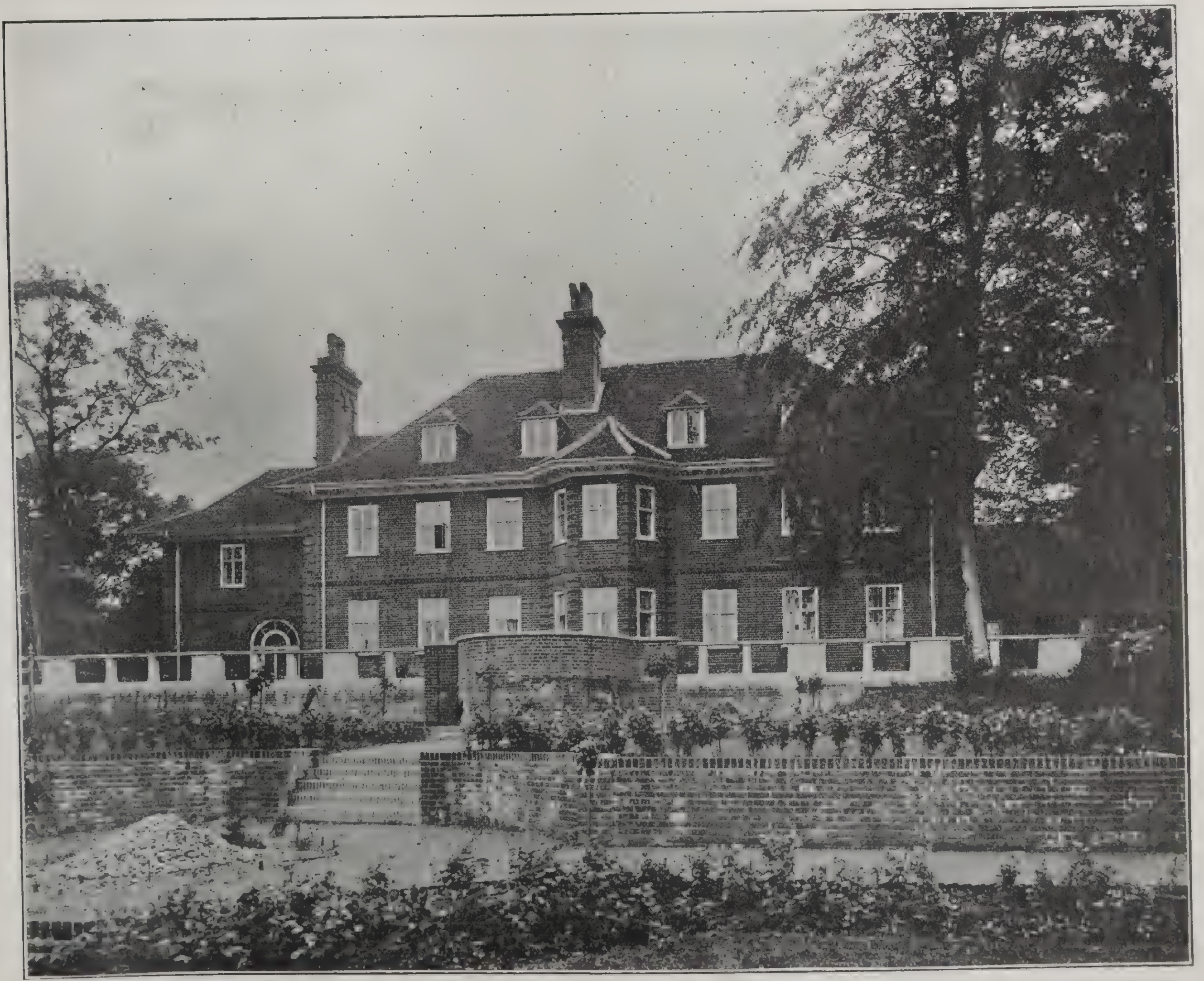


MR. MERVYN MACARTNEY'S NEW HOME, WOOLHAMPTON, BERKSHIRE. ENTRANCE FRONT.

This house is built of two-inch local red bricks, with Bath-stone dressings, and old tiles have been used for facing walls and roofing. The casements on this front have deal frames.

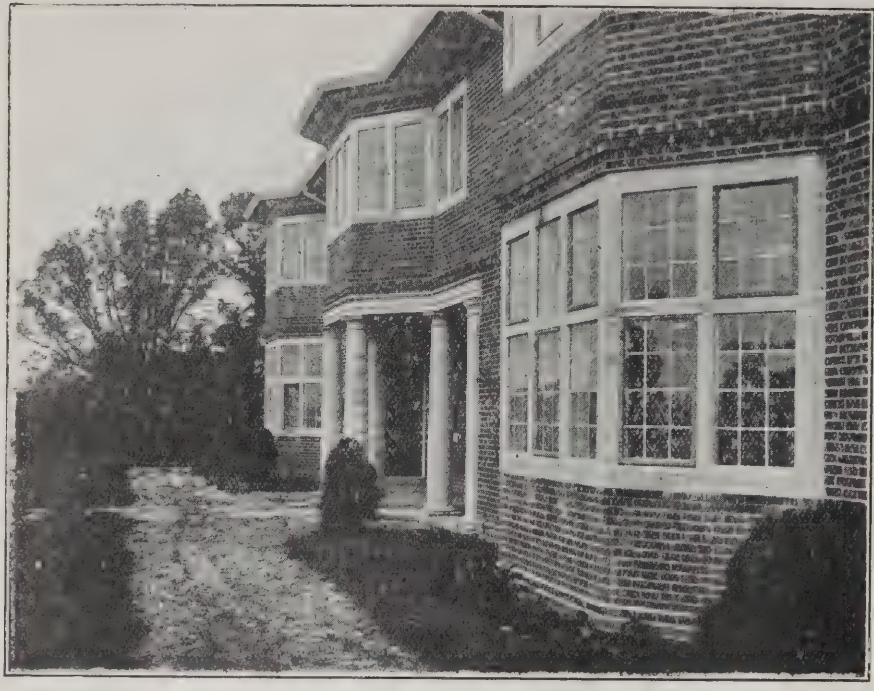
CONONLEY, NEAR SKIPTON. — The new institute now in course of erection is estimated to cost about £550. Messrs. R. B. Broster and Sons, of Keighley, are the architects.

DUDLEY.—The site of a new high school for girls has been purchased from the Earl who takes his title from this town, at a cost of £4,280. The total outlay, including the furnishing, is estimated at £23,000. The



FRITHWOOD HOUSE, NORTHWOOD. GARDEN FRONT. MERVYN E. MACARTNEY, F.R.I.B.A., F.S.A., ARCHITECT.

Mr. Macartney is one of the pioneers in the modern architectural planning of gardens. The garden of this house is a very good example of his work. It is laid out on a sloping piece of ground, two brick terraces with pleasantly arranged steps are placed in front of the house, and in the axial line is a wonderful bower of roses trained in a quite Oriental fashion, with flower gardens all round and a fish-pond at the side.



MR. MERVYN MACARTNEY'S NEW HOME, WOOLHAMPTON, BERKSHIRE. GARDEN FRONT.
This view shows the garden front with its loggia. The house being barely completed, and the garden only just laid out, the view is at present somewhat bare. The windows on this front have stone frames and iron casements.

school, which will accommodate 350 pupils, has been designed by Mr. J. Hutchings, architect to the Staffordshire Education Committee.

EDINBURGH.—The Dean of Guild Court have granted a warrant for the execution of various alterations to the Cathedral Church of St. Giles. Mr. R. S. Lorimer is the architect for the alterations, which include the construction of floors in reinforced concrete.

FINGHALL.—A new Wesleyan chapel to accommodate 100 people has been built here at a cost of £510. Mr. J. Dougill, of Aysgarth, is the architect.

GAINSBOROUGH.—A new scheme of Primitive Methodist church building, which will cost about £4,000, is now in hand. The church, now being erected, is in a plain Gothic style, designed by Mr. H. Harper, of Nottingham.

HANWELL.—The foundation stone of the new Church of St. Mellitus, which has been designed by Sir Arthur Blomfield and Sons, was laid recently by the Bishop of Kensington.

KEMBERTON.—The new tower, which has been added to the parish church, has cost £2,100. Among the interesting relics of the church is a Sarum chalice, dating back to 1520.

LONDON (BATTERSEA).—Accommodation for 20,000 volumes is given in the new library which is being erected at the south-west corner of the Polytechnic. Mr. F. Dare Clapham, F.R.I.B.A., the architect, has kept the design generally on the lines of the existing buildings. The cost will be about £6,000.

LONDON (CHELSEA).—The re-erection of Crosby Hall is to be immediately proceeded with. The four cottages in Danvers Street are to be demolished, and preparations made for rebuilding the old City hall. This has been made possible by the anonymous donor who contributed £5,000 towards the cost of re-erecting the hall, and promised a further £5,000 towards the general scheme of More House directly Crosby Hall was on the site. The donor has waived the latter condition, and is to provide the £10,000 immediately. Negotiations between the Council and the promoters of the scheme have resulted in an arrangement that the hall shall be open to visitors every morning and afternoon, the Council reserving the right to adjust the hours from time to time as may be found necessary.

MARCH.—The new County Council buildings opened here recently have been erected in the Georgian style. In addition to the various suites of offices, there is a roomy Council chamber, which seats 56 Councillors. A gallery across the end of the chamber provides accommodation for 100 persons. Mr. Herbert J. Green, A.R.I.B.A., of Norwich and King's Lynn, is the architect, and Mr. Reuben Shanks, of Chatteris, the builder whose tender of £4,295 was accepted.

MELROSE.—Building operations upon the new parish church which has been designed by Mr. J. M. Dick-Peddie, of Edinburgh, are now proceeding. The church, which, with hall and offices, is estimated to cost £9,000, is to replace the one destroyed by fire in June, 1908. The spire, originally built in 1810, is being utilised in the new design.

SHANKLIN, I.W.—The Grand Pavilion which has been erected on the pier at a cost of £4,000 provides seating for 700 people. The architect was Mr. Lewis Colenutt, and the builders were Messrs. Thorne and Co., of Westminster, who originally built the pier some 20 years ago.

WINNIPEG.—We learn that a new warehouse building is to be erected here at a cost of $75,000 (£15,411). The structure will be a seven-storey block on a site 100ft. by 50ft., and will, in all probability, be built in concrete.

Correspondence.

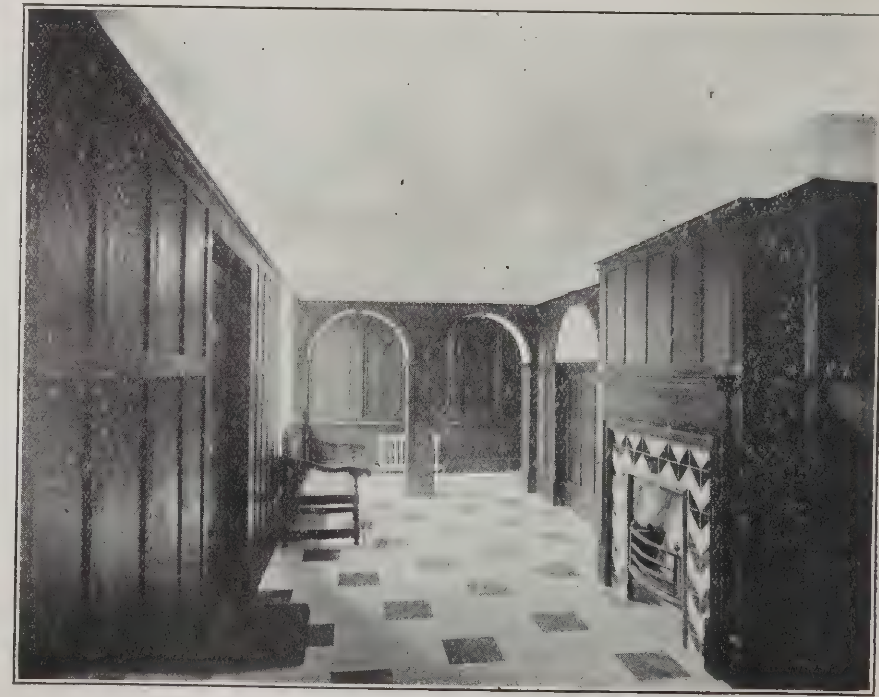
Steelwork Design.

To the Editor of THE BUILDERS' JOURNAL.

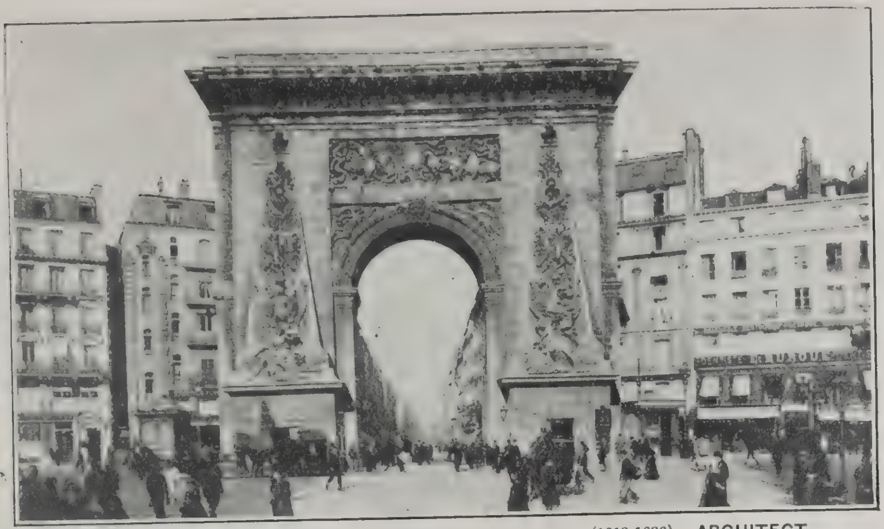
SIR,—I enclose a note on the answer to "Edinburgh" in a recent issue of "The Builders' Journal" [see Enquiries Answered.]

Having had to design some hundreds of bridges, and probably some thousands of girders, I have been frequently struck with the wide difference between the methods of girder design as explained in nearly all text books and the methods practiced by railway companies and large engineering manufacturing firms. Speaking from memory, I believe that Tarn's old method of dome calculation owes its simplicity to its neglect of hoop stresses; and any method which does that fails to explain the apparently marvellous stability of the old Spanish and modern American thin shelled domes. At the structural mechanics class at the Central School of Arts and Crafts (Architectural School), I endeavour to prove all these abstruse points by practical experiments and so far as we have gone the accuracy of Mr. Dunn's deductions have been completely borne out. The description of the design of Westminster Cathedral by Mr. Marshall in the A.A. Journal, May, 1907, contains frequent references to the difficulties caused by the weight of the domes, and the extent to which Mr. Bentley's original ideas were modified thereby. These domes which are of great (and to my mind quite unnecessary) thickness were apparently designed as simple arches by Tarn's method, the enormous additional stability afforded by the hoop stresses being neglected.

Yours faithfully,
PERCY J. WALDRAM.



MR. MERVYN MACARTNEY'S NEW HOME, WOOLHAMPTON, BERKSHIRE. THE HALL.
The walls are lined with oak, taken from his cottage at Silchester Common, eked out with some old Dutch panels, remaining from a stock that was partly used in the billiard-room at Frithwood House, Northwood, which house is illustrated on pages 114 and 115. The floor is paved with squares of Irish green and bastard statuary marbles. The staircase, formerly at 28, Margaret Street, London, is illustrated in the "Architectural Review" for August.



PORTE ST. DENIS, PARIS. FRANCOIS BLONDEL (1618-1686), ARCHITECT.

This triumphal archway was erected by Louis XIV. in commemoration of his campaigns in Flanders and the French Comté. It is over 80 feet high. The sculpture was designed by Girandon and executed by Michael Auguier and his brother.

PORTE ST. DENIS, PARIS.

This triumphal archway, raised in celebration of the successful campaigns conducted by Louis XIV. in Flanders and the French Comté, is remarkable both for the simplicity of its architectural treatment and for the elaboration of the decorative sculpture with which it is enriched. It is interesting to note that the architect of this fine monumental work, Francois Blondel (1618-1686), like Pierre Lescot, the first architect of the Louvre, and Claude Perrault, the author of a much admired addition to that great building, devoted his youth neither to the study of the arts nor to the practice of architecture.

Blondel indeed had acquired a considerable reputation as a scholar and mathematician, when he was appointed, in 1652, tutor to the son of Henri Auguste de Loménie, in whose company the future architect travelled in Germany and Italy, for the ensuing three years, during which many places of architectural interest were visited and studied. On his return to France, Blondel appears to have been entrusted by the King (Louis XIV.) with the conduct of certain political negotiations which not only necessitated his attendance at the courts of various contemporary European sovereigns, but involved on occasions visits to Constantinople and Egypt. Later, as a reward for the general success of his diplomatic missions, Blondel was appointed teacher of mathematics to the Dauphin, and was honoured by being elected to a professorship at the Royal College in Paris. There is no reason to doubt that the unique opportunities afforded by his travels enabled the future architect to carefully examine and study the most celebrated buildings of antiquity, and the architectural knowledge he thus obtained had a marked influence on his subsequent career.

But although Blondel thus grew more and more deeply interested and engrossed in the study of architecture yet, for some considerable time, there appeared to be but little prospect of his finding employment in the active exercise of that art. However, his opportunity came at last, when, in 1665, at the mature age of forty-seven, he received the King's commands to rebuild the massive stone bridge which crossed the river Charente in the town of Saintes. This bridge having been reconstructed in a thoroughly satisfactory manner, the King showed his appreciation of the services rendered by his architect by decreeing, through the issue of letters-patent, that for the future all public buildings about to be erected in Paris were to be arranged in strict conformity with a general plan prepared by Francois Blondel.

We next hear of Blondel in connection with the gateway, built by Henry II., at the end of the Rue Saint Antoin in Paris, which in 1672, was apparently badly in need of enlargement and restoration. Under Blondel's directions two additional arcades and an attic storey were added to the old structure, but the gateway thus enlarged was demolished about a hundred years later.

By a singular fatality another monument of the same kind, also erected in Paris by Blondel, and known as the Porte Saint Bernard, experienced a similar fate, as it was destroyed in 1792 on the ground that it obstructed the growing traffic of the streets.

However, there can be little doubt that the experience gained by the architect in reconstructing these two gateways was of great service to him when he was called upon, at a later period, to erect the greatest structure of its kind that had ever been up to that time produced by modern architects, or, perhaps, even by those of ancient times, for it is doubtful whether, of all the triumphal arches erected in honour of the Roman Emperors, there was one which was raised so high as the gateway of St. Denis, Paris.

Situated between the Rue du Faubourg, St. Denis on the left, and the Rue St. Denis, one of the oldest streets of Paris, on the right, Porte St. Denis comprises a large single archway which forms the central feature of a square structure over eighty feet in height. Its two facades differ only in regard to the amount of decorative work with which they are respectively embellished, that facing the Rue du Faubourg being treated in a somewhat less ornate manner.

The faces of the huge piers which form the abutments of the archway are relieved by obelisks placed upon square shaped pedestals and surmounted by globes.

The fronts of the obelisks are covered with trophies, designed in the antique manner and extending the whole height of the obelisks. Beneath each trophy, of the front or south facade, is a colossal seated figure in full relief, that on the left representing Holland vanquished, and that on the right the river god of the Rhine. On the north facade two lions take the place of the figures. The pedestals are pierced with small openings for pedestrians, round which are low reliefs of ancient arms of warfare. Above the central archway there are sculptured representations (in bas relief) of the passage of the Rhine by Louis XIV. in 1672, and of the capture of Maastricht (1673) and on the frieze the words *Ludovico Magno.* The whole of the sculpture was designed by Girandon, and executed by Michael Anguier and his brother.

The author of this fine effort of design, who was no mean authority on monumental and stately buildings, regarded his Porte St. Denis as one of the greatest constructions of its kind in the world, and he states that he "endeavoured to make its appearance even more considerable by means of an extreme justness of proportions in its ensemble, and between its parts, rather than by the quantity of ornaments with which it could be covered."

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Aug. 30	FOREST HALL, Elementary school for 250 scholars. County of Northumberland Education Committee invite designs from architects practising in the County and in the City and County of Newcastle-on-Tyne. Particulars, conditions and plan of site from C. Williams, Secretary to the Education Committeé, The Moot-hall, Newcastle-on-Tyne.
Aug. 31	HUDDERSFIELD NEW CHURCH. Plans are invited for a church to seat 400, to cost about £2,000, not to exceed £2,500, with all fittings, furnishings, lighting and heating apparatus. Plans to be forwarded to the Rev. D. Macræ Tod, B.D., St. James' Manse, Huddersfield, by Aug. 31.
Sept. 1	BRANCH LIBRARY, NEW CROSS, for Deptford Borough Council. Limited to Architects practising in the City or the County of London. Assessor: J. S. Gibson, Vice Pres. R.I.B.A. Premiums, £52 10s., £26 5s., and £10 10s., for three selected designs, and will be awarded in accordance with the conditions contained in the instructions to competitors. Site plan and copy of instruction from Vivian Orchard, Town Hall, New Cross Road, S.E. Deposit £1 1s., refunded on receipt of *bona fide* design or if instructions are returned within 21 days.
Oct. 1.	ABERDARE HOSPITAL. The Aberdare Urban District Council invite competitive designs for a fever hospital for 52 patients, including administrative block, outbuildings, etc. Premiums of £100, £50, and £25 for the designs placed first, second, and third respectively. An Architectural Assessor will be appointed on the nomination of the President of the Royal Institute of British Architects: also a Medical Assessor to act jointly. Particulars and conditions of the competition, together with a plan of the site, may be obtained from T. Phillips, clerk, Town Hall, Aberdare, on deposit of £3 3s.
Oct. 11.	HULL TRAINING COLLEGE for teachers in Elementary schools. The Education Committee invites Architects to submit designs. Premiums of £150, £100, and £50 to authors of the designs placed 1st, 2nd and 3rd respectively. Particulars and plan of site may be obtained of J. T. Riley, Secretary of Education, Albion St., Hull. Deposit, One Guinea, returnable on receipt of *bona fide* design, or the return of particulars within 14 days.

Obituary.

Mr. William Owen, A.R.I.B.A.

We regret to announce the death of Mr. William Owen, of Duchy Chambers, Clarence Street, Manchester, which took place at Surbiton on August 6th. Mr. Owen, who was a son-in-law of Sir Charles Scotter, went the previous week to pay him a visit at his residence, Rutland House, Surbiton, Surrey, where he was taken ill. Mr. Owen, who was born in Altrincham in 1852, studied at the Manchester School of Art, and in 1874 was awarded a gold medal by South Kensington for the best architectural design of the year. He was afterwards elected an associate of the Royal Institute of British Architects, and has since carried on an important practice in Manchester and district. He was one of the first members of the Hale Urban District Council, and in 1903 was appointed to the chair. He was until the time of his death a member of the council.

* * *

The death took place suddenly on July 23 of Mr. James Thompson, head of the firm of Thompson and Brierley, builders and contractors, Bury. Deceased, who was 74 years of age, was apparently in his usual health. Amongst big contracts carried out by the firm have been the Bury Art Gallery and Library, Bury Markets, council schools at Failsworth and Heywood, churches at Walmerslay and Hawkshaw, and banks at Bury and Rochdale.

LISCARD PUBLIC LIBRARY.

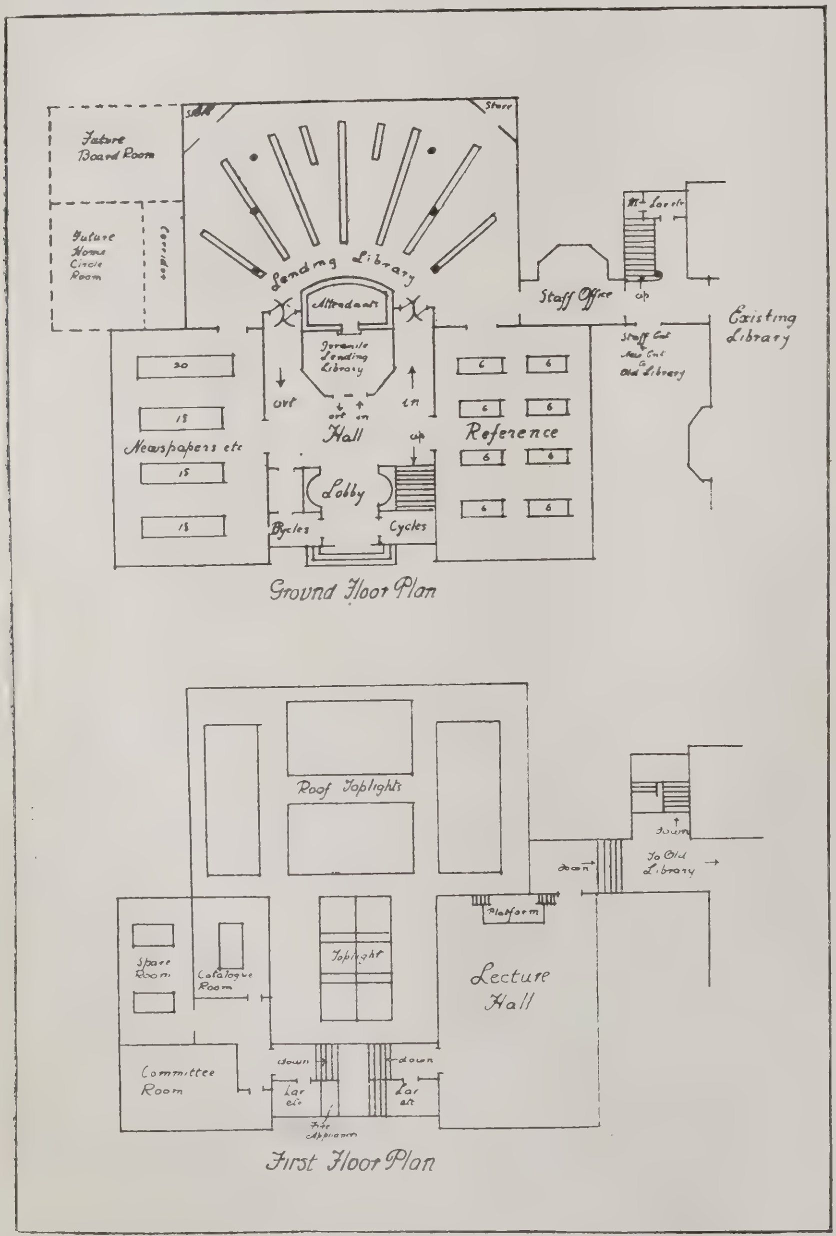
Competitive designs were invited from architects practising in the counties of Lancashire and Cheshire, premiums of fifty, thirty, and twenty pounds being offered for those designs placed respectively first, second and third by the assessor. With regard to the latter arrangement, Mr. G. H. Willoughby, F.R.I.B.A., of Manchester, who acted in the capacity of assessor, advised the Library Committee to reconsider their proposal and award to the five competitors, whom Mr. Willoughby bracketed second, premiums of twenty pounds each. The conditions of the competition, for which we believe the Library Committee to be responsible, appear to us to be somewhat unnecessarily loaded with explanatory detail, though doubtless it is better to err on this side than on that of insufficiency. At the same time we do not regard it as altogether desirable to have gone so far as to have provided a possible solution of the whole problem in the shape of a suggested sketch-plan, even though this diagram was "not given with a view to literal reproduction, but as a convenient method of indicating the provision required, and as showing the desired inter-relation of the main rooms." The greater number of the competitors, having once seen this arrangement so thoughtfully provided, appear to have been obsessed with the recollection of it, and quite unable in consequence to attempt even the smallest variation in detail. On the ground floor the accommodation required included an adult lending library, a juvenile lending library, a central hall and entrance lobby (with provision for porter and bicycles), a newspaper room, a reference library, and staff and lavatory accommodation. On the first floor a catalogue room, a committee room, a spare room, lavatories and a lecture hall were to be provided. The whole arrangement of rooms was to be connected by means of a short length of two-storied corridors to the existing library, and provision made for future extension on the site if necessary. The total cost of the new block was to be limited to £7,000, this being held to include drainage, heating, ventilation, lighting, lift, etc., but not movable furniture and fittings, or architect's fees, etc. It was requested that each set of plans submitted should comprise the following:—A block plan to a scale of 20ft. to one inch, showing proposed drains, road, paths, and entrances; a plan of each floor to scale of 8ft. to one inch, showing internal fittings, such as bookcases, counters, etc.; cross longitudinal sections to same scale as plans; Imperial size perspectives in sepia or Indian ink were admitted, but all elevations were to be devoid of colour or shadows. No alternative scheme was admitted. The first premiated design, that of Messrs. R. B. Macoll and C. E. Tonge, of Southport, adopts the arrangement suggested by the Library Committee in its main features. The proportions of the reference library and the newspaper room are somewhat improved. With regard to the lending library, in consideration of the disposition of the stacks, it is perhaps questionable whether its rectangular shape is altogether satisfactory. In our opinion the most desirable shape in this case is undoubtedly the semi-circular, though the treatment of its external junction with the main block requires very careful solution. In this plan, as in all the premiated schemes, the open access system of distribution is adopted in a satisfactory manner, though we cannot but regret the cutting-up of the entrance hall by the rather unpleasantly polygonal juvenile lending library. On the first floor the planning of the administration block appears likely to work admirably. Perhaps the shape of the committee room would bear a little revision. With the elevations we must confess we do not find ourselves entirely in sympathy, though Mr. Willoughby, in his report, has pronounced their fenestration to be good.

The design of Messrs. Sproat and Warwick, 25, Lord Street, Liverpool, embodies, we think, most of the best points of those designs bracketed second, and others which have adopted the semi-circular treatment for the lending library, and for that reason we have selected it for reproduction. The incorporation of the children's lending library in the main library, although resulting in a somewhat cramped arrangement, leaves the main hall unencumbered, and incidentally gives more direct access to the lending library than is obtained in most of the designs submitted. The double staircase on either side of the main entrance, considered in its relation to the latter, is perhaps a trifle abrupt, and might conceivably result in congestion at that point on occasion. We cannot but commend, however, the ingenious forethought displayed in the provision of an additional bookstore, balancing the staff office on the opposite side of the lending library, and in the admission of light to the newspaper and reference rooms over those portions of the latter which would otherwise be deficient, by means of top lights, without detriment to the elevations. The working arrangement of the first floor, moreover, seems to us to give evidence of expert ability in this direction. The elevations are powerfully drawn.

Mr. J. R. Earnshaw, 4, Chapel Walk, Manchester, has also adopted the circular lending library in a manner suggestive of further possibilities, whilst Messrs. Deacon and Horsburgh, 12, St. George's Crescent, Liverpool, also offer several good points.

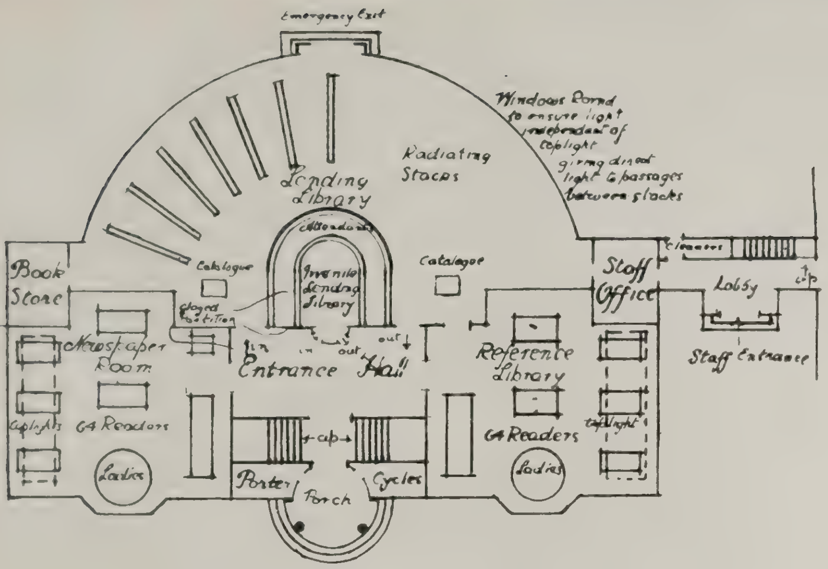
Messrs. Appleyard and Quiggin, with Mr. Beveridge, of Liverpool, present a solution which departs in a refreshing manner from the main lines of the suggested plan, in that the axes of the newspaper and reference rooms are at 45 degrees to the axis of the main lending library. Though this original method of handling the problem results in a thoroughly workable plan, we think it would be found to be somewhat expensive, and likely to offer insurmountable difficulties to successful elevational grouping. Quite extraordinary enthusiasm seems to have prompted Messrs. Packer, Drewitt and Drewitt to prepare interior perspectives of their scheme, which, though in many respects admirable, would seem also to be rather extravagant in others.

A carefully and neatly drawn set is submitted by Mr. D. Remmington, 41, North John Street, Liverpool. Also we note that Messrs. Newell and Dawson, of Liverpool, are responsible for a scheme in which the elevations are on the whole pleasantly and soberly designed in the early Georgian manner.

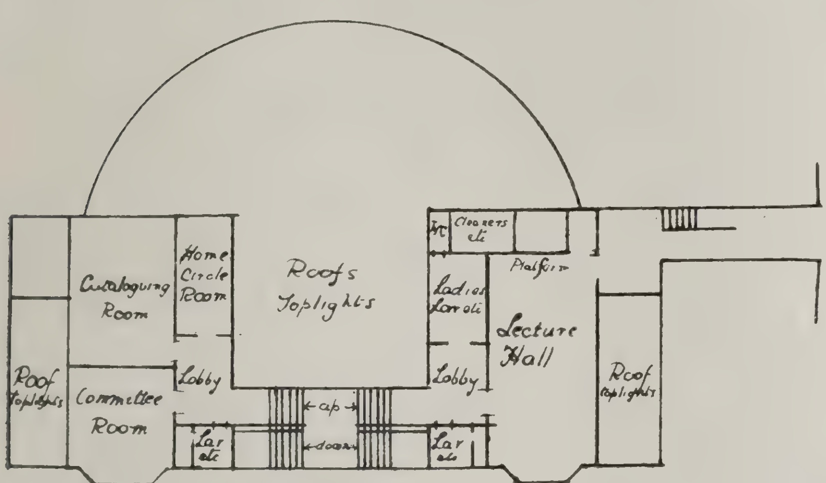


THE LISCARD LIBRARY COMPETITION. ROUGH SKETCH PLANS OF FIRST PREMIATED DESIGN. R. B. MACOLL AND C. E. TONGE, ARCHITECTS.

This design shows the adoption of the arrangement suggested by the Library Committee. In this plan, as in all the premiated schemes, the open access system of distribution is adopted in a satisfactory manner, though we cannot but regret the cutting-up of the entrance hall by the rather unpleasantly polygonal juvenile lending library. On the first floor the planning of the administration block appears likely to work admirably. Perhaps the shape of the committee room would bear a little revision.



Ground Floor Plan



First Floor Plan

THE LISCARD LIBRARY COMPETITION. ROUGH SKETCH PLANS OF DESIGN BY SPROAT AND WARWICK, BRACKETED WITH FOUR OTHER DESIGNS FOR SECOND PLACE.

This design embodies, we think, most of the best points of those designs bracketed second, and others which have adopted the semi-circular treatment for the lending library, and for that reason we have selected it for reproduction. The incorporation of the children's lending library in the main library, although resulting in a somewhat cramped arrangement, leaves the main hall unencumbered, and incidentally gives more direct access to the lending library than is obtained in most of the designs submitted.

BIRMINGHAM MUNICIPAL SCHOOL OF ART.

New Architectural Day School.

A Day School of Architecture has been founded at the Municipal School of Art, Birmingham. The object of the school is to provide architectural students in the Midlands with a thorough training in all the branches of their profession, and to prepare them for the examinations of the Royal Institute of British Architects. The course will be spread over four or five years. It is intended that the first two years shall be spent at day classes, and that they shall take the place of the first two years of articled pupilage. The latter two or three years will be spent at evening classes, and will run concurrently with articled pupilage. The fee for the day school will be 40 guineas per session, and that for the evening school 10 guineas. The committee have received an undertaking from a large number of prominent architects in the Midlands promising to forego the whole or a portion of the fee ordinarily received by them in the case of pupils who shall have attended the proposed school. The syllabus will be as follows: First year: Lectures on architectural history, building construction, elementary physics, and geometry; demonstrations and practical work in stone-masonry, carpentry, and bricklaying; simple planning, elementary design (doors, roofs, windows, etc.); perspective, drawing and lettering. Second year: Studies in ancient architecture, including measuring; practical work; lectures on the historic styles and on iron and steel construction, physics, etc., design. Third and fourth years: Mainly design and advanced physics and kindred subjects. It is hoped that third and fourth year students will be able to take some of their science subjects and carry out tests as to the strength of materials, etc., at the Birmingham University. The machinery and equipment possessed by the University for this purpose is quite unique. It is anticipated that students who follow the full course will be exempted from the intermediate examination of the R.I.B.A. A competent staff has been secured, and the first session will commence on September 13th.

The Belgian builders, now on a visit to this country, are to be entertained to dinner to-morrow, Thursday, August 12th, by the London Master Builders' Association. The dinner will take place at the St. Ermin's Hotel, Westminster, at 7 p.m.

Federation News.

LEIGH AND DISTRICT ASSOCIATION.

Secretary: S. Wigham.

On November 1st, 1908, six months' notice was given to the Operative Bricklayers of the following rule: "That on all jobs outside the Leigh Borough boundary an employer may engage the men on the job, providing such job is within the walking time radius of that particular town where the job is situated." After the six months' notice had expired the Operatives referred the rule to the Local Conciliation Board, where it was discussed at several meetings. The Operatives urged that the Leigh Master Bricklayers would, if this rule was adopted, give preference to the workmen in the town where the jobs were situated in preference to themselves. The Leigh Masters, however, pointed out to the Operatives that they were handicapped with jobs in Atherton and Tyldesley, which are just outside the three-mile radius from Leigh. Formerly, when the Leigh Master Bricklayers were doing a job in Atherton or Tyldesley and engaged men living in these places, these men would work under the walking-time rule belonging to the Leigh operatives, that is, they would begin work at 6.45 when the Leigh bricklayers arrived and booked their time from six o'clock. After several heated discussions on the subject, the operatives at length agreed to accept the rule if the masters would assist them in persuading their workmen to join the Trade Union if they had not already done so. This the masters agreed to on condition that the Trade Union bricklayers would try to preprevent the operatives from working for non-master bricklayers or doing jobs on their own at less than the day-work charges agreed to by the masters.

SOUTHAMPTON AND DISTRICT ASSOCIATION.

Hon. Secretary: A. T. Doggrell.
Asst. Secretary: S. J. Moore.

The long-standing disputes between the Southampton Master Builders' Association and the local operatives have for the present been settled by the award just issued by Mr. A. A. Hudson, the arbitrator appointed by the Board of Trade. The arbitrator sat for two days hearing evidence on both sides as to proposed alterations of wages and rules. The operatives' demands were an increase of 1s. per hour to all mechanics and various alterations of rules, these demands being met by the employers with counter notices of a reduction of ½d. per hour on all mechanics' wages and sundry alterations of rules. The net result of the award was as follows:—

Wages.—The wages of mechanics in all trades to remain as at present—no increase or decrease.

Working Hours.—A full week to consist of 53 hours full time in place of 56½ as before, the alterations being 6 a.m. to 5 p.m. on each day in the week except Saturday in place of 6 a.m. to 5.30 p.m. and 6 a.m. to 12 p.m. on Saturdays in place of 6 a.m. to 1 p.m.

Overtime.—Worked at employers request (not otherwise), to be paid at rate of time and a quarter from 5 p.m. to 7.30 p.m., time and a half from 7.30 p.m. to starting time next morning, under the old rules time and a quarter was paid to 7.30 p.m., time and a half 7.30 p.m. to 9.30 p.m., and double time from 9.30 p.m. to starting time next morning. All Bank Holidays to be paid time and a half (Good Fridays excepted). Double time to be paid on Saturdays after 7.30 p.m. and Sundays. Christmas Days to be paid for same as Sundays.

Generally.—Sundry other minor alterations were made, and an arbitration clause inserted as follows: "In case of any dispute arising between the employers and employed or between an individual employer and employee or employees, the secretary of the Employers' or Employees' Society or Association may give to the secretary of the other Society or Association a notice in writing of such dispute and thereupon 3 representatives of the employers shall meet 3 representatives of the employees to endeavour to settle such dispute, but failing settlement of such dispute within ten days of the date of the said notice the secretary of either Society or Association may apply to the Board of Trade to appoint an arbitrator whose decision shall be final and binding on both parties to the said dispute."

Societies and Institutions.

The Builders' Benevolent Institution.

The 62nd annual general meeting of the Builders' Benevolent Institution was held at 31 and 32, Bedford Street, Strand, W.C., on Monday, July 26th. The minutes of the last annual meeting were read and approved; the appended annual report, the audited accounts, and the amended rules were read and approved. The following elections were made:—President, Mr. Howell J. Williams, J.P., L.C.C.; treasurer, Mr. J. Howard Colls; committee, re-elected: Mr. C. Ansell, Mr. W. Brass, Mr. T. Hall, Mr. B. Hannen, Mr. H. Arthur Bartlett, Mr. H. Holloway, J.P., Mr. J. Randall, Mr. W. Shepherd, Mr. T. Stirling; elected: Mr. J. W. Lorden, Mr. F. G. Rice, Mr. J. C. Nicholson. Votes of thanks were given to Mr. J. W. Lorden for his kind and valuable services as president during the past year, also to the hon. auditors (Mr. J. T. Bolding and Mr. R. J. Ward, F.C.A.), the trustees, vice-presidents, committee, and dinner stewards.

The committee, in submitting their sixty-second annual report, deeply regret that in consequence of the continued depression in the building and allied trades the funds at their disposal have decreased to such an extent that they have been obliged to sell out £500 of stock to meet liabilities in the past year. The committee earnestly appeal for assistance in order to make provision for the many claims upon this charity. They desire to register their hearty vote of thanks to Mrs. Richardson for her kind gift of £857 in memory of her deceased husband. The money has been invested in the purchase of London and South-Western Railway Company Stock, and the proceeds will be devoted to paying a female pensioner, approved by the committee and nominated by Mrs. Richardson. Attention is directed to the fact that the greatest economy is exercised in keeping down the administrative expenses. During the year three (3) additions have been made to the pensioners' list, which now consists of 29 men and 27 women. Five (5) male and five (5) female pensioners have died during the last twelve months; the widows of the deceased male pensioners have been placed on the list after careful investigation of their claims. The committee desire to thank Mr. J. W. Lorden for his valuable services and kind contribution as president. Also the trustees (Mr. F. J. Dove, Sir Arthur C. Lucas, Bart., Mr. T. F. Rider, Mr. J. Howard Colls, Mr. T. Stirling, and Mr. J. T. Bolding), the honorary auditors (Mr. J. T. Bolding and Mr. R. J. Ward, F.C.A.), and the dinner stewards. Mr. Howell J. Williams, J.P., L.C.C., has kindly accepted the presidency for the coming year. The annual dinner will be held on Thursday, November 25th, 1909.

The National Association of Master House Painters & Decorators of England & Wales

The Sixteenth Annual Convention of this Association will be held at Sheffield from September 13th to September 18th, the headquarters being at the Artillery Drill Hall, Shoreham Street, Sheffield. The Convention will be opened at 7.30 on the 13th inst., when the President (Mr. James Puttrell) and Mrs. Puttrell will receive the members and friends. The following is the programme arranged for the Convention:—11: Reception of members and visitors by the President and officers in the Exhibition Hall, and Inspection of exhibits of manufactures, apprentices' competition work, and studies made in Italy by B. Hamlyn, Ivor Beaumont, and Tom Stoney, winners of the International Studentship competition. 11.30: Arrival of the Rt. Hon. the Lord Mayor of Sheffield and members of the Corporation, who will make an inspection of the Exhibition and apprentices' work. 12: The Lord Mayor will take the chair and welcome the visitors to the city. Address of welcome to the Convention and Presidential address by Jas. Puttrell, Esq. 12.30: Opening of the Exhibition by Sir Wm. Richmond, R.A., K.C.B.; votes of thanks. 2.30 (closed session): Reception of delegates from the Netherlands Association of Master House Painters, minutes of last Convention, report from the Secretary, report from the Treasurer, report from the Education Committee, report re the Travelling Scholarship Competition, report from the adjudicators of the Apprentices' Competition, report from the adjudicators of the Extension Prize Scheme Competition, votes of thanks to the adjudicators and examiners, greetings from the Association of Master Painters in Scotland (J. Carfrae, Esq., President) and Ireland (Ed. Gibson, Esq., President), trade topics to be introduced by members, report from the Paperhangings Committee, report from local Associations. All business held over will be taken at the morning session on Tuesday. Visit to the Town Hall and afternoon tea. 8: Lecture by Sir Wm. Richmond, R.A., K.B.C., on "House Decoration for the Masses." Wednesday, September 15th: Breakfast and Conference of Presidents and Secretaries of Associations, Royal Victoria Station Hotel, 7.30 to 9 a.m. Particulars to be announced later. All names of those intending to be present to be sent to the General Secretary not later than September 1st, 1909. 10 a.m.: To consider reports on the paperhangings question and the stores shops, and to take resolutions thereupon. Paper: "The Need for Reviving the Apprenticeship System." Mr. John H. Cantrill; discussion. 11 a.m.: Paper (subject announced later); discussion. 2.30 p.m.: Demonstration by Mr. W. J. Cloake (Past Master of the Company of Painter Stainers), who will illustrate the methods of working four different marble panels—siena, rouge, black and gold, and Irish green. This meeting will be open free to apprentices of master painters in Sheffield. Annual business meeting and election of officers, etc., for 1909-10; votes of thanks to retiring officers and committees. 7.15: Annual dinner, Royal Victoria Station Hotel; tickets, 5s. each. Thursday, September 16th: Excursion to Matlock, Haddon Hall, and Bakewell; tickets, 9s. 6d. each. Tickets for the excursion and dinner to be obtained from Mr. Sam Talford, 430, Abbeydale Road, Sheffield. Friday, September 17th: The Committec are hoping to arrange to give the visitors a view of some of the large and famous works at Sheffield.

Insurance.

Free £500 Accident Insurance Coupons have this week been sent to the following:

C. D. W. (Ashby-de-la-Zouch), C. H. B. (Leytonstone), J. F. C. (Manchester), W. C. (Wandsworth), A. W. S. (Exeter), H. B. (Camberley), A. E. T. (Portsmouth), R. S. (Plaistow), A. J. P. (Somerset), W. H. W. (London, N.), M. S. (Grantham), J. H. (Basingstoke), A. C. H. (Bournville), A. B. (Gt. Bookham), W. H. F. (Cheltenham), F. H. B. (Hampstead).

New Companies.

TAYLOR MANUFACTURING COMPANY, LIMITED.—Registered July 28th. Capital, £1,000, in £1 shares (500 Preference). Objects: To carry on the business of manufacturers of builders' hardware, including metal window casements and fanlight gearing, etc. Private company. The number of directors is not to be less than two nor more than three. E. C. Taylor is the first. Qualification, £100. Registered office, Shepherd Street, Wolverhampton.

HERTS ESTATES COMPANY.—Registered July 27th. £25,000 (£1) (10,000 cum. pref.). To acquire and turn to account land, buildings, or other real and personal property in the counties of Hertford, Surrey, Sussex, Middlesex, Kent, or elsewhere.

VALESCURE LAND COMPANY, LIMITED.—Registered July 28th. Capital, £15,000, in £1 shares. Objects: To adopt an agreement with Amadee B. de Guerville, and to acquire, deal with and turn to account land, buildings, and house and other proerty in the United Kingdom, France, and elsewhere. Private company. The first directors (to number not less than two nor more than five) are G. Byng and Amadee B. de Guerville. Qualification, £500. Registered office, 46, Queen Victoria Street, E.C.

Partnership Dissolved.

Charles King and Edward William Lister, carrying on business as architects and surveyors, Plymouth, in the county of Devon, under the style or firm of "King and Lister," has been dissolved by mutual consent as and from the 1st day of July, 1909. All debts due to and owing by the said late firm will be received and paid by the said Charles King.

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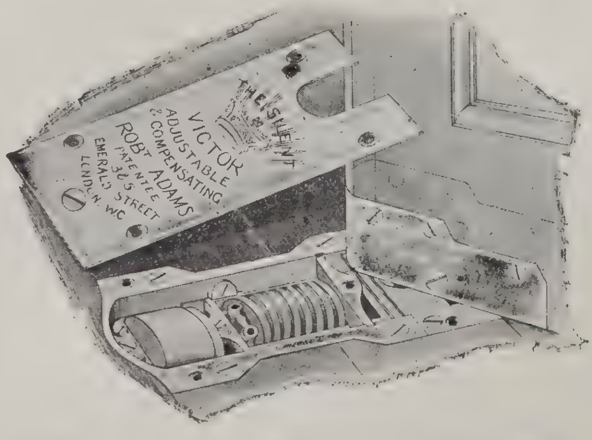

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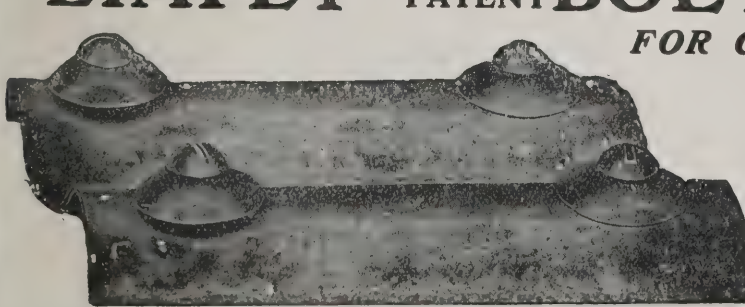

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Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Aberdare.—Provisionally accepted for the erection of new laboratories at the Aberdare Intermediate Schools, for the Glamorgan Education Committee. Mr. D. Pugh-Jones, County Architect, Cardiff.

S. Shail, Llandaff, £3,093.

Aberdare. — Accepted for erection of unclimbable iron railings round the Aberdare Intermediate School playfield, for the Glamorgan Education Committee. Mr. D. Pugh-Jones, County Architect, Cardiff.

Hill and Smith, Brierley Hill Ironworks, Staffs, £139.

Ashington, etc. (Northumberland).—Accepted for erection of a new school and additions and alterations to existing buildings as follows:—Ashington New Hirst South, new school for 340 scholars; Haltwhistle Council School, additions and alterations; South Gosforth Council School, additions and alterations for the Northumberland Education Committee.

J. and G. Green, Warkworth, £2,699 17s. 6d.

Berkeley (Glos.).—For erection of a new elementary school at Berkeley, for the Gloucestershire Education Committee. Mr. R. S. Phillips, architect, Midland Bank Chambers, Gloucester:—

Main Building.

J. Coats, Bristol	£4,874	14	4
King and Sons	3,539	0	0
E. Love, Bristol	3,340	0	0
J. H. Gurney	3,226	0	0
A. S. Cooke, Stroud	3,193	6	3
Collins and Godfrey, Tewkesbury	3,159	0	0
E. Walters and Son, Bristol ...	3,155	0	0
P. C. Cousins	3,100	0	0
W. Jones	3,100	0	0
A. J. Colborne, Swindon... ...	3,095	10	0
Orchard and Peer, Stroud ...	3,046	0	0
W. T. Nicholls	3,070	0	0
Bloodworth and Son, Dursley	3,058	0	0
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H. Dorse, Cradley Heath ...	2,950	0	0
Dimery and Sons, Berkeley ...	2,937	16	0

Birmingham.—Accepted for rebuilding Highland Tavern, Holyhead Road, Handsworth, for Holders Brewery Co., Ltd. Mr. Arthur Edwards, Bennetts Hill, Birmingham, architect.

G. Webb and Son, Birmingham, £2,013.

Birmingham.—Accepted for alterations and additions to manufactory, Charles Henry Street, Birmingham, for Mr. Henry Cox. Mr. John G. Dunn, Newhall Street, Birmingham, architect.

G. Webb and Son, Birmingham, £2,300.

Coleshill (near Birmingham). — For additional wing, containing laundry, chapel, and babies' rooms, for the Rev. G. V. Hudson. Mr. Henry T. Sandy, architect, 22, Greengate, Stafford. Quantities by architect:—

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Fochriw (Glamorgan).—Accepted for erection of an infants' Council school at Fochriw, Glam., for the Glamorgan Education Committee. Mr. D. Pugh-Jones, M.S.A., Cardiff, county architect.

F. Bond, Beda Road, Cardiff, £3,082 15s.

Herne Bay (Kent).—For erection of a cloak-room and for improved heating, at the Council school, for the Kent Education Committee. Mr. H. W. Robinson, architect:—

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(*Tenders continued on page viii.*)

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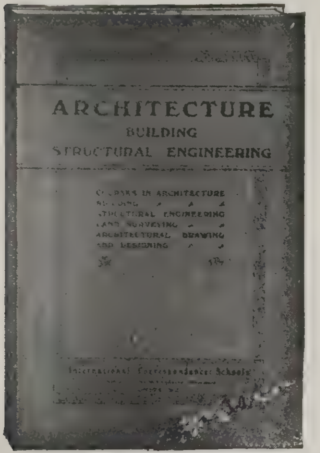

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(Tenders continued from page vi.)

Grantham.—For erection of a girls' secondary school at Grantham, for the Kesteven County Council (Education Committee). Mr. H. H. Dunn, A.R.I.B.A., architect, Silver Street, Lincoln:—

School Buildings.

Walker Bros.	£8,025	13	0
Halkes Bros., Lincoln	7,360	13	1
Parker and Son, Boston and Grimsby	7,349	0	0
Fox, Leicester	7,180	0	0
Wright and Son, Lincoln	7,148	0	0
Hedley, Lincoln	6,699	0	0
Read	6,625	0	0
Rudd and Son	6,600	0	0
Cracknell, Peterborough	6,571	0	0
Hockley and Co.	6,430	16	9
Maxey and Son, Sleaford	6,400	0	0
Faulks, Loughborough	6,310	0	0
Moss and Sons, Loughborough	6,300	0	0
Wainer, Nottingham	6,190	0	0
Corah and Son,* Loughborough	6,184	15	0
Bosworth and Lowe, Nottingham	6,138	0	0

* Accepted.

Cottage.

Fedley	£570	0	0
Walker Bros.	513	0	0
Falkes Bros.	502	5	3
Fox	439	0	0
Bracknell	434	0	0
Parker and Son	420	0	0
Hockley and Co.	414	17	5
Rudd and Son	400	0	0
Wright and Son	399	0	0
Hoss and Sons	383	0	0
Read	373	0	0
Wainer	360	0	0
Corah and Son*	356	10	0
Haxey and Son	350	0	0
Cosworth and Lowe	345	0	0
Faulks	340	0	0

*Accepted.

Levelling.

Walker Bros.	£827	0	0
Hockley and Co.	575	0	0
Maxey and Son	514	0	0
Halkes Bros.	503	2	2
Cracknell	392	0	0
Fox	380	0	0
Rudd and Son	350	0	0
Faulks	345	0	0
Wainer	310	0	0
Hedley	297	0	0
Bosworth and Lowe	296	15	0
Moss and Sons	286	0	0
Wright and Son	267	0	0
Read	£258	0	0
Corah and Son*	236	8	0
Parker and Son	220	0	0

Rest of Grantham.

*Accepted.

London.—For erection on "Millwall" site (Poplar) of a domestic economy centre and a metal work centre with science room, for the London County Council:—

H. L. Holloway, Church Street, Deptford	£4,639	0	0
G. Parker and Sons, 124, Sumner Road, Peckham	4,614	0	0
Perry and Co. (Bow), Ltd., Tredegar Works, Bow	4,597	0	0
J. Chessum and Sons, 7a, South Place	£4,445	9	7
W. Harris, Steam Joinery Works, North Woolwich	4,224	0	0
F. and T. Thorne, Isle of Dogs	4,133	0	0
T. D. Leng, Evelyn Street, Deptford	4,110	0	0
J. and C. Bowyer, Ltd., Upper Norwood	4,107	0	0
F. and E. Davey, Ltd.,* Elmer avenue, Southend-on-Sea	4,054	19	4

Architect's (Education) estimate, £4,250.

* Recommended for acceptance.

Rhos-on-Sea (Wales).—For erecting new Congregational schools and caretaker's house, for the trustees. Messrs. J. M. Porter and Elcock, architects, The Estate Office, Colwyn Bay. Quantities by the architects:—

Schools.

Davies and Collins	£1,417	12	0
T. Jones	1,390	0	0
Roberts Bros.	1,331	10	0
Jones and Pritchard	1,281	0	0
Tucker and Sons	1,311	0	0
Bond and Sons	1,285	14	7
L. Jones	1,230	0	0
O. Jones and Hughes	1,130	0	0
J. O. Davies	1,115	0	0
R. Williams,* Rhos-on-Sea	1,057	19	5

Caretaker's House.

Davies and Collins	£422	6	0
T. Jones	400	0	0
Roberts Bros.	446	5	7
Jones and Pritchard	397	0	0
Tucker and Sons	346	2	0
Bond and Sons	348	10	11
L. Jones	366	0	0
O. Jones and Hughes	390	0	0
J. O. Davies	326	0	0
R. Williams,* Rhos-on-Sea	266	10	0

Architect's estimate, £1,332 for both works.

*Accepted.

Trowbridge (Wilts).—For work to be done in internal and external renovations to the County Offices, Trowbridge, for the Wilts County Council. Mr. J. G. Powell, county surveyor:—

Pratt and Co., Bath	£353	18	7
Parnell and Sons, Ltd., Bristol	349	17	0
J. Coates, Bristol	311	3	10
W. Robbins, Woodborough	235	14	4
E. Linzey, Trowbridge	221	14	9
E. Beavan and Son, Bradford-on-Avon	218	18	3
E. Preece, Trowbridge	190	16	0
G. Moore and Sons, Trowbridge*	187	6	5

* Recommended for acceptance.

Worcester.—For St. Martin's new church, Worcester. Mr. G. H. Fellowes Prynne, F.R.I.B.A., architect, 6, Queen Anne's Gate, Westminster. Quantities by Mr. R. H. Hale, F.S.I., 6, Queen Anne's Gate, Westminster:—

	A.			B.		
Cornish and Gaymer, North Walsham	£12,023	0	0	£427	0	0
Collins and Godfrey Tewkesbury	10,880	0	0	459	0	0
J. Dallow and Sons, Birmingham	10,825	0	0	468	0	0
Foster and Dicksee, Rugby	10,675	0	0	385	0	0
W. L. Franklin, Deddington	10,384	0	0	501	0	0
Sapcote and Sons, Birmingham	10,200	0	0	390	0	0
Goddard and Sons, Dorking	10,180	0	0	1,050	0	0
J. Parnell and Sons, Rugby	10,069	18	8	279	0	0
Wood and Sons, Worcester	9,710	0	0	405	13	10
Fairhead and Sons, Enfield	9,693	0	0	456	0	0
Bowman and Sons, Stamford	9,627	0	5	578	2	0
W. Bowers and Sons, Hereford	9,609	10	5	321	15	4
J. Jarvis and Sons, Hackney	9,488	0	0	370	0	0
Wilkins and Sons, Bristol	9,426	8	6	372	13	7
Walden and Cox, Henley-on-Thames	9,083	0	3	691	10	4
J. and A. Brazier,* Bromsgrove	8,868	9	6	449	9	7

A.—Cost of church with stone outside and brick inside facings. B.—Saving if brick outside in place of stone.

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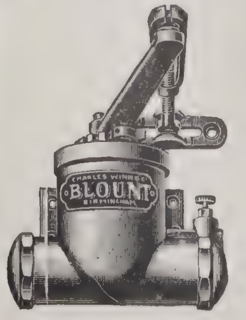

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Grimsby Town Hall Extension. That out of the 104 architects who applied for particulars of this competition, 45, or nearly half, returned the paper and had their deposits refunded, may be explained by the uncertainty of the Council and its intentions regarding the whole scheme. Since the meeting when it was decided to proceed with the competition and Sir Alfred Gelder was appointed assessor, considerable opposition has arisen within the Council against the whole proposal, and this has been manifested by blocking every trivial intermediate step in connection with the scheme. It need hardly be pointed out that the proper time for opposition was when the matter was first brought up. The decision of the Council to proceed with the competition, when determined by voting, should end opposition to the scheme, otherwise great injustice is done to the architects and the assessor, who may very probably find the whole of their work thrown away. The appointment of Sir Alfred Gelder, which was duly announced as settled, was not confirmed on reference to the full Council, because of opposition—not to the distinguished architect himself, but to the scheme which he was engaged to assess. This confirmation being merely a formal matter, such tactics seem unworthy of a body like the Grimsby Town Council, and we are not surprised that the Mayor should have appealed at the meeting of the Finance Committee for the Councillors to be honest with each other, or that he should say that their conduct in the matter was unseemly, and should request the Council to preserve its dignity and do the thing in a decent way.

White Lead. The information that the French Government has passed a law prohibiting the use of white lead will be of unusual interest to the Building Trade generally, and to the painters and decorators especially. The law enacts that after the expiration of five years, the use of white lead, or of paint composed of linseed oil and white lead, and of all special compounds containing white lead in any form shall be prohibited for every description of painting work. This drastic enactment is designed to remove the causes of plumbism, which has made terrible ravages among the workpeople in the manufactories and among painters and other workmen using white lead. The proposal for its total prohibition has been debated in the French Parliament for over five years, and has been carried in the teeth of very strenuous opposition by the manufacturers. We presume that, following the example of France, the prohibition of white lead in this and other countries will follow in due course. At the same time prohibition will not now result in such a revolution in painting and decorative work as it would some years ago. The great increase in the use of zinc oxide as the basis for paint has within recent years made considerable difference to the white lead business. The enormous amount of white enamel now used (which is invariably made from zinc oxide) for decorative work has not been without its influence in preparing us for a still wider use of zinc oxide paint. Though zinc oxide is dearer than white lead, it is much lighter, and weight for weight it spreads over a much larger surface, the expense finally being about the same. Moreover zinc oxide keeps a lasting white colour, resisting sea air and sulphur fumes. On the whole, therefore, if white lead has to go, an efficient, and, in some respects, superior article is to hand to take its place; and this fact makes the idea of prohibition far less disturbing than it otherwise would be.

Guide Books and Architecture. An architect who is spending his holidays in England, and in the enjoyment of what he describes as "a modest little tour in search of the picturesque in scenery in buildings," complains of the ineptitude of the cheap modern guide-books that have recently become so plentiful. The modern popular guide-book, he says, is superficially attractive, and, when it is not actually given away by an enterprising advertising corporation, may be bought for a few coppers; but, as a rule, while it is garrulous about the "attractions"—the bands, the sands, the bathing, the "walks and drives," and the "entertainments"—it conveys very little substantial information on things that really matter to the intelligent enquirer. In particular, there is little or nothing about architecture, and the occasional observations on this subject are usually idiotic, as when one is solemnly informed that a certain royal residence "is in the domestic style of architecture." It is a pity that the gratis or penny or twopenny guide should be everywhere superseding the old type of book, which, published at sixpence or a shilling, was often written by a local scholar—vicar, architect, or archæologist, who knew and loved every stone of every worthy building within his purview—and was a thing to be treasured. Our correspondent had, of course, provided himself with the indispensable and scholarly general guides issued by Murray, to whose publications in this kind architects are under considerable obligations; but he holds that the necessarily compressed information these contain should be supplemented or expanded in the purely local guides. That used to be the rule, but apparently is so no longer. Our correspondent adds that in his view the most dismal aspect of the case is the confidence with which the compilers of cheap, showy, up-to-date guide-books assume the public indifference to architectural interest. Frequently, in dealing with important modern public buildings, they omit to mention the name of the architect, thus following the bad precedent of the daily press. This is hardly fair to the public, of whose awakening interest in art and architecture we are being so persistently assured; and it is distinctly unjust to the architect, who might do better work if he got more recognition.

Westminster Abbey Museum. There is, it appears, a proposal to set aside a portion of Westminster Abbey as a kind of museum of relics and antiquities. The suggestion is giving rise to a great deal of opposition; one hardly sees why. The relics are already there, but are scattered and unclassified. The objection, therefore, can only apply to their assembly and classification, and perhaps to the probable charge for admission. This, it must be admitted, is suggestive of profanation, although, in reality, waiving the matter of charge, the question is merely that of distinguishing between profanation dispersed and profanation congested, and one would prefer to leave it to be determined by the casuists. Our own view of the matter is, that while we can have nothing to do with the purely pietistic aspect of the case, we are so far concerned in the Church's dictum of doing things "decently and in order" as to trust that whatever course may be adopted with respect to the Abbey relics may be taken with due consideration for the architectural dignity of the building. That object might possibly be best served by clearing out a large number of ugly and intrusive effigies, whether of bronze or stone, or wood or waxwork, which, for all the artistic or historical interest they possess, might without the least remorse be relegated to the nearest dust destructor. It it a pity that they were ever admitted to the Abbey. The custodians of a temple of religion should not be allowed to accumulate a miscellaneous collection of objects that invites comparisons with Madame Tussaud's and the average local museum. Such objects, besides introducing too many elements of mundane distraction, detract from the purity and grandeur of the temple as a building, interrupting its lines and falsifying its values. The proper course with both the Abbey and St. Paul's would be to take the advice of the architects in making a general clearance of the inappropriate objects that, against all the canons of good taste, have been admitted to the sanctuary, at any rate in point of architectural propriety, they by no means deserve. If it is the aim of the Abbey authorities to remove such objects to the obscurity of some crypt or lumber-room, architects will feel no inclination to rise up in protest. Forty or fifty years ago, when a somewhat similar proposal was carried into effect, Thomas Hood wrote a long and scathingly satirical poem against it; but, if memory serves us, the chief ground of his objection was the charge for admission. Still, if people can be got to pay for seeing the monstrosities that at present disfigure and profane the public parts of the Abbey, the only objection that we can see is that the system perpetuates the existence of a good deal of rubbish that might well be destroyed.

The City of the Future. Dr. Houriet, of Paris, has just been giving to the world his conception of the model city of the future. The first problem is that of site. It must be dry and easily drained. Then comes the task of planning, and here the first question is that of orientation. It is necessary to study the direction and character of the winds, and to so lay out the streets that a free circulation is offered to those winds which are laden with ozone, and free from carbonic acid gas and other contaminations. The main streets would all be laid out parallel to each other, with intersecting cross streets. Houses would be erected on either side of the main streets, each house "pointing both ways," that is to say, no back-to-back houses would be tolerated, nor would gardens be allowed. Moreover, the houses would have only one row of rooms, facing the main street, with a corridor at the back. Thus through ventilation would be assured. As the aim would be to flood house fronts and rooms with air and sunlight, no balconies would be permitted on the room side of the houses, but they could be placed at the back, leading out of the corridors. All roofs would be flat for the sake of safety, and to do away with attics. These roofs could be arranged as playgrounds or gardens. The main avenues would be wide, the minimum width being calculated according to aspect, so as to ensure that the whole house front, from street level to roof, should be at least once every twenty-four hours exposed to the sunrays. The footpaths would also be wide, and would be divided from the carriage ways by garden borders. These would not be tree planted, because trees obstruct sunlight and induce dampness, but shrubs would be arranged in picturesque groups, and in the chief avenues these borders would be dainty flower and shrub gardens, the shrubs interspersed with architectural pedestals supporting vases and sculptures. The side streets would be comparatively narrow, their width equal to the height of the houses; but as they would be cut up into short lengths, as they would only have the same length as the depth of a house, they would always be sufficiently ventilated. Rather more latitude would be allowed for public buildings. These might occupy the sites of two or more blocks, but would always be so arranged as to be isolated, fronting on two main avenues, and on two side streets, which in these cases would be wider than usual. Many of these buildings would be placed opposite the public gardens, which would be of about an acre in extent, and placed at frequent intervals, having due regard to picturesque effect, but so arranged that no house should be further away than a quarter of an hour's stroll from one of them. Larger public parks could be arranged, in such a way as to avoid dampness, but such large parks should not be used as substitutes for the playground gardens. It will be seen that Dr. Heuriot's model city would demand considerable space, and a more strict attention to meteorology. Unquestionably, such a town-planning policy as here set forth would present most interesting problems both to architects and builders.

Whitgift Hospital. The demolition of the Whitgift Hospital at Croydon is still advocated in the "Croydon Chronicle," in spite of the chorus of protest that has greeted the proposal. The current issue of that journal contains a very temperately and courteously-written leader, in which reference is made to the observations on the subject that appeared in our columns a fortnight ago. Our contemporary tacitly admits the truth of our contention that the Whitgift Hospital is a veritable work of art, and even goes so far as to concede that "there is much within the interior that is unique and even beautiful"; but he pleads that the building is out of harmony with its surroundings, and that it obstructs necessary improvements. Our contemporary fears that we are considering the question without due regard for the sanitary standpoint. But surely the condition of the Whitgift Hospital would not present an insoluble problem to the sanitary engineer. The Whitgift Hospital is not to be condemned upon such a charge as this. The contention that the site is required for street improvements is not without force, but we do not think that the argument is of sufficient weight to justify the destruction of this Elizabethan gem, which we are by no means alone in regarding as the most beautiful building in Croydon. Our contemporary's concluding appeal for a pure "unadulterated style—a real twentieth century design" is curious when read in the light of his eulogium on "the fine stately buildings erected close by the Whitgift Hospital." Nevertheless, he thinks that the architect of today is too greatly addicted to the copying of old models. Of course, any competent architect could reassure him on this point. Style is no mushroom growth. It is evolved, more or less slowly and tentatively, by the very process that he condemns. In this sense Brunelleschi, Inigo Jones, Wren—in fact, all the great architects—are what our contemporary would probably regard as "copyists." *Ex nihilo nihil fit.*

A new United Free Church at Whiting Bay is to be built of brick rough cast, with the sandstone facings from Barskimming. In the nave there will be seating for about 300, and in the transepts for about 150. The building will have a spire. A suitable manse will also be erected. The architects for both church and manse are Messrs. J. W. and J. Laird, 163, Hope Street, Glasgow.

London Suburbs.

III.—Dulwich and Norwood.

Dulwich and its neighbour, Norwood, are modern if not new, and each has a distinctive character. Dulwich has grown from a pretty hamlet into a large suburb of villas of many sizes and styles, placed in a valley, the favourite site for most old builders, who sought for shelter above all things. It is nevertheless a hundred feet above the level of the Thames. Its attractiveness lies very much in its green leafiness, and this is due partly to the preservation in the heart of the neighbourhood of the beautiful grounds of an old foundation—Dulwich College. Grand and stately trees surround the "College of God's Gift," founded by Edward Alleyne, actor, and "keeper of the King's bears" to James I. Seventy-two acres of the estate were given by the College estate to the London County Council, for a public park, a gift estimated at a thousand pounds an acre. The College designed by the younger Barry, rises in three great groups or blocks, mainly in red brick, connected by open cloisters; the detail is taken from northern Italy; and the whole group is well seen from the railway. Older buildings remain, and in one is the small but interesting picture gallery. The collection was originally formed for the last King of Poland. The gallery is mentioned sympathetically by Kingsley in his "Alton Locke."

Dulwich is as good an example as could be desired of a village, which grew into a suburb in the Victorian time, when the villa flourished and suburban flats were as yet unknown, handsome houses in good gardens, many trees, and pleasant roads of smaller residences. Building operations have of course spoilt not a few pretty "walks," but many remain, and the suburb is a pleasant one.

It is in strong contrast with its ambitious neighbour, Norwood. For whilst Dulwich represents the old idea, so resolutely clung to by our forefathers, of choosing a valley for their residence, Norwood exhibits the modern idea, insisted upon by sanitary reformers, of building on a hill. It stands upon the highest ground available for many miles, and commands an unrivalled view. Its origin is interesting; it was a well-known health resort long ago, owing to the proximity of the Beulah Spa, to which many people resorted to "take the waters." To this Norwood can claim possession of several good hotels, and the "villa residences" in many cases rise to mansions, whilst the gardens are large and luxuriant. It is remarkable that the steepness of the hill is not objected to by anybody, and the train service to London is frequent. But the growth of this great suburb was largely due to the creation of the Crystal Palace.

This was, perhaps, the greatest work of the Victorian era. Ruskin, indeed, declared that after all it was only "a conservatory," but it is the finest conservatory in the world, with a length of 1,608ft., immense width, and a height of 175ft., flooded with light in every part, it is a remarkable and interesting structure. The grounds with their vast terraces, the superb fountains, the remarkable newspaper room, the concerts, the lectures, and exhibitions made up a total which was unique in its day, and at one time it seemed as if "the Palace" would swallow up every form of popular entertainment. Its purpose however, was education rather than amusement. Time, and the opening of new entertainments and exhibitions in London have led to a decline in its popularity. One remarkable attempt at the education of the public on a subject of which they know far too little, was made in the architectura courts. These, commencing with ancien Egypt, led the visitor through Greece and Rome, to the Romanesque and early Gothic But the gem of the series was, or rather, is for it still exists, the beautiful reproduction on a reduced scale, of the Court of Lions, in the Alhambra of Granada, with its pendentives in violet-blue, with thin lines of gold

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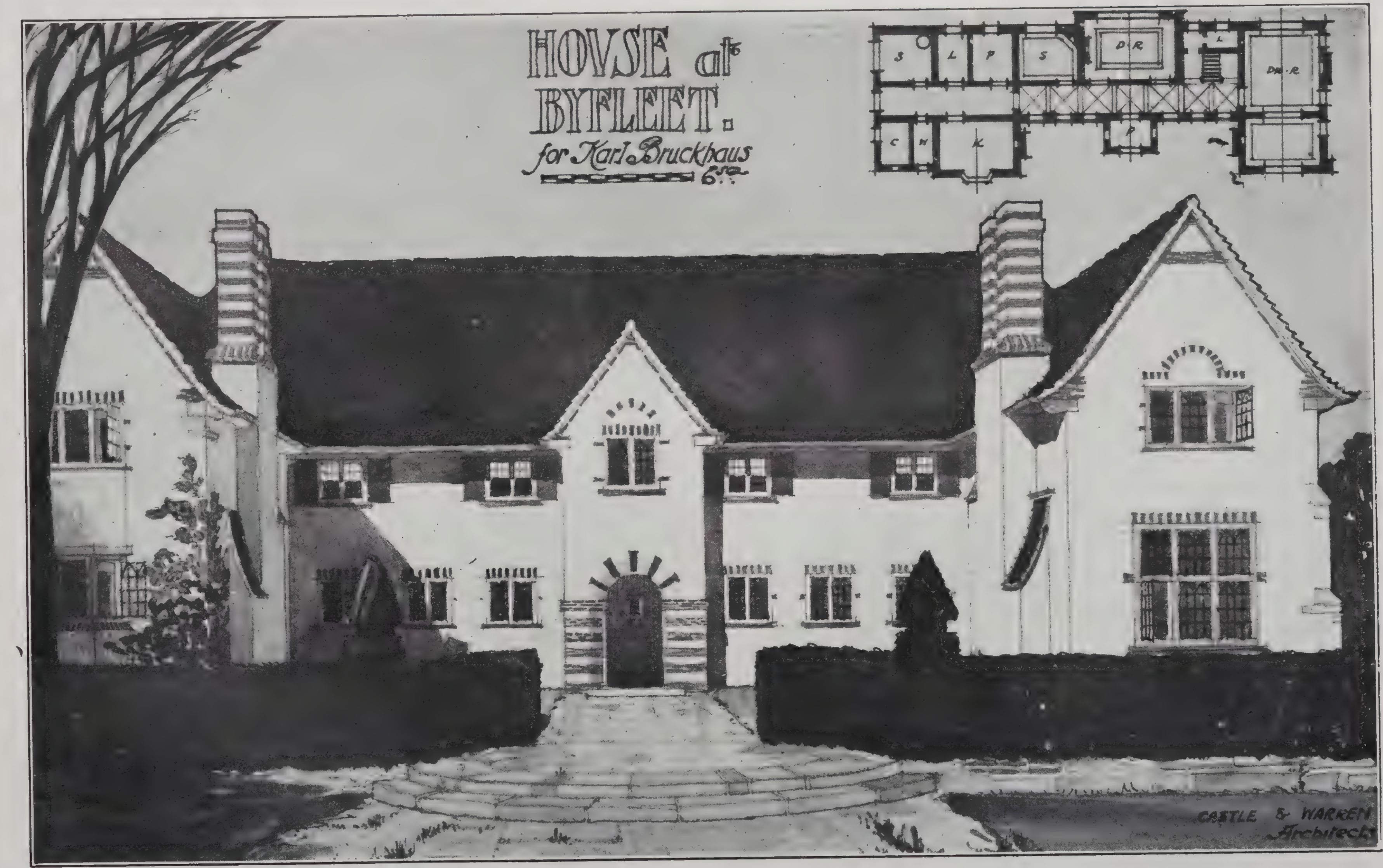

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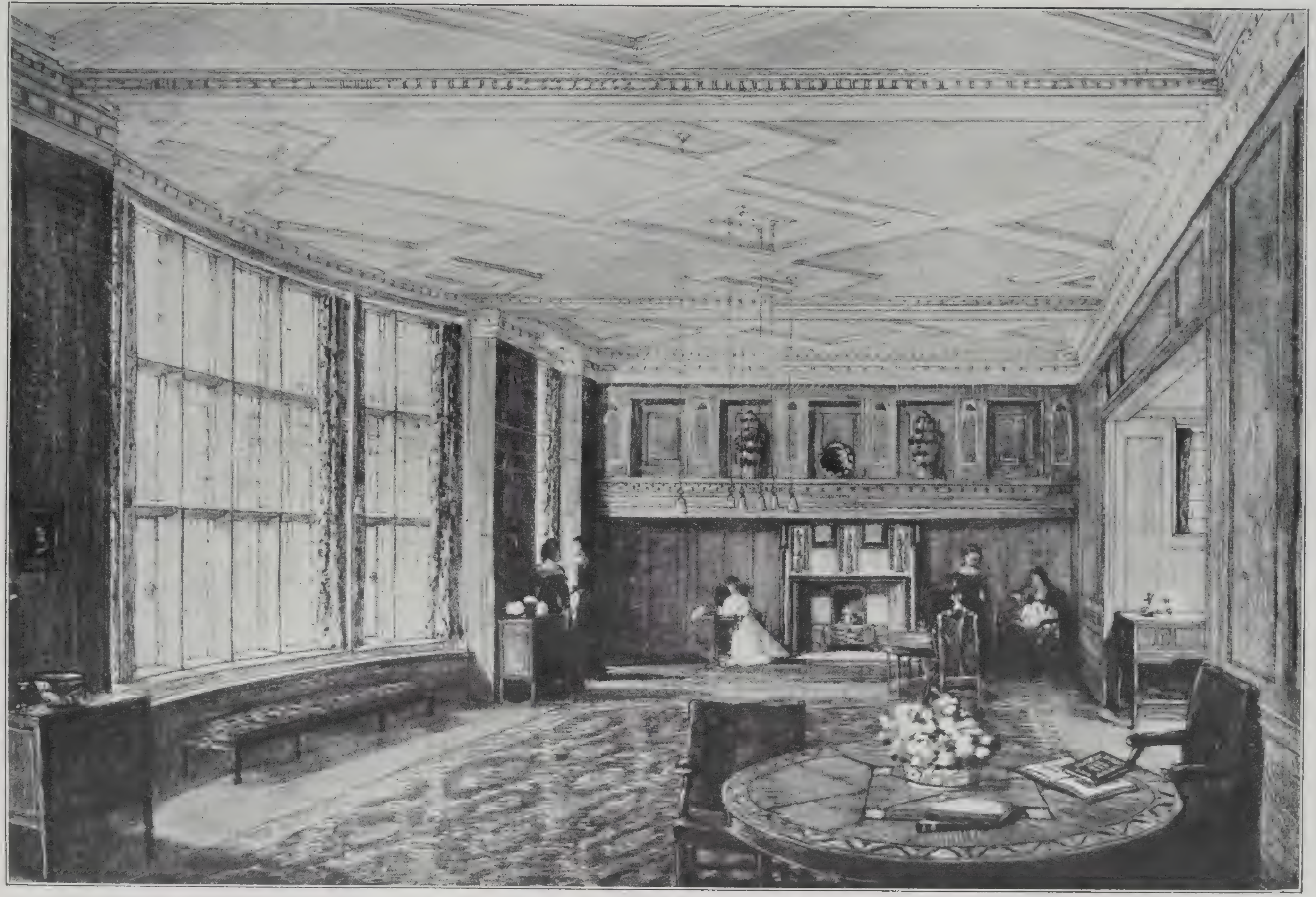

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A little southward of the Palace the high ridge ceases and falls into the woodland of Surrey—pre-eminently the suburban county of the future.

DESIGN FOR A SECONDARY SCHOOL.

The secondary school of which the design is shown on p. 125 is for the accommodation of 200 boys and girls. It is in the Georgian style, Luton purple bricks being used, picked out with Fareham red with a tile roof.

The interior treatment has been kept as simple as possible, the lavatories, cloak rooms, and entrance halls having glazed brick walling and floors of red quarry tiling, while the assembly hall and classrooms have deal panelling to a height of 3ft., with plaster above and floors of oak blocks. The headmaster's and mistress's rooms overlook the main entrances, and at the same time are within easy reach of the assembly hall and classrooms.

The science and art rooms have been placed on the first floor, and are to be used jointly. For this reason it was considered better to place the masters' and mistresses' common rooms and some of the classrooms on the first floor. The architect is Mr. F. D. Sowerby, Ingram House, Stockwell, S.W.

HOUSE AT FARNHAM ROYAL, BUCKS.

This house is built at Farnham Royal, near Slough, Bucks. All the best rooms have been planned to face the front, as there is a splendid view over the valley to Windsor Castle and district. The general walling is of rough stocks covered with cement rough-cast of a white tint, the plinth being of red and purple bricks. The filling between the half timbering is of cement plaster with a tinge of ochre. The porch is of Bath stone, with the joints slightly recessed with dark blue pointing, and roof covered with hand-made sand-faced tiles. The pitch pine joists and beams of hall and dining room are exposed, and stained a dark tint. The windows are lead lights with steel cores to the cames.

The architects are Messrs. Moscrop-Young and Glanfield, of 12, Buckingham Street, Strand, W.C., and the builder is Mr. H. D. Bowyer, of Slough.

Our Plate.

House at Byfleet for Karl Bruckhaus, Esq.

This house is to be erected at Woodham Lane, West Byfleet, in brick and smooth plaster, with old tiles for the roof slopes. The plan is arranged so as to obtain the best views from the principal rooms. The details will be of a simple character throughout, and 2in. Dutch bricks used where the brickwork is revealed to window-sills, etc. The window frames generally are to be in Oregon pine, but the dining room is to be panelled out of Austrian oak, and broad old oak beams revealed in the ceiling. The casements are to be in iron of a broad and flat section. A special feature is to be made in the treatment of the gardens. Messrs. Castle and Warren, of London, are the architects.

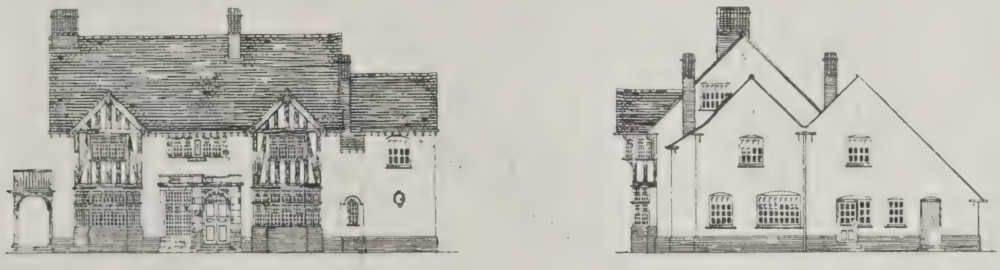
Additions to Brandon, Sheffield.

This interior is finished in fumed oak panelling with oak floors; the chimney pieces in marble of Verde Antico, Siena, and Arni vein. The masonry was by Mastin and Sons, Sheffield, and the woodwork, including oak, by John Booth, Sheffield. Mr. Edgar Wood, A.R.I.B.A., of Manchester, is the architect.

Mr. E. Douglas Hoyland, architect and surveyor, has removed from 2, Walbrook, E.C., to 10, John Street, Adelphi, W.C. Telephone, Gerrard 4783.

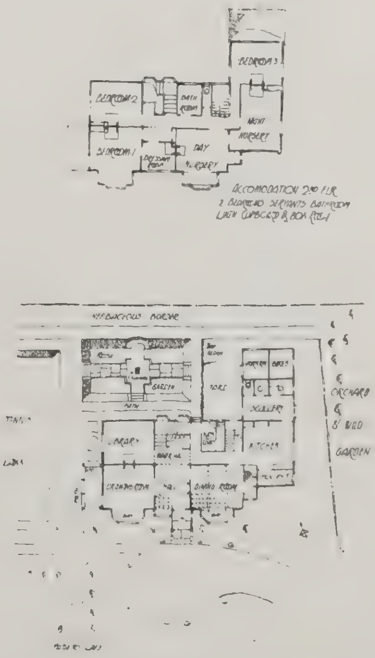
* * *

Advantage is being taken of the civic vacation to increase the provisions against fire at the Mansion House. The work is being executed for the Corporation on plans and suggestions made by Mr. Sydney Perks, F.R.I.B.A., City Surveyor. The general scheme is the separation of the Egyptian Hall from the domestic offices and state apartments by means of steel doors. Special attention is being given to the Egyptian Hall, as it is erected immediately over the kitchens. Iron and steel doors are also being erected in the state drawing rooms and the saloon, and an iron and glass screen will be placed at the east end of the Egyptian Hall. Iron gangways are being placed on the roof to facilitate the escape of the domestic staff, and fire alarms and appliances are being overhauled and hand extinguishers provided throughout the building. The cost of these works will be over £1,000. So far no fire has ever occurred in the Mansion House.



HOUSE AT FARNHAM·ROYAL·BUCKS·FOR·KYRLE·C·HANKINSON·ESQ·

MOSCROP-YOUNG & GLANFIELD Architects



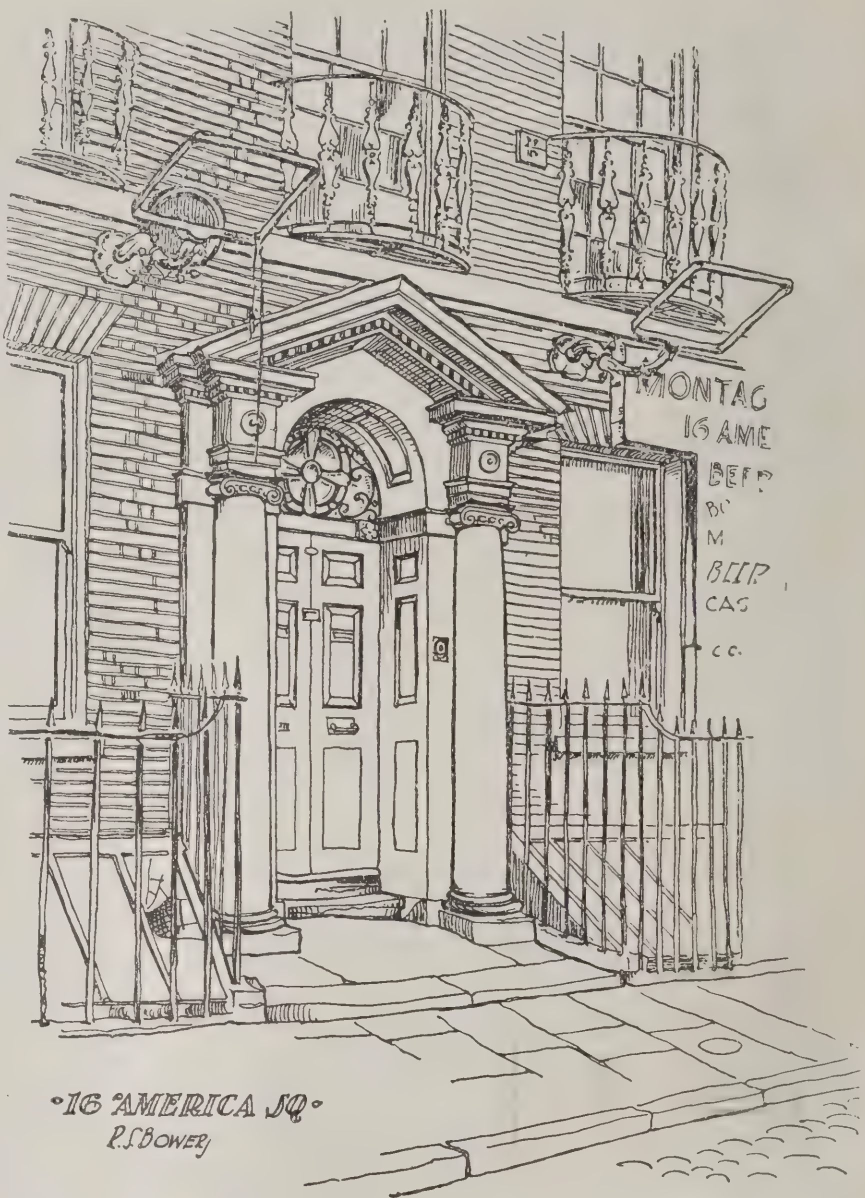
In this house, all the best rooms have been planned to face the front, as there is a splendid view over the valley to Windsor Castle. The general walling is of rough stocks, covered with cement rough-cast of a white tint, the plinth being of red and purple bricks. The porch is of Bath stone, with the joints slightly recessed with dark blue pointing, and the roof is covered with hand-made sand faced tiles.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Aug. 30	FOREST HALL, Elementary school for 250 scholars. County of Northumberland Education Committee invite designs from architects practising in the County and in the City and County of Newcastle-on-Tyne. Particulars, conditions, and plan of site from C. Williams, Secretary to the Education Committee, The Moothall, Newcastle-on-Tyne.
Aug. 31	HUDDERSFIELD NEW CHURCH. Plans are invited for a church to seat 400, to cost about £2,000, not to exceed £2,500, with all fittings, furnishings, lighting and heating apparatus. Plans to be forwarded to the Rev. D. Macrae Tod, B.D., St. James' Manse, Huddersfield, by Aug. 31.
Sept. 1	BRANCH LIBRARY, NEW CROSS, for Deptford Borough Council. Limited to Architects practising in the City or the County of London. Assessor: J. S. Gibson, Vice Pres. R.I.B.A. Premiums, £52 10s., £26 5s., and £10 10s., for three selected designs, and will be awarded in accordance with the conditions contained in the instructions to competitors. Site plan and copy of instruction from Vivian Orchard, Town Hall, New Cross Road, S.E. Deposit £1 1s., refunded on receipt of *bona fide* design or if instructions are returned within 21 days.
Sept. 1.	NEWBURN. Council Chamber Offices and Caretaker's house. The Newburn U.D. Council invite designs for these buildings to be erected in Newburn Lane, Newburn. Open only to Architects practising in Newcastle-upon-Tyne and in the County of Northumberland. The author of the design considered the best will, subject to the general instructions and conditions of the competition, be employed to carry out the work. A premium of £10 will be awarded to the author of the design considered second in the order of merit. The Council has appointed Mr. Richard John Leeson, of the firm of Oliver, Leeson, and Wood, of Milburn House, Newcastle-upon-Tyne, architects, as assessor. A plan of the site and a copy of the general instructions and conditions of the competition may be obtained from George Wilkinson, Clerk to the Council, 1, Mosley Street, Newcastle-upon-Tyne, on payment of a deposit of One Guinea, which will be returned on receipt of a *bona fide* design, or it the plan of the site and copy of the general instructions and conditions are returned within 14 days with a notification of non-intention to compete. The designs are to be delivered at the Clerk's Office, No. 1, Mosley Street, Newcastle-upon-Tyne.
Oct. 1.	ABERDARE HOSPITAL. The Aberdare Urban District Council invite competitive designs for a fever hospital for 52 patients, including administrative block, outbuildings, etc. Premiums of £100, £50, and £25 for the designs placed first, second, and third respectively. An Architectural Assessor will be appointed on the nomination of the President of the Royal Institute of British Architects: also a Medical Assessor to act jointly. Particulars and conditions of the competition, together with a plan of the site, may be obtained from T. Phillips, clerk, Town Hall, Aberdare, on deposit of £3 3s.
Oct. 11.	HULL TRAINING COLLEGE for Teachers in Elementary Schools. The Education Committee invites Architects to submit designs. Premiums of £150, £100, and £50 to authors of the designs placed 1st, 2nd, and 3rd respectively. Particulars and plan of site may be obtained of J. T. Riley, Secretary of Education, Albion St., Hull. Deposit, One Guinea, returnable on receipt of *bona fide* design, or the return of particulars within 14 days.



DOORWAY AT 16, AMERICA SQUARE, E.C. (NOW DESTROYED). DRAWN BY P. S. BOWERS.

Grimsby Town Hall Extension.

At the last meeting of the Finance Committee of the Grimsby Corporation it was decided to send the designs received in this competition to Sir Alfred Gelder, F.R.I.B.A., for adjudication. Since the competition was originally instituted a certain section of the Council has opposed every resolution for going forward with the scheme, and at the meeting in question the decision to send the plans to an assessor was only passed by 12 votes to 9. It further appears that the appointment of an assessor was not confirmed by the full Council. Though the Council has now decided to proceed with the adjudication of the plans, it does not seem certain that the extension will be started without further obstruction. The Borough Surveyor reported that 104 architects had applied for particulars; 45 had returned the papers and had their deposit refunded, leaving 59 deposits still in the hands of the corporation, and that 50 architects had sent in 51 designs, one of them sending in an alternative.

The Cornwall County Offices.

The Cornwall County Council has at last decided to proceed with the erection of its new offices at Truro, but the cost is to be limited to between £10,000 and £12,000, eliminating from the first design the Council Chamber, dining room, lavatories, retiring rooms, and modifying the plans as regards the caretaker's quarters and committee room accommodation. A special committee has been empowered to invite alternative tenders on a complete scheme. A motion to erect the offices at St. Austell was defeated by a considerable majority.

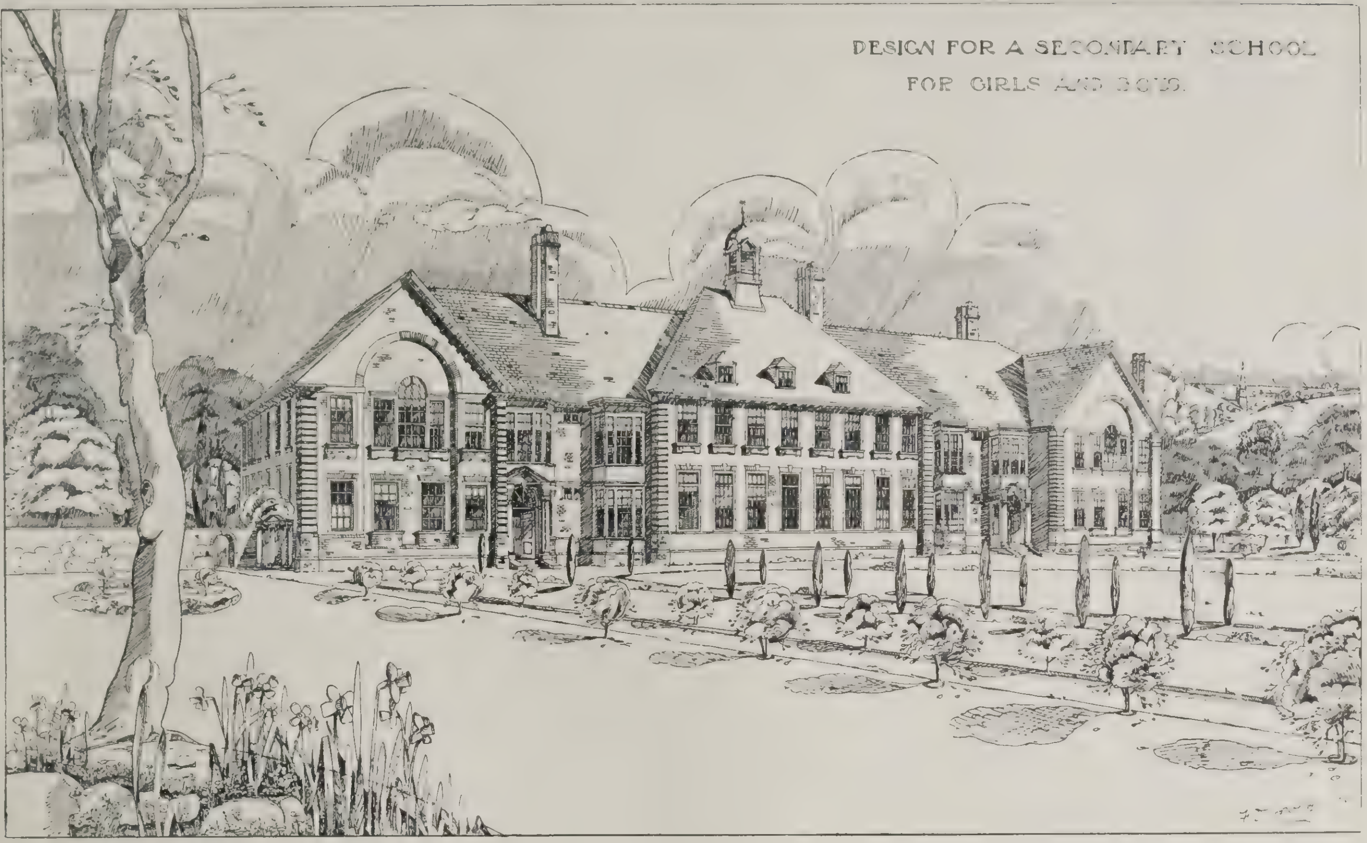
No. 16, AMERICA SQUARE MINORIES.

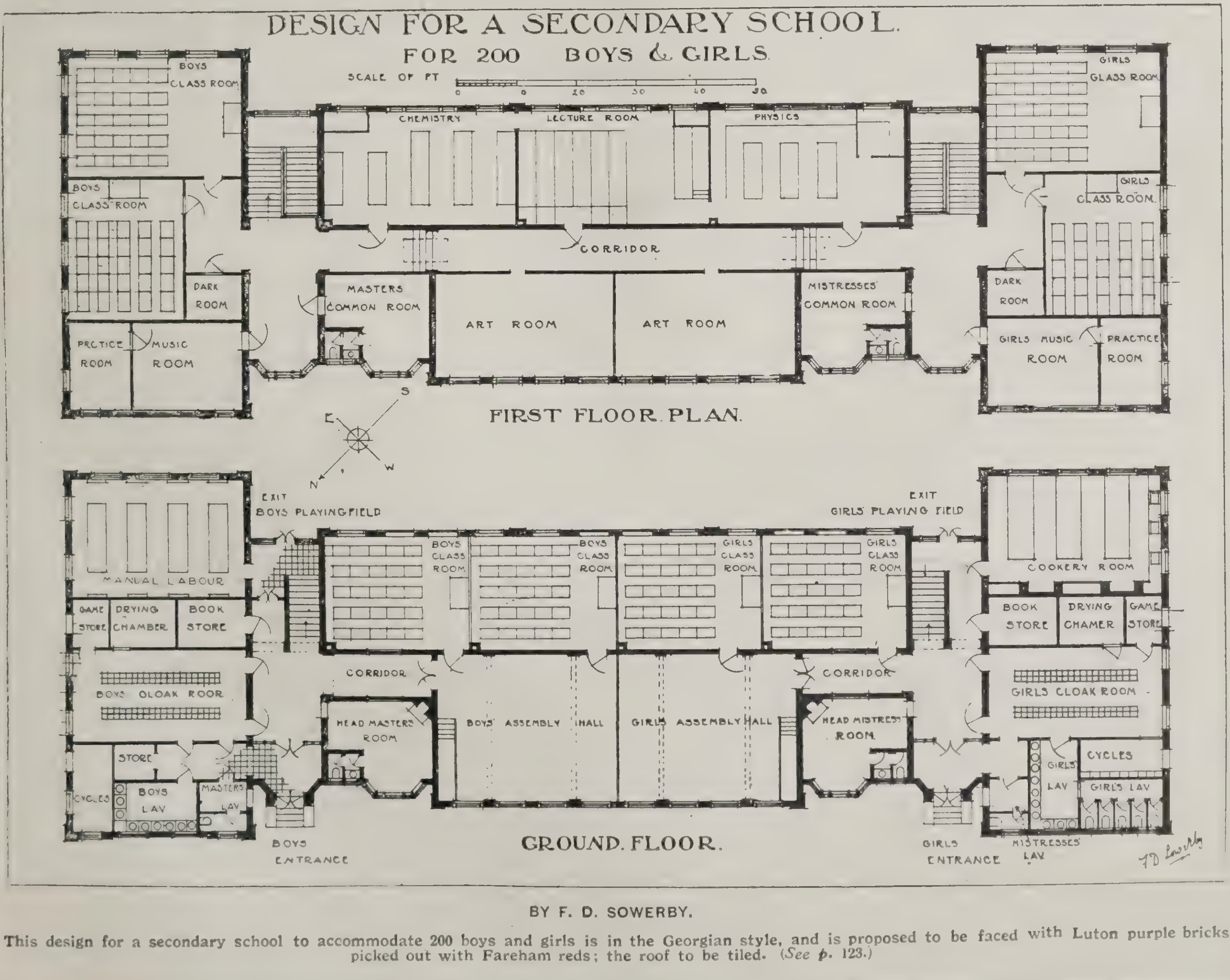
This is a sketch of the doorway to No. 16, America Square, just off the Minories, made prior to its demolition last year.

It may be recalled that on the site of this fine old City house a large portion of the wall built by the Romans around London was discovered, about ten feet below the pavement, as perfect and massive as when first constructed. In fact, the eighteenth century builder of America Square who used it as the footings for his real wall, but omitted to provide foundations elsewhere, had the fearful joy of watching the house settling in front only, and consequently tilting bodily over the street, a position it must have been in for many years.

One of the upper floors of this house had a window built across on the inside face, and inserted, as is sometimes found, simply to keep the regular spacing of openings on the elevation.

Malvern has a priceless possession in its old Priory Church, and Mr. F. Bligh Bond, F.R.I.B.A., has been appointed its consulting architect at the instance of the recently appointed Vicar, the Rev. Anthony Deane, and with the concurrence of the wardens.


DESIGN FOR A SECONDARY SCHOOL
FOR GIRLS AND BOYS.



BY F. D. SOWERBY.

This design for a secondary school to accommodate 200 boys and girls is in the Georgian style, and is proposed to be faced with Luton purple bricks, picked out with Fareham reds; the roof to be tiled. (*See p.* 123.)

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable: and it must be understood that both question and reply will, as a rule, be published in these columns

Stability of Vaulting.

BOLTON.—C. V. H. writes: "How can you calculate for the stability of the vaulting shown on the enclosed drawing?"

The vaulting is shown in section Fig. 1 and plan Fig. 2, but as querist does not give the weight of the stone or section of the ribs only an approximate answer can be given. Taking first the diagonal rib, with a section equal or equivalent to a rectangular section 8ins. by 5ins., as in Fig. 3, the loading will be as shown in the usual manner by means of Fig. 4, the curve of thrust may be drawn on Fig. 3. The maximum stress will be across space 3, then

$$\frac{W}{A} \pm \frac{M}{Z} = \frac{650}{40} \pm \frac{650 \times 1{\cdot}8}{\frac{1}{6}(5 \times 8^2)} = 16 \pm 22 = 38 \text{ lbs.}$$

per sq. in., or 2.45 tons per sq. ft. compression, and 8lbs. per sq. in., or 0.5 ton per sq. ft. tension. The short ribs, with a section equal or equivalent to a rectangular section 8ins. by 4ins., will be loaded as in Fig. 5, and by means of Fig. 6 the curve of thrust may be drawn on Fig. 5. The maximum stress in this case will be

$$\frac{W}{A} \pm \frac{M}{Z} = \frac{360}{32} \pm \frac{360 \times 2\frac{1}{3}}{\frac{1}{6}(4 \times 8^2)} = 11 \pm 19.7 = 30.7 \text{lbs.}$$

per sq. in., or 2 tons per sq. ft. compression, and 8.7lbs., or 0.56 ton per sq. ft, tension, which appears to be safe. It is usual in groining for the lower portions of the ribs to be formed out of bed stones, and those immediately above may tail more or less into the concrete. The curve of thrust may be worked out for the whole rib down to the bottom of concrete filling on the came principles.

HENRY ADAMS.

Engineering Examinations.

BRADFORD.—YORKSHIRE writes: "(1) What books do you recommend for preparation for the Assoc.M.Inst.C.E. examination (all sections). (2) What steps should student take on leaving college (and obtaining diploma) to become an engineering contractor?"

(1) Full information as to the books required (or recommended) for passing the examinations of the Institution of Civil Engineers will, we understand, be sent to an applicant intending to enter, if he writes to the Secretary at Great George-street, Westminster. Copies of papers recently set may be obtained from Messrs. W. Clowes and Sons, 23, Cockspur-street, Charing Cross, S.W., and these would give the best possible idea of the scope of each subject. When writing to the secretary for information as to books our correspondent should, if possible, state in which section he is chiefly interested. (2) The question as to the steps which should be taken after obtaining the diploma is one which can only be answered in a very "general" manner—so much depends upon the age, available capital, amount of influence obtainable and general circumstances of the applicant. Having made up his mind as to the nature and class of business in which he wishes to engage, he should correspond with firms who are eminent in that class with a view to obtaining a position in their works for a time: in such professions it is invariably necessary to obtain such practical experience and the question of premium payable or salary to be obtained would depend upon the influence of the applicant and the "standing" of the firm applied to. Finally, we may advise "Yorkshire" to obtain a book published by Messrs. Cassell and Co., La Belle Sauvage, London, E.C., entitled, "Choosing a Career," as it contains much useful information.

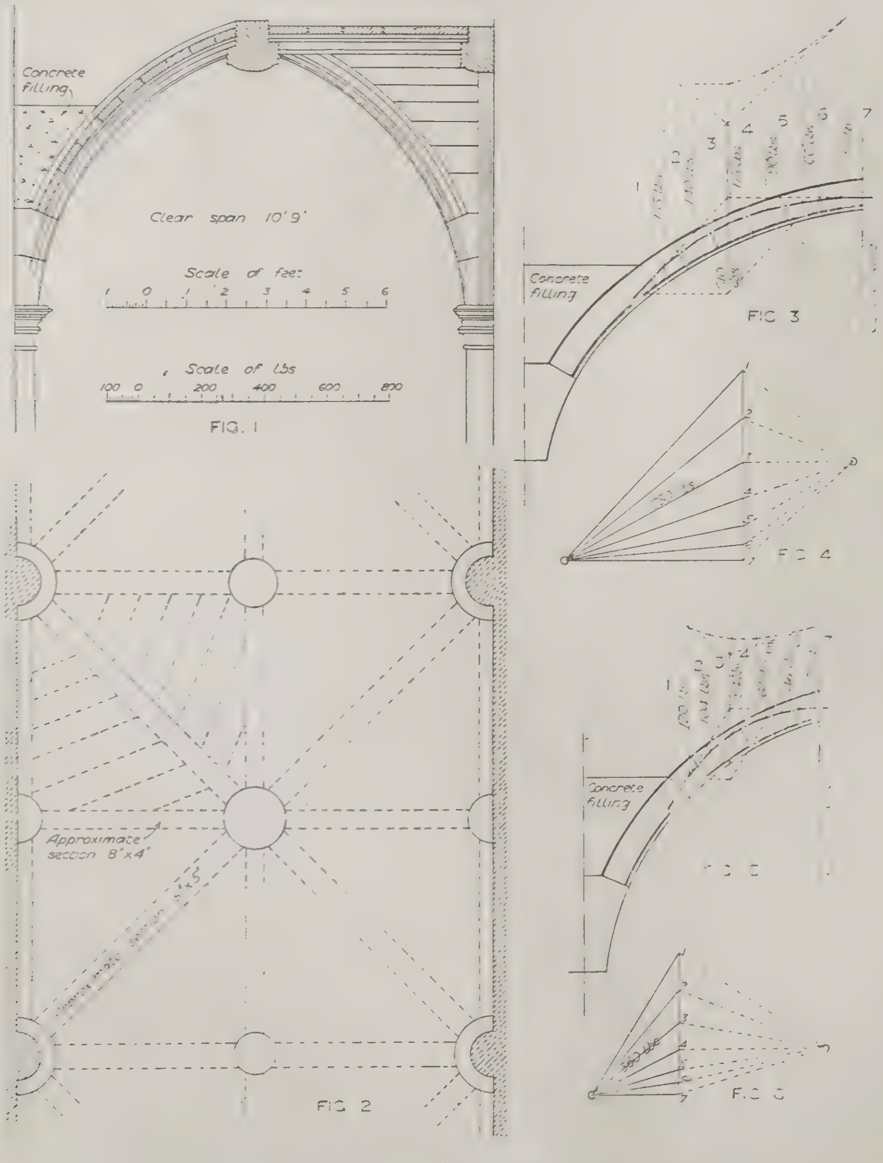
B. & B.

Steel Calculation.

EDINBURGH.—CONCRETE writes: On page 66, Specification No. 8, you will find the following:—"Let us next consider the insertion of 4in. by 1-16in. W.I. plates, with ¼in. cross rods, etc., etc. This gives us $5(4-\frac{1}{4}) \times \frac{1}{16} = \frac{75}{64}$ sq. ins. and $\frac{75}{64}$ sq. ins. × 5 tons (2240) × $3\frac{2}{3}$ ins. = 43,125 in lbs. How does this become 43,125 in. lbs.?

Why does he use 5 tons, which is the extreme fibre stress? In the next case he takes a mean the same as he also takes a mean for the concrete. I suppose the 3 2-3in. is arrived at as follows:—Depth of centre of stress in bar $= \frac{2}{3} \times 4$ ins. $= \frac{8}{3} = 2\frac{2}{3}$. Add 1in. for depth from N.A. to top of flat bar—$3\frac{2}{3}$. An explanation would be esteemed.

In the succeeding issues of "Specifications," the article referred to has been omitted. There is an obvious error to which our correspondent calls attention in the first paragraph, as regards the five tons being the extreme fibre stress. We may mention that the steel cube safely stressed to 7½ tons as the extreme fibrous stress. We see no reason in going into this at all elaborately now, as there has been considerable advance in connection with reinforced concrete during the last few years, and it is more useful to study the later theory of reinforced concrete. If our correspondent is particularly interested in the article he refers to, which is now out of date, we would advise him to communicate with the author.



STABILITY OF VAULTING. *(See Answer to "Bolton, C.V.H.")*

Proposed New Works.

BEXHILL.—The colonnade and bandstand shortly to be erected on the new Central Parade will provide accommodation for 500 people. The architect for the whole scheme is Mr. J. B. Wall, of this town.

CHIPPING SODBURY.—An inquiry has been made into the proposal to build a higher elementary school here.

DARNLEY.—It has been recommended that the plans of the proposed smallpox hospital be approved. The Local Government Board have agreed to the Joint Hospital Committee erecting the new hospital on a vacant site within the grounds of the present hospital, and its cost is estimated at £5,639.

DUDLEY.—It is estimated that the provision of a chancel and a lady chapel at the parish church will involve about £5,000. It is also contemplated that the foundation stone will be laid in October next.

DUNDEE.—The suggested alterations to be made to the Sheriff Court Buildings have been entrusted to Mr. J. Anderson, who is now engaged upon the preparation of a report.

FISHPONDS.—The original plans, prepared by Messrs. Lingham Barker, of Bristol and London, for the new church of St. John's, have been discarded on the ground of expense. The first part of the church to be proceeded with will, it is estimated, accommodate 500 persons, and cost £3,088, and the second section will provide for 200, and cost £1,892.

HUDDERSFIELD.—The Borough Engineer having reported that the present post office building could be very successfully adapted for the purposes of a County Court, Labour Bureau, and other Government purposes, it has been decided to erect a new post office on the south side of Northumberland Street, and to convert the present post office in the way suggested.

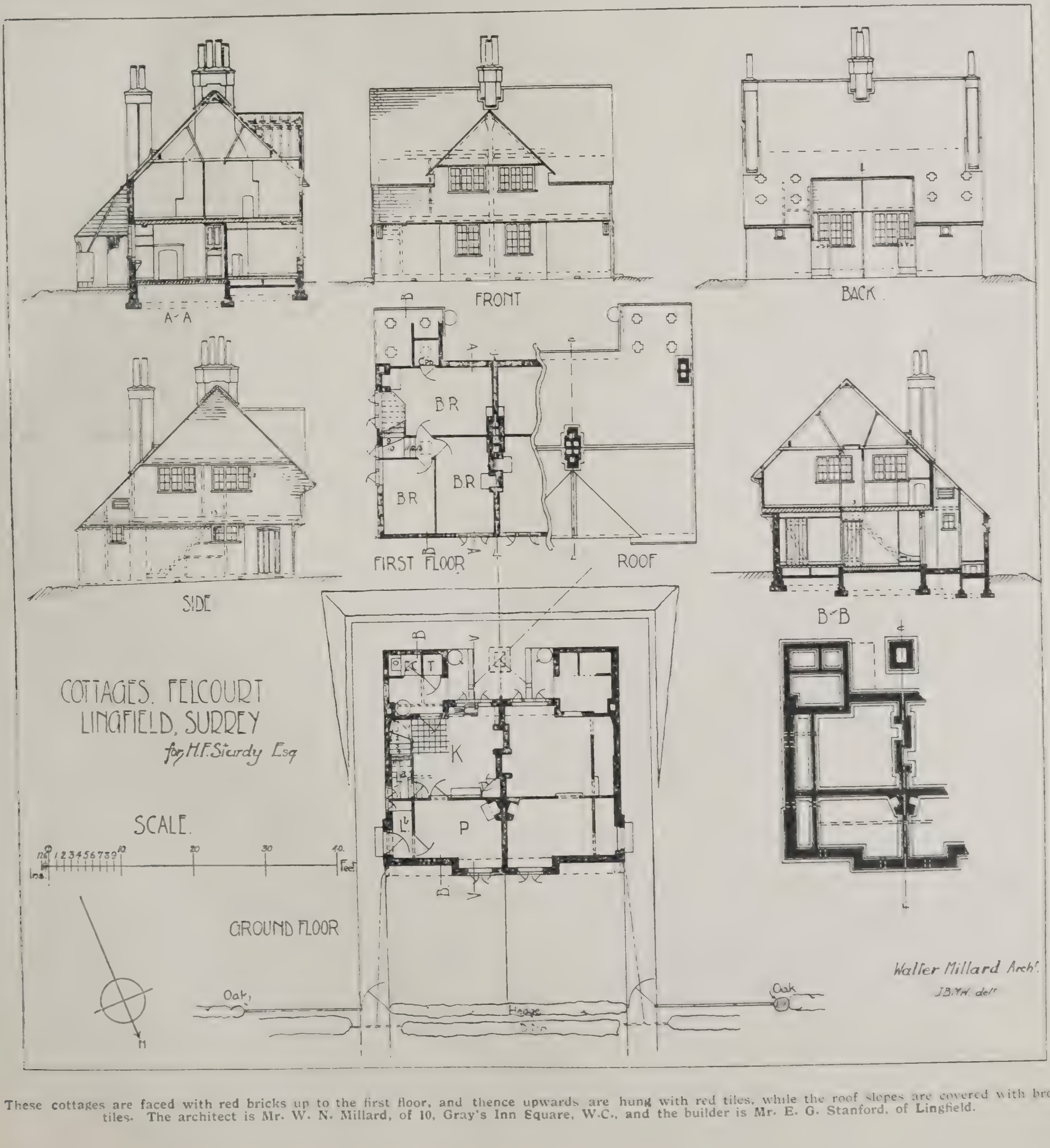
ILKESTON.—At a meeting of the Town Council it was decided that the Duke of Rutland be approached with a view to the provision of a site for the proposed new baths. The Mayor, with commendable discretion, submitted that the present moment was distinctly inopportune for any such action, if the Council's object was to obtain a site free of cost; but upon the explanation being made that the Council were not desirous of begging a site, the above decision was arrived at.

KIRKCALDY.—The Dean of Guild Court have passed plans for alterations on the shop at 18, Bridge Street. Messrs. R. Stocks and Company have been granted warrant to make extensions on their factory in Link Street, and plans for internal alterations at the King's Theatre have been passed. Messrs. M. Nairn and Company have been given permission to make alterations on their North Factory in Den Road, Kirkcaldy.

LINCOLN.—The sum of £2,000 presented to the Bishop of Lincoln on his seventy-ninth birthday for church extension in Grimsby, is to be given to the building fund of the new church of St. Luke, which will serve a poor parish of 10,000 souls. Sir Charles Nicholson's design for the church is conceived in the style of the fifteenth century. For the completion of the building as a thank-offering for Bishop King's episcopate, a sum of £4,000 will be needed.

LONDON (HARLESDEN).—Mr. Andrew Carnegie has consented to bear the cost of the enlargement of the Public Library. A lecture hall will be included in the additions.

LONDON.—Mr. Joe Elvin, the popular comedian, has propounded a scheme for the erection of a home for variety performers who are no longer able to support themselves. The proposed institution, which will include an orphanage, is estimated to cost £10,000.



These cottages are faced with red bricks up to the first floor, and thence upwards are hung with red tiles, while the roof slopes are covered with brown tiles. The architect is Mr. W. N. Millard, of 10, Gray's Inn Square, W.C., and the builder is Mr. E. G. Stanford, of Lingfield.

LONDON.—One by one London's heritages of the past in the form of old buildings are rapidly passing away. The latest disappearance to be recorded is that of the old office of the Ecclesiastical Commission, which moved a year or two ago to new palatial premises in Millbank. This is now in the hands of the housebreakers; and before long the whole of Whitehall Place will be entirely modern.

LONDON.—The Council have agreed to recommendations of the Building Act Committee consenting to the erection of an oriel window at 6 and 8, Ludgate Hill, on the application of Mr. R. Plumbe, on behalf of the chairman and directors of the Temperance Permanent Building Society; to the rebuilding of Mark Lane Station, on the application of Mr. G. Sherrin, on behalf of the Metropolitan and District Railway Companies; to the erection of a building on the site of 2 and 3, Furnival Street, on the application of Mr. C. H. Townsend, on behalf of the Food Reform Co., Ltd.; and to the uniting of 1 and 12 with No. 11, Paternoster Buildings, Paternoster Square, on the application of Mr. A. R. Conder, on behalf of Messrs. Morgan and Scott.

MANCHESTER.—The erection of a new reference library is contemplated here; but, owing to some difficulty in regard to the site, the whole matter is in abeyance for the present.

NEWCASTLE. — Negotiations with the Corporation for the construction of a stadium in the Ouseburn are now proceeding. It is hoped that the structure will be ready by next June.

SEAHAM.—The proposal to build a new public elementary school for about 480 children at Seaham Harbour, and another such school for about 450 childen at New Seaham has resulted in an inquiry into the effect that the erection of these buildings will have upon the rates.

STOCKPORT.—The directors of the Stockport Mechanics' Institute have decided to accept the offer of the Corporation to pay £2,150 for the building and site, and to take over the staff, in order to provide a site for the new library which Mr. Carnegie has offered to build at a cost of £10,000.

WALLSEND.—The surveyor has received instructions to prepare plans showing the amount of land required for the provision of a swimming bath 80 feet by 30 feet, 12 slipper baths, etc.

WELTON.—It is estimated that the cost of a new school, the site of which has been conditionally promised, will be £1,200.

WREXHAM.—A scheme for the erection of a church house and three churches in the district is estimated to involve an expenditure of £13,000. Messrs. Prothero, Phillott and Barnard, architects, of Cheltenham, are responsible for the whole of the designs.

Works in Progress and Completed.

BOLTON.—A new monolithic monument, shortly to be erected here as a war memorial, presented by Mr. George Harwood, Liberal M.P. for this town. The shaft, which has been cut from the granite quarries of Messrs. Duke and Co., of Merrivale, near Princetown, is 20ft. high, and has a base of 10ft. diameter. On the top of the column is to be fixed a bronze cross, and on the four sides of the square upon which the column immediately rests, are to be placed bronze shields, depicting scenes in the war.

BRADFORD.—The extension to the Town Hall is now proceeding at a rapid rate, and will probably be officially opened at the end of next month. The exterior has been finished for some considerable time, and the interior is now approaching a state of completion. Mr. F. E. P. Edwards, F.R.I.B.A., associated with Mr. Norman Shaw, R.A., is the architect.

CHORLEY.—An extension to St. Peter's Church, estimated to involve a sum of £3,500, is now proceeding. The scheme, which includes the removal of the chancel and the enlargement of the transepts, will provide additional accommodation for 306 persons.

CARDIFF.—The second of four workmen's institutes, provided by Mr. John Cory, was recently opened. The premises formerly used as a mission hall have undergone many structural alterations, the architect being Mr. William H. Scott, and the builder, Mr. Edgar Brown.

CATCLIFFE, NEAR ROTHERHAM.—The foundation stone of the new church, which is to be dedicated to St. Mary, was recently laid. The church has been designed in a free Gothic style by Mr. J. E. Knight, of Rotherham, and, when completed, will accommodate 300 people. The estimated cost of the building, including furniture, but excluding the organ, is £3,000. The contractors were Messrs. Thomas Roper and Sons, of Sheffield.

DUBMIRE, NEAR FENCEHOUSES.—A new workmen's institute has been erected here. The architect is Mr. W. Pallister, of Philadelphia, and the contractor Mr. R. H. Harrison, of Houghton-le-Spring.

HUDDERSFIELD.—The new Palace Theatre recently opened here has been designed by Messrs. Richard Horsfall and Sons, who are also the architects of an almost identical building at Halifax. The new theatre will seat, roughly, about 1,600 people.

HURSTPIERPOINT, SUSSEX. — The foundation stones of a new Wesleyan church were laid here recently. The church will accommodate about 150 people, and a schoolroom at the back will seat another 100. The contract, which is in the hands of Mr. King, of Hurstpierpoint, amounts to £1,350.

LONDON.—It is stated that Messrs. Wm. Arrol and Co.—the firm that has been employed upon the Blackfriars Bridge extension—are likely to gain about £3,500 in bonus. This has been brought about by the expeditious way in which the work has been carried out, whereby the authorities forfeit £20 for every day from the conclusion of the work to the expiration of contract time. The work is now practically complete, all that remains to be done being the repaving of the old part of the bridge; and by the end of the present month, or at latest the first week in September, the widened bridge will be available for traffic. With the present addition of 30ft. the width of the bridge will be 105 ft. between parapets, making it the widest bridge across the Thames. The new roadway is 73ft. wide and the footpaths each 16ft. wide. The whole of the bridge has been repainted. With the exception of the shore span on the northern side, the old face ribs and parapets have been utilised for the new western arches, and the methods employed for moving these huge masses of material, weighing 120 tons, from the old to the new site without dismantling show great ingenuity. The subways now under construction at the northern end of the new bridge will also be completed at an early date. The scheme adopted provides for two shallow subways between the Thames Embankment and Queen Victoria Street, each 10ft. wide and 8ft. high. The more important subway, that from the Embankment to the corner of Bridge Street and Queen Victoria Street, is completed except for the tiling; work on the second subway should be finished within three months from the present time. The difficulties of the work have arisen out of the necessity of diverting two 24-inch and other large gas mains of the Gas Light and Coke Company, as well as water mains. In connection with the second subway it will be necessary to reconstruct the crown of the Fleet sewer and to divert the main supply cables of the Charing Cross, West End, and City Electricity Company.

MIDDLESBROUGH. — Works to be known as the Ormesby Rolling Mills, on land to the south of the Cargo Fleet Ironworks, are now in course of erection.

NEWCASTLE.—A memorial to the late Bishop of Newcastle (Dr. Arthur Lloyd) was recently unveiled in St. Nicholas' Cathedral. The design of the tomb, together with the necessary alterations to a carved screen, was entrusted to Messrs. Oliver, Leeson and Wood, architects of Milburn House, Newcastle, and the work has been executed by Mr. R. Beale, also of that city. The recumbent figure, the outstanding feature of the memorial, is the work of Mr. F. W. Pomeroy, A.R.A.

NEW INN.—The foundation stone of a new Wesleyan church, which is being built here, was recently laid. The edifice is estimated to seat about 130 worshippers. Mr. D. C. Udell, Pontypool, is the architect, and Mr. W. H. Campbell, Pontypool, the builder. The scheme is expected to cost about £500.

ROSYTH.—Work in connection with the erection of a large model lodging-house or working men's hotel at Jamestoun, near Rosyth Naval Base, is temporarily at a standstill. From £10,000 to £12,000 was set as the cost of the building, which was to be four storeys in height, was to provide accommodation for 600 lodgers. The building contractors were Messrs. J. J. and P. M'Lauchland, Larbert, and they have withdrawn their men and plant from the work. Labour and material have been expended on the work to the value of between £2,000 and £3,000, the outside walls having reached the second storey.

RAMSEY.—The foundation stone of the new Catholic Church of Our Lady of St. Maughhold's has been laid. The church stands in a commanding position on the Ramsey Promenade, along with the presbytery and tower. The total cost will reach over £4,000.

SEAHAM.—Foundation stones of the new Stewart Street Primitive Methodist Church at Seaham Harbour have been laid. The new church will have seating accommodation for over 300 persons, and, later, school premises will be added.

In the 32nd annual report of the Society for the Protection of Ancient Buildings the committee draws attention to threatened destruction of ancient houses in Bath Street, Bath, and expresses its deep regret that the City Council should have given its consent to a scheme which will result in the practical destruction of the houses on one side. The works of repair to the stonework of the upper storey of the college houses at Eton are approved. As the result of an inspection of the works in progress at Glastonbury Abbey, the committee considers that the repairs which so far have been carried out at the ruins are necessary for their preservation. It feels, however, that the more the use of new freestone is abstained from in such works the more harmonious is the final result, as dressed ashlar strikes a discordant note, which with undressed stone is not the case. The rector of St. Margaret's Church, Walmgate, York, has informed the society that nothing definite has been decided with regard to the ancient sculpture in the porch of that church, which, according to a statement in the Press, was to be substituted by modern sculpture made in imitation of the original work. The committee urges that the old work, even in its weather-worn state, would be infinitely more valuable than a "restoration" under best conditions, and expresses a hope that the necessary £30 for this purpose will be promptly subscribed. Burnham Ulph Church, Norfolk, which appears to have been built in the thirteenth century, has had its original character and appearance destroyed. Some years ago the roof was renewed in pitch pine, and the two windows in the south wall were rebuilt with new stonework. Among other buildings reported upon are Ashwell (Herts) Church tower, Barrington Court, Somerset, Bolsover Castle, Derbyshire, Town Hall, Cirencester, Donington Church, Lincolnshire, Dymchurch Church, Kent, Fincham Church, Norfolk, and Heston Church, Oxon.

THE R.I.B.A. EXAMINATIONS & RECENT MODIFICATIONS.

The number of queries which have reached us respecting the alterations recently made in certain subjects of the R.I.B.A. examinations leads us to believe that it would be useful to student readers of this Journal to give some advice and information under the above heading, but we would at the same time add the caution that it cannot yet be said that finality has been reached either in the form or scope of the various subjects.

Generally it may safely be said that a candidate carefully prepared to enter the examinations in their original form would have but little difficulty in passing the same examinations as now amended or under any further probable modification. In other words, the scope of the examination is not increased, nor the difficulty of satisfying the examiner greater, if one may judge by the first set of questions under the new rules.

The chief points of difference from former papers lie in the form which the questions take and the division of the subjects, the latter being now less cumbersome and more simply classified, while in the former there is now more scope for literary ability, and, in consequence, probably a little less premium upon "clever" draughtsmanship.

There is at present no indication at all of any tendency to alter or modify what may be called the "science" part of the examinations, either intermediate or final, nor is it probable that any essential alterations can be made except such as are due to the modifications in method which are constantly taking place under modern conditions of construction. For instance, just as hitherto the methods required in the examination for the calculation of steel structures have been only such as the average practitioner of architecture could reasonably be expected to carry in his head—the methods of the engineer being rather discouraged than otherwise—so in dealing with reinforced concrete work the examiners appear to regard the principles involved as of greater importance than any detailed knowledge of the formulæ employed—the latter have not been required up to the present even in their simplest form.

In applying a closer scrutiny to the modifications it will be well to analyse the questions recently set in the summer examinations, and for this purpose to divide the subjects into two parts, dealing first with the intermediate; but before we proceed to do so, it might be well to call attention to the supplement to the R.I.B.A. Journal, recently issued to members of the Institute, in regard to the proposed reconstruction of what may be called the Examination Department. As all intending candidates can obtain access to this supplement, it is hardly necessary to recapitulate the proposals therein made; moreover, any further modifications affecting candidates are not at all likely to come into force during the next two or three examinations; again, it may further be safely said that it cannot even then make any serious differences in their chances of success, provided that they have a reasonable knowledge of their profession in its "æsthetic" and its "scientific" as well as in its "business" aspect. Practice and methods of routine can only change imperceptibly; the science of construction rests on fundamental principles, which can only be changed in the sense that knowledge increases from day to day: the Art of Architecture can only be modified to suit the gradual changes made to meet modern needs, and must always be founded on the same undying principles exemplified in the finest examples of past "styles."

Referring now to the questions recently set, we find that there are still four papers in the Art section and three in the Science section; of the first four papers the first three deal with the history of the styles in chronological order, the fourth being a general paper which embodies the new principle, viz., "The purpose of Architectural features in relation to the Buildings in which they occur." The whole arrangement of this subject is obviously a great improvement on the former method, and the modification would be sufficiently justified by the inclusion in one "subject" of the whole of classical architecture on the one hand, and the coupling in the second subject of the European with English Mediæval Architecture instead of the former arrangement (Renaissance being now more logically kept distinct and alone in the third paper), even if it were not to emphasise also the "Purpose of Features." The set of papers is now obtainable from the Secretary R.I.B.A., No. 9, Conduit Street, W., in pamphlet form for 1s., so that reference will only be made to the questions by number. No notice will here be taken of the questions set expressly for relegated candidates. Paper I.—Questions 1 to 5 were for relegated candidates. Question 6.—This question is of a critical and analytical character, but involves only such knowledge as was formely required, and might be answered by any candidate possessing a knowledge of the plan and general arrangement and construction of parts in the Parthenon, such as may be obtained in the usual text-books. Question 7.—This question calls for a knowledge of the details of skyline and profile in section of the Orders and Temple buildings generally, and a careful analysis with freehand sketches of the usual external ornaments, such as the acroteria, antefixæ, etc., would form an important part of the answer calling attention to the constructive points emphasised thereby: contours of the principal mouldings showing how weathering and drips were obtained would also be useful. Question 8 is really an extension of Question 7, and the same general knowledge is required, but in this case the need for historical information as to actual examples is emphasised.

It is noticeable that in this paper, with the exception of parts of the first five questions which were primarily intended for relegated candidates (though they were permitted as an alternative to any candidate who preferred to take them), no attention whatever is paid to Roman Architecture, but it is quite conceivable that on another occasion the position might be reversed; and the moral, from the student's point of view, is not, we think, that Grecian Architecture is more important than Roman, but that every candidate is expected to be fully conversant with each branch of the subject. We shall have some further remarks to make about this feature of the R.I.B.A. examinations in dealing with Subject VII.

Subject II.—Mediæval Architecture.

In this and the following papers no special questions were arranged for relegated candidates: from this it may be seen that in the view of the examiners, those who had prepared to be examined under the old system should have been capable of making a satisfactory attempt under the new—in other words, that the knowledge required was not regarded as being greater nor essentially different; those candidates who had already passed in part of the subject under the old regulations were informed that only a low percentage of marks in this and the following paper would be required.

Question 1.—This question may be called a "stock" question in a slightly different form —every candidate should be able to sketch and discourse upon the various forms of Gothic window arches; but again it is noteworthy that actual examples are preferred, and this should emphasise the great importance of sketching and measuring from the work itself rather than from drawn examples alone.

Question 2.—This is a "rider" to the first question, and requires additional knowledge of detail, mouldings, and constructive masonry.

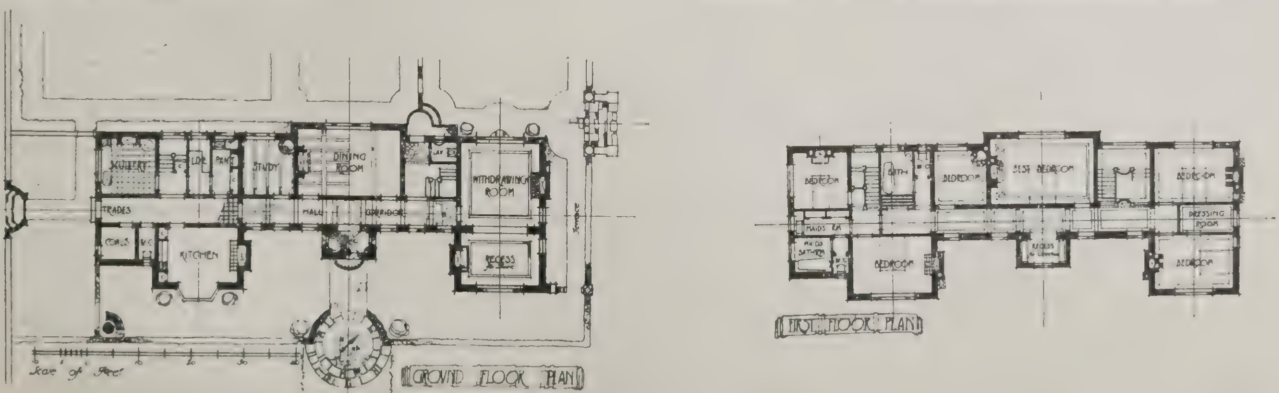
Question 3.—This is just such a question as frequently occurred in Subject IV. of the old regulations, and is perhaps of a more advanced type than the last, but should, none the less, be quite within the powers of a student of average capability, who has used his analytical faculty in comparing two or three of the Tudor examples with those which went before. The "illustrative sketches" are again required.

Question 4 is more on the lines of questions 1 and 2, and involves only the elementary knowledge of typical details which would be readily obtained by a day or two conscientiously spent in sketching small details from three churches typical of the Gothic "Periods."

Altogether it may be regarded as an eminently fair paper; only one question out of four needs special knowledge or treatment.

Paper III.—Renaissance Architecture.

This paper is distinctly simpler than the type of paper formerly set under the subject known as "Outlines of Mediæval and Renaissance"; for instance, in the first and third questions great latitude is allowed, for in the first question every student of architecture should be able to give a tolerable sketch of a façade of one at least of the many examples in almost any district in England of Jacobean manor houses, or, failing this, of some French Renaissance façade; nevertheless, most of those who entered for the examination seem to have taken refuge in the third alternative, and given a façade of one



HOUSE AT WEST BYFLEET, SURREY. PLANS. CASTLE AND WARREN, ARCHITECTS. (*See Centre Plate.*)

of the Florentine or Venetian palaces. In the third question, Brunelleschi, Palladio, Michael Angelo, and one of the Mansards, were probably the most frequently chosen. In the second question the word "perspective" sketch caused a good deal of trepidation, but it is not an unusual form for the question to take, and of course it is only a sketch roughly drawn in perspective that was wanted; it is a striking instance of the want of the power of accurate observation among those by whom such a habit should be most carefully cultivated, that many London candidates chose rather to draw the Italian feature than the London steeple; prospective candidates resident in London would be well advised to take a very great deal more trouble to study the numerous examples of architecture immediately around them rather than rely solely upon a book knowledge of foreign examples; if books alone are to be the source of information we would urge the importance of referring to the larger works, obtainable at the A.A. and R.I.B.A. reference libraries, or to the large plates of measured details that are published from time to time in this and other journals; let us also emphasise the importance to every architectural student of forming a collection of such plates for himself, as the very fact of searching for and arranging such illustrations helps materially to impress the building itself upon his mind, indeed, next to actually visiting and measuring the building, this is perhaps the most valuable source of study in the historical side of the subject. The last question in this paper is a very favourite one with the examiners in one form or another; for instance, in the Model Answers to the R.I.B.A. examination papers that appeared in this Journal during 1906, a very similar question occurred. Of course, the three periods in which the effects appeared most evidently were, first, during Henry VIII.'s reign, when he brought over Italian workmen for his father's tomb; secondly, during Jones's life, when Palladio's works were exerting a great influence on English work; and thirdly, when Wren returned from his studies in France deeply influenced by Vignola's teachings.

Paper IV.—General History of Architecture and the Purpose of Architectural Feature in Relation to the Buildings in which they occur.

This was the paper that probably aroused most interest, as it was in this, ostensibly, that the new subject was to be first treated, although in reality for some years past the questions have been becoming, generally speaking, far more critical, and the principles involved have been touched upon, as well as the historical or archæological facts; a knowledge of "Origin and Development" has often been required, and in other respects also there were few innovations in this paper; certainly a selection of only four out of six questions allowed ample choice, and this is a precedent that might probably be wisely followed to a somewhat greater extent than in the past. Dealing with the questions themselves, the first one, of course, was meant to bring out the fact that in Italy the Renaissance movement was rather a revival of the Ancient Roman architecture, tinged with Byzantine influence, than a development of the Gothic, which had indeed always been a foreign growth without much root, and which really brought far less influence to bear on the Renaissance than it did in the Northern Countries of Europe, where it was indigenous.

The second question is really in strong contrast to the first, and covers a very wide field; it was, of course, the arch compared with the lintel construction, and the *emphasising* compared with the *hiding* of constructive detail, the general necessities of the plan expressing themselves naturally in the elevation compared with strict symmetry often over-riding the utilitarian needs of the plan. The third and fourth questions can be taken together, the Byzantine style being the Eastern architectural development during the period mentioned, and being compared with what is known as the Early Christian work in Italy itself.

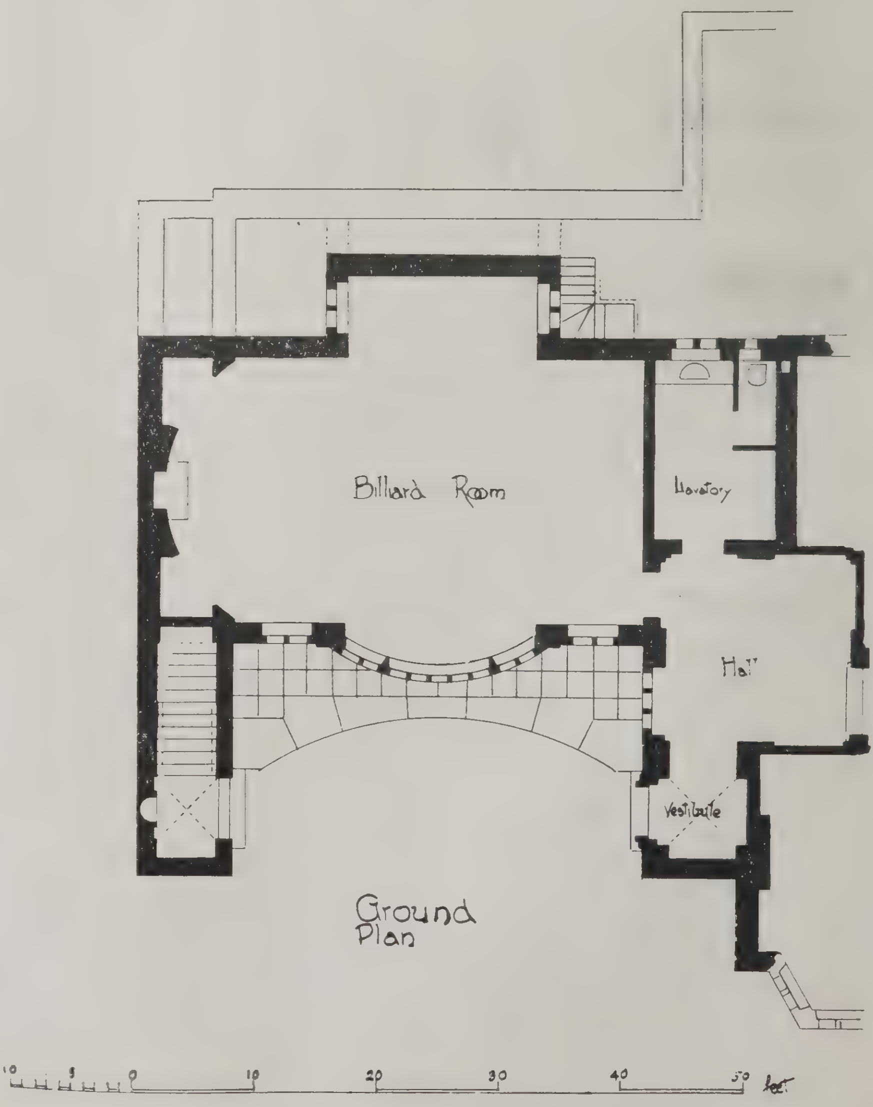
The fifth is a question which often used to occur in the "Outline" paper under the old order of things, and an answer can be found in the series of model answers already referred to. The last question should have given no trouble to anyone interested in his studies, and it encourages a critical observation of the buildings around one which is greatly needed among students, as has been hinted before; it is generally much easier to find a building we admire than to give our reasons for our preference, and it would be a good thing, in view of such questions, for intending candidates to read such a book as Mr. Belcher's, on "Essentials in Architecture."

The rest of the papers and those set in the final will be treated in a further article.

Societies and Institutions.

The Junior Institution of Engineers.

The summer meeting of the Junior Institution of Engineers in the Midlands opened on Saturday morning last, at Leamington, with a welcome by the Mayor Councillor, Alfred Holt, J.P. In the afternoon Warwick Castle was visited, and in the evening there was an illuminated concert in the Jephson Gardens, by invitation of the Town Improvement Association. On Monday morning Messrs. Muntz's Metal Works and Messrs. Joseph Gillott's pen manufactory were visited; in the afternoon the James Watt Museum. Yesterday morning the members were received at Redditch by the Birmingham local section of the institution, and visited Messrs. Shrimpton's needle manufactory, and Messrs. J. Warner and Sons' fish hook and fishing tackle manufactory. In the afternoon the Shakespearean features of interest at Stratford-on-Avon were seen. To-day will be occupied in a visit to the mechanical, electrical, and civil engineering departments of the Birmingham University, the afternoon being devoted to visits to the Austin Motor Co.'s works, and the works of the Birmingham Small Arms Company. To-morrow (Thursday) Coventry will be visited, the morning being spent at Messrs. Herbert's machine tool works, and those of the Triumph Cycle Company, and the afternoon in visiting the new gas works of the Coventry Corporation at Foleshill, and Messrs. Rotherham's watch factory. Messrs. Cadbury Brothers entertain the members on Friday morning at their Bournville Works, and for the afternoon Messrs. Elkington's electro plating works will be open for visiting. The Institution's summer dinner takes place in the evening at the Great Western Railway Restaurant, Birmingham, and on Saturday morning the Summer Lane Electricity Works of the Birmingham Corporation will be seen, the afternoon being occupied with a visit to the electric signalling apparatus of the Great Western Railway at Snow Hill Station.



ADDITIONS TO BRANDON, SHEFFIELD. EDGAR WOOD, A.R.I.B.A., ARCHITECT.

(See Centre Plate.)

CONCRETE AND STEEL SECTION.

(MONTHLY.)

Steel Concrete. "Ferro-Concrete" is a term that might be more appropriately applied to such a composition as that described recently by Mr. Leon S. Moisseiff rather than to reinforced concrete in the general sense. It will be understood how by the incorporation of a large proportion of steel wire nails, steel wire and scrap iron in cement and sand mortar, the compressive resistance was enormously increased. The cost of such a material is very considerable, but it has its uses. The strength developed in the tests was very remarkable, and a wonderful increase over plain concrete occurred at the short period of seven days. The highest stress developed was 17,800 lbs. per sq. in. on a 6in. cube 15 months old, while some 12in. cubes could not be broken in the machine, and tend to show that the material will show still greater strength in bulk. Failure in compression is nearly always failure in shear, and these tests demonstrate this very forcibly. The reason why the steel nails increased the strength of the concrete must obviously have been by strengthening the material against internal shear stresses. We seem to be learning something new about concrete every day, and reinforced concrete construction as it develops throws interesting side lights upon the structure and properties of all materials. The experiments on spirally-hooped columns described in our columns about two years ago by M. Considère, also have their bearing upon this problem. It was then shown how the application of hydraulic pressure to the outside of a specimen under vertical loading increased the shear resistance of the piece, in just the same way as the spiral hooping. That is another way of strengthening the concrete against the shear stresses that destroy it in crushing. The compression specimens are usually made in the form of cubes, but these should be higher so as to allow of the material shearing normally. The resistance developed by a proper specimen (the height of which should be 1½ times the length of the side) is less than that obtained from the cube. That, however, is only an incidental feature, though it has its bearing on the subject of shear stresses. Some experiments, too, conducted by a specialist, in which columns had ties across the section as diagonals, as well as the ordinary circumferential ties. These diagonal ties seemed to develop the strength of the core. And no doubt their action was to increase the shear resistance. The above-mentioned experiments with nails should now be supplemented by further experiments on a more extended scale, so as to thoroughly elucidate the internal stresses, to determine the modulus of elasticity and other interesting problems. We may very probably be on the eve of most important discoveries that may transform the manner of constructing structures of other materials, as well as of concrete.

Moulded Lumber. In the United States we find various ideas being worked out in many ways. In that country inventors are encouraged to develop every idea, however absurd it may appear at first sight. Ideas are not put on one side for want of consideration, or experiment, if necessary. Every possibility of working in concrete that may occur to anyone is tried. Novelties are not immediately discredited because they appear to be possibly inefficient, or do not show economy over ordinary methods. Thus when, as generally, exploited by enthusiastic inventors who manage, one by one, to overcome the difficulties, and it is discovered that what appeared to be an absurdity or an impossibility was, if modified and properly carried out, an eminently practical idea, and one that was distinctly advantageous as regards economy of time, material or labour.

One of the directions in which considerable efforts are being made to perfect the principle is in the construction of parts of construction by separately moulded pieces. Instead of executing the work *in situ*, reinforced concrete buildings of various kinds have been erected in which many of the members were moulded separately and put in place, very much as timber might be. As a rule, such construction has not been found to offer any advantage, except in the way of speed, over the methods of completely erecting a structure of centering and casting the concrete thereon. Such centering is, however, expensive, and it is possible by the use of moulds to do away with a large amount of it, and if only means could be found to design and erect the moulded pieces economically, there is undoubtedly a great future for the system.

Our readers will remember how Mr. Thos. Edison proposed to pour a concrete house within a metal mould. In this case, however, he would have had to erect the moulds first, which thus was practically the same as an ordinary wooden centering, although the moulds were more lasting.

Another system of building, however, which is already in full swing in the States seems to us to offer more chance of success than Mr. Edison's proposal. In this system the walls are cast flat upon the ground, and are then raised into position by a special form of screw-jack, consisting of a kind of tilting frame. The walls are then coupled together and the floors and roof affixed.

In another system, stanchions, joists, roof, principals and rafters, walls and tiles are all made up of moulded elements, which are assembled together very much as timber is. Though it would appear that timber was very much more economical yet concrete can, however, be cast, where there is plenty of repetition, very cheaply, and its lasting qualities and fire-resisting nature are, of course, infinitely superior to timber, so there is sometimes a saving effected even in house construction, if all these points are considered. The system at present appears to us to be too ingenious and too complicated to promise any real success in its present form, but no doubt in the course of time it will be much simplified as the results of practical experience. We now find that sleepers and fence posts are economically made of reinforced concrete, and, indeed, it is being used for all sorts of strange purposes, so that we must not be surprised if this method of construction with separately moulded concrete pieces becomes an economical method in the near future, and supplants in some part the moulding of work *in situ*.

Concrete Notes.

The concrete plant for storing, mixing, and transporting the materials for the construction of the Gatun locks of the Panama Canal has excited a great deal of interest on account of its unprecedented size and its many unusual features. The general design of construction plants for concrete work, even of large size, is so familiar to engineers interested in the subject, and the equipment commonly used for definite classes of work follows so closely to what may be termed standard lines, that the size of the equipment now in operation at Gatun is rather surprising. In the first place, the storage capacity advisable for the concrete materials was necessarily large, so that the work would not suffer by delays in the delivery of material, and the provisions for the storage of 200,000 cub. yds. of crushed rock, 100,000 cub. yds. of sand, and a maximum of 120,000 barrels of cement, are well within the requirements when considered in conjunction with the high yardage of concrete to be placed each day. Only a meagre acquaintance with construction work is necessary to appreciate the magnitude of these storage figures. Possibly, however, a figure that will appeal still more to practical men is the daily rate at which concrete will be deposited; a maximum rate of 2,220 cub. yds. in each 9-hour shift is expected in those parts of the work where only a little form work is required. These figures are so large that they must be compared with the daily rates usually attained on large dam and lock work in order to be appreciated. The total quantity of concrete to be placed is between 2,000,000 and 2,300,000 cub. yds., and this is to be distributed along a distance of about 3,900ft. Bearing these figures clearly in mind, the duties of the mechanical equipment are more readily comprehended, and the necessity for high speeds in cableway and electric railway operation is seen. The transportation of the mixed concrete along the lock, previous to delivery to the placing cableways, was in itself a problem of no small magnitude, and steam motive power, so commonly used for this service, has been laid aside, and a third-rail electric railway adopted instead. There are eight cableways, four duplex machines of 800-ft. span, carrying two-yard buckets at a maximum speed of 2,400ft. per minute, and depositing as much as 2,200 cub. yds. of concrete in 9 hours.

* * *

The effect of concrete in preventing the rusting of steel imbedded in it has been the subject of so much controversy that the light thrown on the matter by the electrolytic theory of corrosion is instructive. According to this theory, iron can pass into solution only when an equivalent amount of hydrogen passes from the ionic to the gaseous state, and if the hydrogen concentration is reduced the rusting of the iron will be diminished. This is achieved by adding a strong alkali to the water which is in contact with the steel. According to Dr. W. H. Walker, the caustic lime given off by Portland cement in setting and hardening has this action, and iron or steel imbedded in concrete will not rust so long as this caustic lime is present. Unfortunately it is soluble in water, and it is therefore desirable to make the concrete containing steel reinforcement very dense since by so doing the protective properties of the concrete will be maintained for the longest time. If the caustic lime is once dissolved out of the concrete, the metal will surely rust, according to Dr. Walker. This theory is completely in accord with experience, which has shown that dense concrete will protect steel, even when it was rusted before being embedded in the material, while in porous concrete steel will sometimes rust rapidly.

The late Mr. John Wornham Penfold, of Courts Hill, Haslemere, Surrey, architect and surveyor, for many years secretary to the Surveyors' Institution and surveyor to the Goldsmiths' Company, left estate of the value of £62,071 gross and £49,076 net. The testator left £500 to the Surveyors' Institution and £500 to their benevolent fund, £2,000 to Haslemere Cottage Hospital, £200 to the Royal Surrey Hospital, £150 to the Charitable Fund of the Surveyors' Club, £100 to the Benevolent Institution of the Royal Institution of British Architects.

REINFORCED CONCRETE.

By Arthur C. Auden.*

Reinforced concrete is *not* the "new thing," the "experiment," the "unknown quantity" which it is so frequently and erroneously described as being. Of course there are new forms and uses of it which we have not yet been able to test by time as to their durability, but these only represent phases of the development of the material as a whole and do not affect the main question of depreciation, upkeep, reliability, and similar important matters. It is a fact well known to all those who have studied this question, even superficially, that there were important structures in reinforced concrete erected in London in 1889, and which are still in use, and on the Continent can be seen equally large structures successfully built twenty-five years ago and also still in use without having been strengthened or "patched up." It may probably be said that the above instances, being buildings or houses, are not very conclusive evidence to engineers, as they would probably never be loaded up to even the safe loads for which they were designed, and the area of their foundation-plan is practically equal to that of the buildings themselves, and also that they are not subjected to much vibration. We will therefore take the case of bridges, which are subjected to great vibration and the foundation area of which is very much less than that of the whole structure, and we find that there are numerous instances of bridges in reinforced concrete built more than ten years ago which are still in as good, or better, condition than when first put up. I do not refer to narrow-span bridges or culverts, but to those of fair spans such as the Eslingen Bridge over the river Neckar with a 60ft. span, fourteen years old, and over the same river at Ybbs with 140ft. span, twelve years old, the Chatellerant Bridge, 153 ft. span, eleven years old, and the Prince Rupert Bridge at Munich with 191ft. span, and ten years old.

Materials.—An important point in connection with reinforced concrete frequently presents itself, namely, as to the nearest place where the materials, such as sand and gravel or chippings, can be obtained, and it is a question well worth close consideration because in nearly all instances the cost of the proposed structure will be of course affected by the cost of its constituents, and these are in turn much influenced by the cost of freight and carriage. From this particular standpoint it is proposed briefly to classify the materials, as it is by no means uncommon to find that, within reasonable limits, we can, by slightly altering our design, use cheaply-obtained aggregates without in any way materially affecting the use and efficiency of the proposed structure, provided of course that the said structure is not of an ornamental design and does not contain much fine work.

From the above standpoint, therefore, I will consider, first, the stone, that is, chippings or gravel.

In many places the Eastern Counties' flint is practically the only stone locally obtainable but though this makes good, tough concrete, it is unreliable for fire-resisting purposes owing to its tendency to crack and "fly" under heat. The proposing user must, therefore, balance his reduction in capital expenditure by a slight increase in his fire-risk. It is interesting, however, to know that this tendency to crack under heat can be much reduced by passing all the stones through a crusher, as practically all flints have their crystallisation definitely bounded by planes along which they always break, the remaining portions between such planes being comparatively homogeneous with but little tendency to "fly."

The same remarks apply to limestone, but it has not the redeeming feature of being more fire-resisting after being broken; in fact, it is not advisable to be used at all where fire-resistance is an important consideration, as it is very apt to disintegrate to powder under the action of heat, but it is not to be condemned entirely as it is quite a serviceable material apart from increased fire-risk. It must, however, be remembered that it almost always needs washing before use, as, after breaking, it will generally be found to be covered with fine, blunt dust which prevents the cement properly bonding with it; the expense of this washing must, therefore, be set against the cost of other slightly higher-priced stone which can be used as received.

Sandstone can be obtained in many parts of the country in almost unlimited quantities, but as a rule it is too soft, too porous and too absorbent for use in reinforced concrete work. Samples should always be taken and tested by crushing, and if it is found that it will stand about 1½ tons per square inch, and that the difference in weight, when clean and dry and after being two days under water, does not exceed 8 per cent., it may be safely used.

Quartzite stone is fairly good if not too soft and open in texture, in which case the same precautions apply as for sandstone.

With reference to testing for crushing strengths of either stone or concrete, it must be borne in mind that reliable results cannot be readily obtained by crushing small pieces, say of only about a square inch or so in area; it is always advisable to use larger test pieces, say such with an area of at least 10 or 12 square inches.

Speaking generally, broken bricks are not a good aggregate for reinforced concrete, although they have given excellent results in mass-concrete. They are usually too soft and yield too much blunt dust and have frequently old mortar adhering to them; if, however, they are hard and close in texture and free from mortar they may be safely used.

It is well known that coke-breeze makes an excellent class of concrete, but it must be remembered that such cannot be regarded as being really fire-proof, although some recent tests by the British Fire Prevention Committee, to which reference will be made later, show that this material can "hold its own" very well in this respect; but from its nature it is much less capable of resisting either tensional of compressive stresses than harder and tougher materials, and the question of sulphur is also present. It is, however, quite possible to design a structure in such a way that—omitting the question of the best fire-resistance—a large portion of it can be made with reinforced concrete composed of this usually cheap and readily-obtained aggregate.

There are very few manufacturers or mechanical engineers who do not make ashes and clinkers, and many have to pay to have them removed. It is, however, quite possible, with care, to obtain two decidedly serviceable forms of aggregate from these, one being the ashes, which are very similar to coke-breeze, and the other the hard-burnt clinker; but, as with all other materials except the real stone aggregates before-mentioned, discretion must be used in the selection of any which are derived from waste products, such as are now under consideration.

In the case of ashes, only those that will float in water and which are of a uniform colour and texture, and quite free from adhering pieces of coal and dirt, should be used, while with clinker only that which is really hard and clean is serviceable. In both cases if the washing and riddling or screening are carried out as one process, a more reliable result will be obtained. The question of sulphur must, however, be carefully watched.

Slag from furnaces, whether blast or cupola, makes also quite a good aggregate, provided it is hard and tough and free from dust and its sulphur contents carefully noted.

As is well known, all clinkers, breeze, slags, etc., contain a certain amount of sulphur, which is apt to attack the reinforcing steel with disastrous results. The maximum allowable percentage of sulphur in reinforced concrete aggregates is now being made the subject of tests and experiments—as in fact are all other details in connection with reinforced concrete—and it is to be hoped that an authoritative statement on this subject will shortly be issued, as it is of considerable importance to engineers, particularly to those who have slag heaps of any considerable size, but there is an important point in connection with the presence of sulphur, namely, that if it is in the form of "sulphate" it is practically harmless, but if in the form of "sulphide" it is very deleterious, and anything more than a very small amount indeed should not be allowed.

Care should also be taken with all artificial aggregates that no free lime is present; but, as in the case of sulphur, there are two forms of this material present, one of the free lime referred to which is dangerous and the other carbonate of lime which is practically harmless. It must be noted, however, that washing and exposure to the air and sun will do much to convert the dangerous sulphide into the comparatively harmless sulphate, and exactly the same is true with reference to the harmful free lime and its practically safe carbonate. Unfortunately, quite good and accessible aggregates containing lime or sulphur are sometimes condemned *en masse* because no discretion is exercised as to the form in which such occurs.

Mention has already been made of the washing and screening of aggregates, and it may be of interest to note that "jigging" is a much better method than throwing against an inclined sieve or screen; it has the advantage also of enabling the washing to be done simultaneously with the screening, and also—particularly in the case of the artificial aggregates—jigging knocks the weak corners off and produces better shaped pieces.

Sand.—Sand is, in some parts of the country more difficult to obtain than any other constituent of reinforced concrete. A certain amount is absolutely necessary, and nothing up to the present is known which really and entirely supplies its place. Engineers having foundries will have a ready means of judging sand for reinforced concrete if they remember that, generally speaking, the better sand is for moulding the worse it is for reinforced concrete. For instance, it must not "bind," that is, retain any shape when compressed, and it must be incapable of being smoothed with a trowel to a bright surface, or of "standing up" by itself when cut with a shovel; these being "rough and ready" methods of ascertaining that the sand has what is required, namely, large sharp grains. Dirt in the form of slime, mud, or vegetable refuse is distinctly bad, but a little loam, enough to soil the fingers when lightly rubbing the sand between them, but not enough to make the sand itself adhere to them, is no detriment. Small particles or nodules of clay do not appear to affect the strength of the concrete, provided they are very small both in themselves and in number, but they are not an advisable ingredient and should be avoided if possible, unless there is ample time to mature and test sample pieces of concrete made with the sand containing them.

If sand is scarce or costly, some economy may be effected by regarding the very small pieces of the stone or other aggregate, below ⅛in. mesh, as sand, and mixing them with some real sand. The economy is not so apparent as appears at first because the small pieces must be screened out from the larger aggregate, and in most instances washed to remove the floury dust before being mixed with the real sand, ready for putting in the gauge boxes. It is not good practice to use the stone aggregate and its smalls and dust and some sand upon the chance that they will be in the proper proportions and that the voids and spaces will be properly filled. Experience has shown that this is usually not the case, and although this frequently is the practice with mass-concrete it should not be allowed in reinforced work where absolute homogeneity is so essential.

Cement.—With reference to cement there is nothing to remark, as most excellent descriptions of this material are obtainable anywhere, but it should not be one of the many mixtures imported into this country as *cement*, which do not deserve the name and are costly at any price. Any user is safe if he insists that his cement shall pass the British standard specification in every detail, and that it is purchased from a reliable manufacturer.

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* Part of a paper read at the Liverpool meeting of the Institution of Mechanical Engineers.

(*To be continued.*)

CONCRETE PILES.

Reinforced concrete piles are now largely used for foundations in all sorts of structures and in many situations.. There is very little difference between the reinforced concrete pile foundation and the timber pile foundation. In general principle it is the same. The piles are driven in rows or clusters and capped with a platform of concrete on which the superstructure is erected in the customary manner.

In comparison with timber piles, reinforced concrete piles have several advantages and few disadvantages. They are equally durable in wet or dry soil, whereas timber piles must be constantly under water to have any life, and then often they are open to the ravages of the toredo or the limnoria—the marine borers—which make their life very short. In waters which are much infected an untreated timber pile may not last eight months, while a creosoted pile, even, may only last a few years. Timber piles are very frequently injured in driving, and it is surprising when they are exposed in subsequent excavation work as sometimes happens what a large proportion of piles are found to have been injured in the driving. Sometimes they are telescoped and sometimes the points turned up. Indeed, instances have occurred where timber piles have turned up in the driving, and the points made their appearance on the surface again. Now the reinforced concrete pile cannot be injured by hard driving, all that has ever occurred when attempts have been made to so injure them is for a short length at the bottom or top to be shattered, but the intermediate portion is always found perfect. Reinforced concrete piles are often drawn and redriven several times without any injury. It is difficult to secure long timbers for piles that will conform to the specifications in point, etc., whereas the concrete pile can be moulded perfectly to the dimensions and form desired, and proportioned to the load it is intended to support.

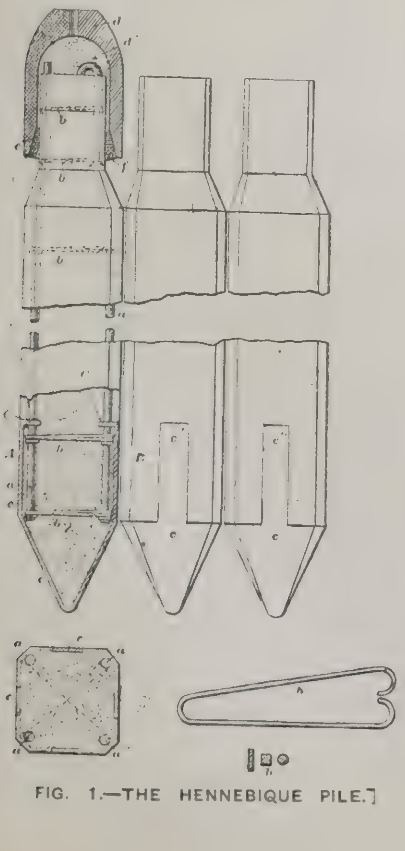


FIG. 1.—THE HENNEBIQUE PILE.

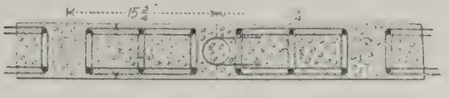


FIG. 2.—HENNEBIQUE SHEET PILING.

As regards first cost that is a matter in which reinforced concrete piles may be considered to be at a disadvantage, for such piles are generally more expensive than timber piles, though the position may be reversed in certain localities where the cost of timber is high. In this country there is not a great difference in cost. Other disadvantages are that reinforced concrete piles are more troublesome to drive than timber piles, and that they are heavier. To a great extent the first objection has been met by the employment of special pile drivers, while the second by making provision for lifting by special tackle. Even supposing the cost of reinforced concrete piles to be more than timber piles, there are other directions in which the cost is to a great extent set off by other savings. For instance, as the timber piles rot out of the water, it has been the custom to saw them off at low-water level and to erect piers from this point. This means that not only is there the trouble of cutting off the ends of the piles, but the depth of excavation and the quantity of superstructure must be increased.

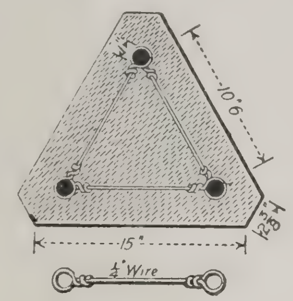


FIG. 3.—REINFORCED CONCRETE PILE USED FOR FOUNDATIONS OF A COURT HOUSE, BERLIN.

There are two main types of concrete piles on the market, one consisting of the reinforced concrete pile that is moulded in place and driven in a similar manner to a timber pile, and the other a pile formed of plain or reinforced moulded in place by pouring concrete down a hollow cylinder that is first driven in to the ground and afterwards withdrawn.

Reinforced concrete piles are very similar to columns, their construction consisting of vertical rods with horizontal ties. They have to be subjected, however, not only to the load acting centrally upon them in the same way as columns, but to sheer stresses induced by forces applied laterally and to vibratory stresses due to the driving, and to perhaps bending stresses due to their being lifted into position, the latter being of minor importance. The driving may be effected by means of blows upon their tops or by means of a water jet, which washes away the soil under their points. Sometimes the two methods are employed in conjunction. The water jetted pile is allied to the dropped pile; it sinks by its own weight, and does not need driving. Circular-pointed piles are perhaps best for penetrating in hard soils, but in softer soils the pyramid point is better.

There are various forms of reinforced concrete piles that have been invented and used. Fig. 1 shows the Hennebique pile, the general form of which consists of four rods placed at the corners of a square pile with wire ties between and a shoe attached to the ends, the whole being embedded in concrete, which is moulded either vertically or horizontally, though the latter method is usually favoured. The top of the Hennebique pile is circular, this being for the purpose of taking an iron cap packed with sand. In addition to this cap a timber dolly is employed to reduce the shattering effect of the blow upon the head of the pile. M. Hennebique's piles have been constructed with a circular hole moulded lengthwise down the pile, through which water can be forced by a jet, and finally for forcing grout out into the soil surrounding the point when it has penetrated as far as necessary.

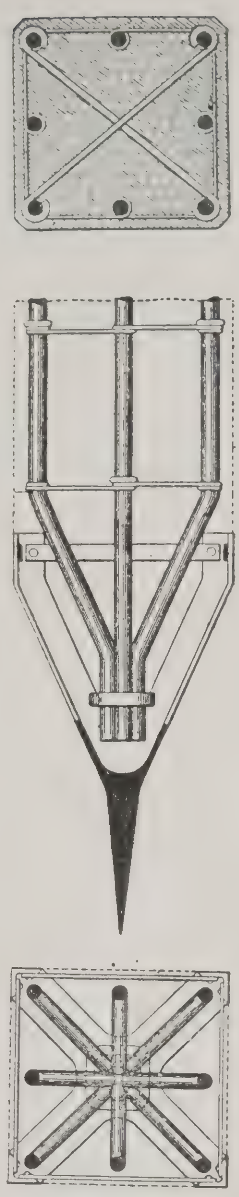


FIG. 4.—REINFORCED CONCRETE PILE USED FOR A WHARF, AT NOVOROSSISK, RUSSIA.

Hennebique sheet piles have also been constructed (as shown in Fig. 2) consisting of a rectangular slab with a steel-shod point formed by levelling one of the narrow faces so as to form a wedge edge with the opposite face. The reinforcement consists of six bars arranged along the broad faces, and tied together in the same way as in the square piles by loops of wire. A sort of tenon, formed of a strap-iron staple, was employed in the particular design here illustrated, so as to keep the piles in alignment while being driven. This staple also served to hold the nozzle in driving by water jet. The circular hole formed by the adjoining grooves was filled with concrete after the driving had been completed, and thus the piles were welded into what was practically a monolithic sheeting. A pile of a novel form is illustrated in Fig. 3. This, it will be seen, is triangular. It was used in the foundations of a court house in Berlin. The sides of the points were bevelled to form a point.

The reinforcements consisted of 1in. round rods at the corner, tied together with ¾in. wire ties at 8in. intervals. The rods converged together at the points and were welded together. The mixture of concrete employed in these piles was 1 part Portland cement with 3 parts river gravel.

Fig. 4 shows a form of pile that has been employed at Novorossisk, Russia. These piles were 15¾ins. square, and each carried a load of 85,584lbs. Their total weight per lineal foot was about 262lbs., of which the reinforcement constituted about 451lbs.

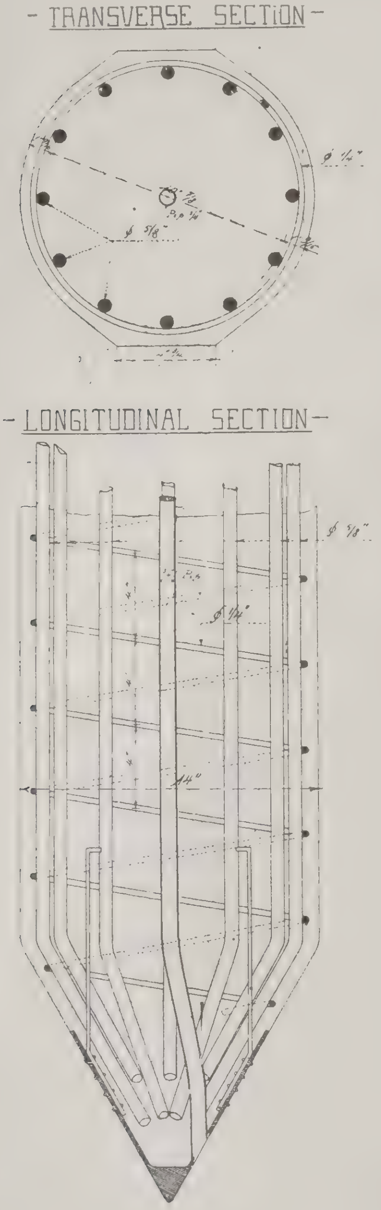


FIG. 5.—THE COIGNET PILE.

The Coignet pile (Fig. 5) has a larger number of longitudinal bars, with a rod spirally round them.

The Considère pile (Fig. 6) has also a large number of longitudinal reinforcements with spiral winding, but the former are smaller in section, while the latter is of larger section than the building of the Coignet pile.

A hexagonal hollow pile has also been designed by Signor Albertini, of Modena, in Italy, the purpose being to secure a light and strong pile, easy of transport and capable of being bonded with the superstructure by inserting rods in the hollow core and filling up with concrete.

A hollow pile of Hennebique manufacture, the invention of the late Mr. L. G. Mouchel, who was the first agent for the Hennebique system in this country, has also been used. Terra cotta tubes are here used and concreted in the pile.

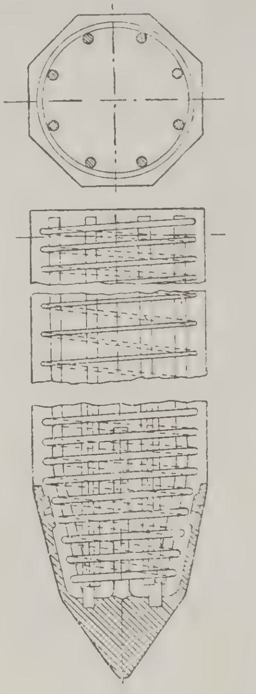


FIG. 6.—THE CONSIDERE PILE.

The Gilbreth, an American form of pile, is tapered and corrugated, and has a hole its full length through which a 2in. water jet pipe is passed while driving.

The Cummings is another American pile, octagonal in cross section, the longitudinal reinforcement of which is made of steel angles. The shoe is of malleable iron, riveted to the reinforcement.

Fig. 7 shows a peculiar form of sheet pile, in which the reinforcement consists of steel joists. One of the narrow faces has a groove and the other has a tongue to provide for the interlocking of the adjacent piles when they are driven as sheeting. These piles were used in a quay wall, and the anchor rod which is shown in the view was carried back in the filling of the quay and fastened to a massive concrete anchor.

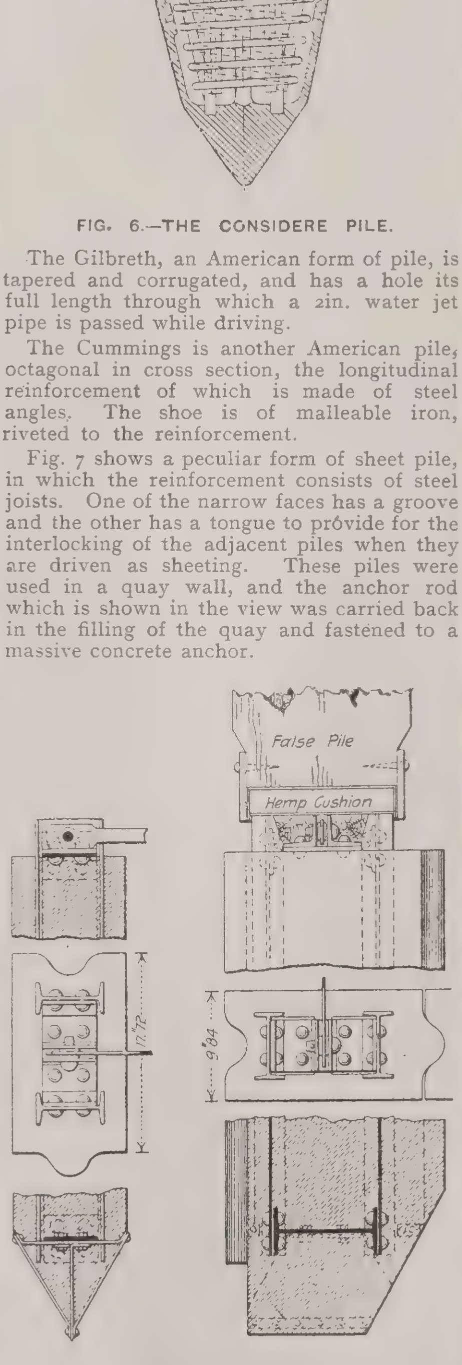


FIG. 7.—SHEET PILE WITH I-BEAM REINFORCEMENT.

Fig. 8 shows the Williams pile, which has a joist embedded at the centre, which is forged to the end to form the point; wire or hoop-iron ties are also provided to strengthen the concrete.

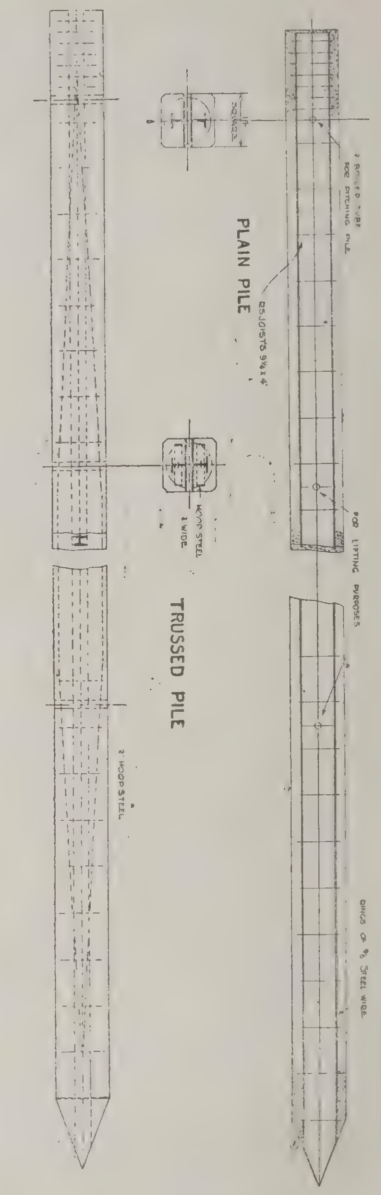


FIG. 8.—THE WILLIAMS PILE.

Some extensive pile foundations for a quay wall in a wharf were constructed at Southampton in 1898 by the Hennebique company. The piles in this quay wall were spaced 3ft. 7ins. apart longitudinally, and were 12ins. by 12ins. The bearing piles of the front, which were filled between with reinforced concrete sheet piles, each 12ins. by 12ins., were reinforced by 1⅛in. round rods connected by 3-16in. ties. The wharf 12in. by 12in. piles were spaced about 10ft. apart in both directions, and the wharf was designed for a load of 375lbs. per sq. ft.; each pile, therefore, sustained a load of about 570lbs. Four reinforcing bars, tied together at intervals, were used in each pile. The construction of the quay wall and wharf are shown in Figs. 9 and 10.

Reinforced concrete piles are cast either vertically or horizontally. It has been supposed by some that it is desirable to cast them in the former fashion, because that is the position they will occupy in the work. It has been found, however, that quite as good results can be obtained by moulding the piles horizontally, which method is much more convenient from a practical point of view, as it is more economical; indeed, it seems proved that a pile can be moulded much better in this position because the material can be punned better. The planes of the layers in which the concrete is moulded are, of course, vertical in the one case, and horizontal in the other, so that they therefore thus cross or are parallel to the direction of the pressure. Convenience in moulding horizontally seems to off-set any advantage

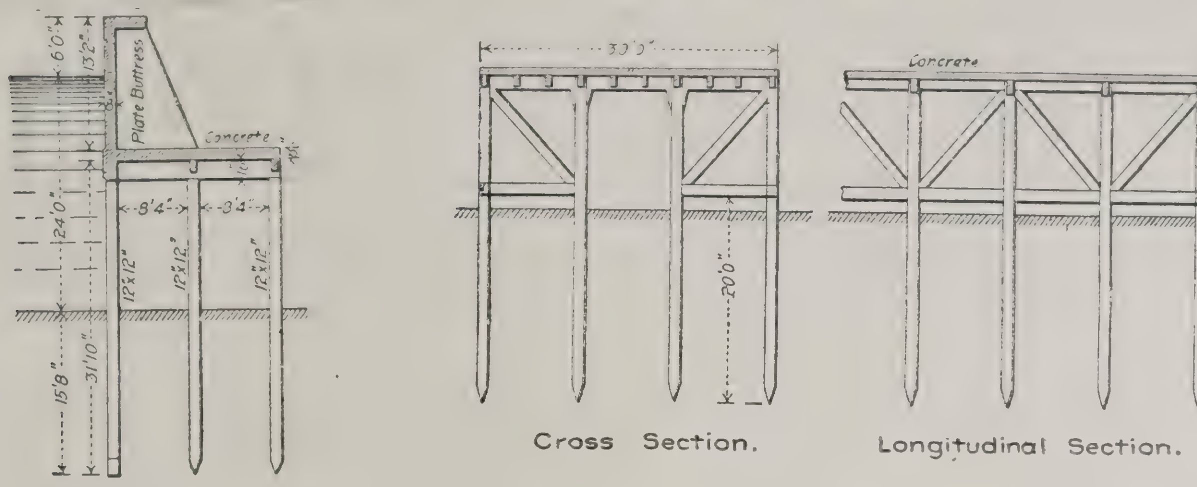


FIG. 9 AND 10.—REINFORCED CONCRETE QUAY WALL ON REINFORCED CONCRETE PILES, SOUTHAMPTON..

in this respect of the vertical method of moulding. The forms or boxings employed in moulding piles are similar to those used for constructing columns and beams. The piles can be removed from the forms in one or two days, but they are not sufficiently hard to be driven for at least thirty days.

Reinforced concrete piles can be driven by hammer pile drivers or by water jet, or in any other manner in which timber piles are driven. In driving by a ram, the fall of the ram is usually decreased, and some form of driving cap is provided to distribute the impact stress evenly over the top of the pile. The weight of the ram on the other hand is usually considerably increased. 16in. square piles of Hennebique construction used for a bridge in Alsace Lorraine were driven with a four-ton ram with a maximum drop of eight feet, which would decrease as the penetration decreased. Hennebique piles, 12ins. square, are frequently driven by a 30cwt. hammer, with a drop of 4ft. In driving sheet piling of 11.8in. by 14.8in. in cross-section, at Chantenay-sur-Loire, in 1898, a ram weighing 3,520 pounds, and having a drop of 6.25ft., was employed. The pile used in Russia, to which reference is made above, was driven 2ft. into a hard bottom, with from 10 to 14 blows with a 3,375lb. ram. Except that stronger tackle is required to handle the heavy reinforced concrete pile, the ordinary pile driving rig for driving timber piles is all that is essential.

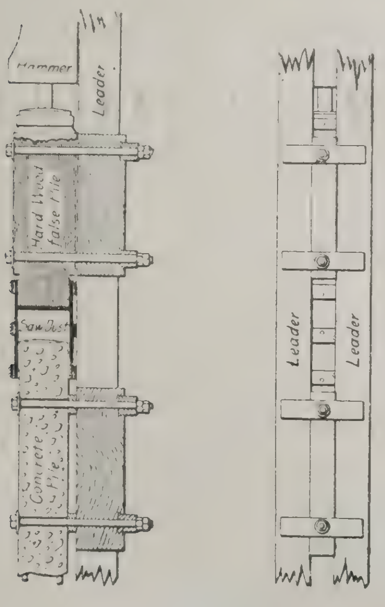


FIG. 11.—FALSE PILE AND DRIVING CAP EMPLOYED AT CHANTENEY-SUR-LOIRE,

Fig. 1 shows the cast steel helmet devised and employed by M. Hennebique for driving his piles. It fits over the neck of the pile loosely, and the annular opening at its lower edge is covered with clay and tow, and the hollow space above is filled through a hole in the top with sand, or preferably with sawdust. A separate cap is required for each size of pile. In driving most of the Hennebique piles at Southampton a timber dolly was also used in addition to the metal cap.

Fig. 11 shows a more complicated arrangement employed in driving the sheet piling at Chantenay-sur-Loire in France. Here the piles were cast with reinforced tops, which were desired to be shattered sufficiently in driving to expose the reinforcement. These allowed the top of the pile to be clamped loosely to the guides of the pile-driver as shown. A metal cap with a lower and upper socket was set upon the neck of the pile with a filling of sawdust over the top of the pile, and its upper end received a hard wood dolly clamped in the pile driver guides as shown.

In driving the triangular piles above referred to, a cap was used made of alternate layers of iron plate, wood, and lead. This cap was clamped at the head of the pile, and also served to guide it.

Another device used consists of a metal cap similar to that shown in Fig. 12, but having the socket on top, in which there is a piece of hard wood interposed between the pole and the dolly to take the direct blow of the hammer.

As regards driving by means of a water jet (the arrangement for which is usually as shown in Fig. 13), we may refer to the construction of the River Aisne bridge at Soissons, in France. Both the sheet piles and the bearing piles were of Hennebique construction. Some of the pier piles were 9.8ins. square, and 11.8ins. All the sheet piles were 5.9ins. by 13.8ins. in cross section. The material penetrated was sand mixed with a few pebbles. An attempt was made at first to drive some of the 9.8in. square piles with ram drivers, using a driving cap and dolly, as shown in Fig. 243, p. 347, Buel, with a 1,320lb. hammer. The first pile driven reached a depth of 8.2ft., but its head was completely shattered for about 1.97ft. The second pile had its head shattered at the first blow, and by the time it had reached a depth of 3.28ft. the metal was bare for a length of 2.29ft. Owing to this poor success with driving by means of a ram, the engineer substituted a water-jet apparatus. The engineer in charge of the work attributed the failure of the ram driving to the piles being of insufficient age, being only 1½ months old, and also to the fact that they were moulded on their sides instead of vertically. In driving the remaining piles use was made of a hand pump, which, however, gave a pressure too low to loosen the material sufficiently. The mode of procedure was to operate the pump until the earth under the point of the pile was loosened, and then to give the pile a few light blows with a hammer to set it into the loosened soil. This process was repeated until the piles had penetrated a distance of from 8.2ft. to 9.8ft. Six days were required to drive 18 piles. In placing the piles in the two piers, power pumps were substituted. To guide the piles a timber frame was used, as shown in Fig. 14. A panel of eight or ten piles was erected in the guides and driven, and then another panel, and so on, these piles being employed in a coffer dam.

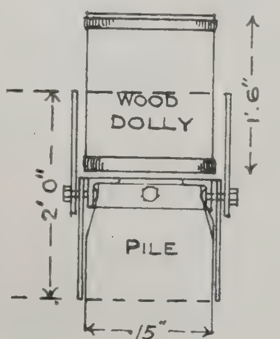


FIG. 12.—COIGNET CAP FOR DRIVING

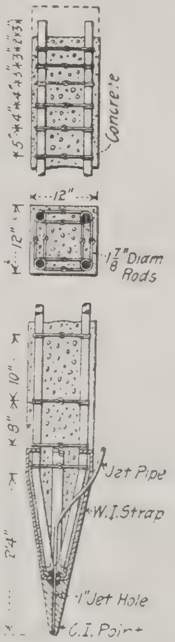


FIG. 13.—ARRANGEMENT FOR DRIVING BY MEANS OF A WATER JET.

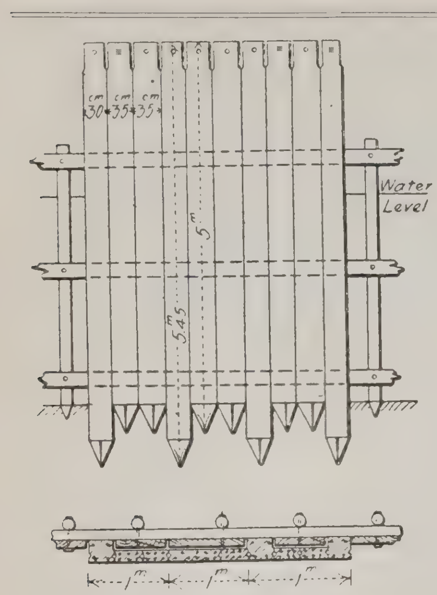


FIG. 14.—TIMBER FRAME FOR GUIDING PILES.

Steam pumps supplied the jet which was delivered against the soil by an armoured hose, terminating in a iron tube 1.38ins. in diameter, and 22.96ft. long. This tube or nozzle was manipulated by a workman, so as to deliver a jet underneath the point of one pile at a time. The pile was forced down by a lever over its head. With a gang of six men a panel of five or six piles could be sunk 3.82ft. in one hour. In one instance 45 piles were driven in a day's work.

(To be continued.)

In Parliament.

By our Gallery Representative.

Tenders for Egyptian Railway Buildings.

In the House of Commons last week, Mr. Staveley-Hill asked the Secretary of State for Foreign Affairs whether his attention had been called to the complaint of English manufacturers that samples supplied with the tenders for the supply of ironmongery for buildings and furniture for the Egyptian State railways were of French manufacture and consequently offered difficulties for English manufacturers to work to; and whether he could suggest to the Egyptian Government a method by which English manufacturers should no longer be under any disability in tendering.

Sir Edward Grey, in reply, said he had not heard of the complaint to which Mr. Staveley-Hill alluded, but if he could give him further information he would inquire into the matter.

The Studio on Primrose Hill.

Sir William Collins asked the First Commissioner of Works if he could now name a date when the work proceeding in the studio of Mr. Brock, on Primrose Hill, would be completed and the area railed off from the hill be restored to the use of the public.

Mr. Harcourt said he regretted that he was not yet able to fix a final date for the completion of Mr. Brock's work.

Scottish Museum Expenditure.

Mr. Munro Ferguson called the attention of the Lord Advocate to the published annual reports of the Director of the Scottish Museum and to a recent official return from which it appears that during the period of 10 years ended March 31st, 1908, the sum of only £1,274 was expended in Scotland on the purchase of sites, erection of buildings, and extension of existing buildings, while in the same period £550,597 was expended for similar purposes on the London museums. He asked whether any steps were being taken to provide the increase of accommodation required by the Royal Scottish Museum.

The Lord Advocate promised that the question would be considered when the estimates for 1910-11 were being settled.

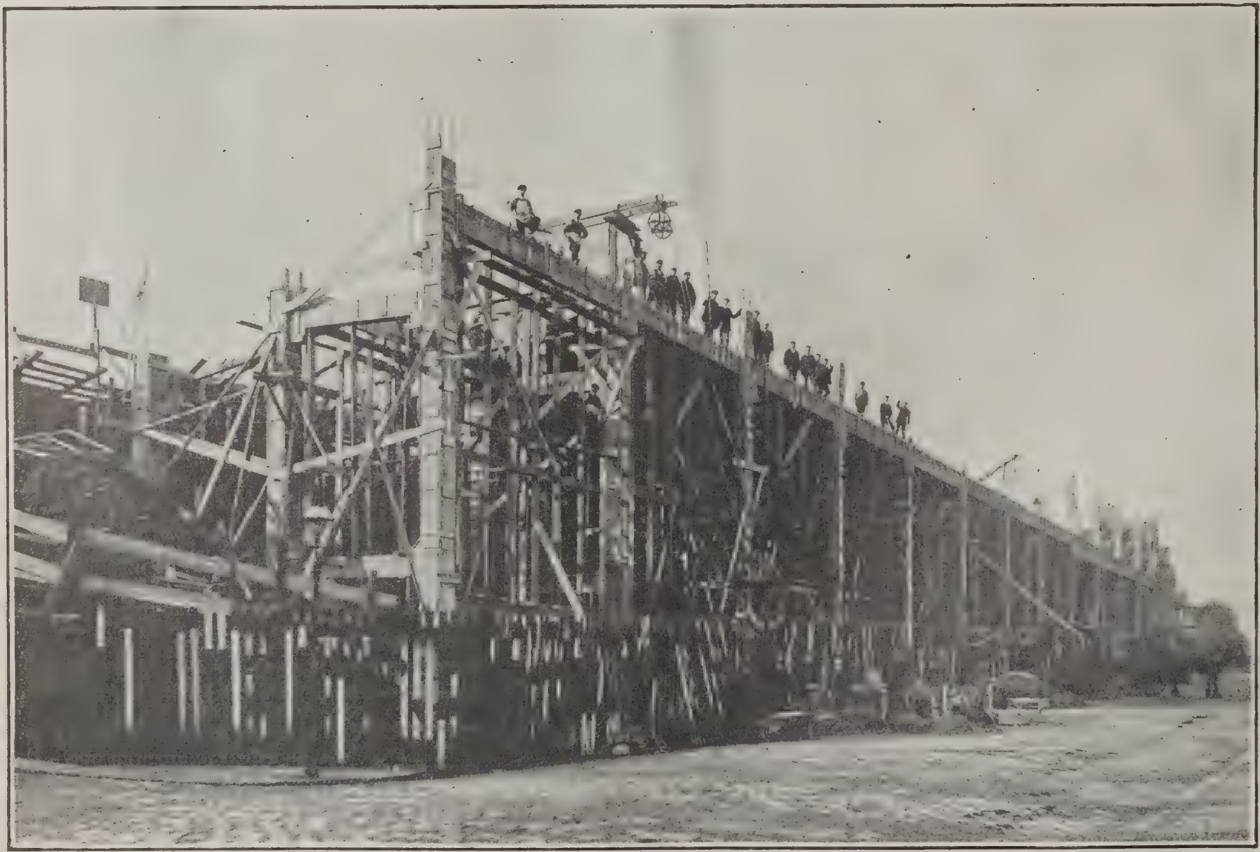
Duke of York's School.

Mr. Horniman asked the Secretary to the Treasury whether, in view of the recent removal of the Duke of York's School from Chelsea, the Treasury had considered the question of the sale of the freehold of the site; whether the advantage of retaining the said freehold, while letting the same on a building lease, had been duly considered, so that the unearned increment thereon might continue to revert to the Treasury; and whether any conditions as to the laying out of the site and the preservation of a portion as a garden for the public use were proposed to be annexed to such lease or deed of sale.

Mr. Hobhouse, in a printed reply, stated that the matter was under consideration.

Fair Wages Clause and Post Office Contracts.

Mr. Sydney Buxton, Postmaster-General, informed Mr. James O'Connor that in all contracts into which he entered for the alteration or repair of post office premises the fair wage clause was inserted. Careful investigation was made into any alleged breach of the clause.



BRADFORD FOOTBALL STAND.

This structure, one of the many instances in which reinforced concrete takes precedence by reason of its durability and the absence of expense in painting, etc., has been constructed with Kahn Reinforcement.

PRACTICAL CONCRETING.

(*Continued from p. 75, No. 755.*)

Tamping.

There is much difference of opinion, especially amongst engineers, as to the consistency of concrete. Some advocate the use of abundant water, others but just enough to obtain cohesion. When the concrete can be tamped or compressed, undoubtedly a moderate amount only should be employed; but if neither is practicable, except to a very limited extent—as for walls and floors—a more sloppy or pulpy state is essential, otherwise the concrete cannot be rendered homogeneous by reason of its dryness and stickiness, and consequent inaptitude of its particles to fill every crevice and interstice of the mass.

Setting.

Experiments made by the United States Government officials proved that "sloppy" concrete became much harder eventually than when only just water enough was added to create adhesion, but it took longer to acquire hardness. An advantage of well-saturated concrete is that it does not require so much tamping or beating, and in some cases none at all.

Chemical Action.

It is a peculiarity of Portland cement that it will not readily take up more water than is necessary for mixing, either with sand for mortar or with an aggregate for concrete, and if an excess is added the cement will part with it if opportunity offers. This is a curious property of cement; if it applies to lime it prevails in a much less degree, but there is no mistaking it in cement; if we could see the bottom of concrete after it had been trodden or rammed for foundations, we should find clear water, and on the top a sheet of writing paper could be saturated therewith and not soiled; in a short space of time the effluent water disperses itself in the minute cavities of the concrete. No positive harm arises from this effluent water that is known of, as its dispersal is gradual and gentle, and the cement having acquired an initial set is not disturbed thereby, but it plainly indicates that, although sufficient water is needed an excess is unnecessary. Perhaps more care is essential in this respect when the artificial foundations rest on a bed of clay or other non-absorbent material. If an unreasonable amount of water is used, the effluent water, instead of dispersing or throwing itself off, is in sufficient force to take with it a portion of the cement, and a serious weakening of the material ensues. In the case of concrete foundations this depletion results in pure cement being carried to the bottom thereof, and in walls or floors, wherever it may most readily find means of escape. If tricklings of cement are seen on the supporting boards of floors, or the encasing panels of concrete walls, it is direct evidence that too much water has been employed.

Depositing.

Prior to depositing, if the work is to be in trenches, the clerk of works is bound to see that the excavations are of the correct width and depth, and that a sufficiently good and level bottom is obtained, and that the trenches are free from water, mud, etc. If the trenches have been got out too wide, the extra width must be made up with concrete, and in no case must the proper width be kept by boarding, to be taken away as the concreting proceeds, nor must the void be filled with returned earth. If the concrete is to be deposited inside moulds, sheeting, etc., these must be inspected to see that no shavings, dirt, dust, or blocks of wood, etc., have been left in the same, which would occupy space that should be filled with concrete.

Experience has shown that no advantage is obtained by tipping concrete from a height to the level it is to occupy; at one time it was thought to consolidate the concrete mass.

The following further points are of importance in the uses of cement for concrete.

Cement Setting Properties.

The manufacturer has it in his power to make either quick-setting or slow-setting cement.

Slow-setting cement is that which sets after two or more hours, and is preferable to quick-setting cement for general work. Only for special purposes can a quick-setting cement be used advantageously.

In all cases the contractor should notify the manufacturer whether quick or slow-setting cement is required. This will obviate many unjustifiable complaints. But, first of all, it must be understood perfectly that the setting time asked for is actually required for the class of work to be carried out—he should not, for instance, order a quick-setting cement for grouting, and a slow-setting cement for pipe jointing!

Portland cement is of all cements the least sensitive to changes of temperature. Only during the process of setting can any injurious effect take place, and frost is then especially dangerous if the mortar is too wet.

In operations under water a quick-setting cement is preferable. In plaster work, cornices, etc., and when working in cold weather a cement should be used that is not too slow setting. In all other cases it is most advantageous to use a slow-setting cement.

Setting and Temperature.

Concrete sets more rapidly in hot water than in cold, and in the sun than in the shade. This is partly owing to the temperature of the water employed for mixing. It is unwise to attempt to make concrete with the thermometer below freezing point; in fact, some engineers state that concrete should not be made or employed when the temperature of the air on the ground is below 40 degrees or above 90 degrees, and that the temperature of water used for mixing concrete should not be less than 40 degrees. Very hot weather is unsuitable for concrete work, especially if it is exposed to the sun. The more asorbent and the drier the aggregate, the sooner the initial set commences.

Tamping.

The amount of force required in the tamping and the number and duration of the blows must depend on the size of the blocks to be made, and on the coarseness of the product. If insufficient force is used the material will not be as homogeneous as it should be, and internal strains will be produced which may prove serious later. Particular care should be taken that at first blocks of excessive depth are not attempted. These are exceedingly difficult to tamp effectively, and are a constant source of annoyance. The concrete maker, in his ignorance, lays most of the blame on the cement, changes his brand frequently and makes himself generally objectionable, whereas a little more friendly and tactful sympathy on the part of the cement maker to whom complaint is made would ensure the removal of this impression. Such detail as the tamping of concrete in constructional work is often thought to be beneath the notice of the average cement consumer, but he will find it of advantage to pay special attention to the point.

Cement Floors.

To construct durable floors of concrete the subsoil should be prepared in the following manner:—

For cement floors in the open, with great variations in the soil, after excavating to the necessary depth, a layer of coarse gravel or of ashes at least 18 inches deep should be made, levelled and rammed down. This serves to isolate the concrete and to draw off any moisture.

In places under cover, with a dry subsoil, it is sufficient to level and ram the subsoil down thoroughly.

The flooring should be in two layers, one of concrete, from 6 to 10 inches in thickness, which must be thoroughly tamped down, and an upper one made of a rich mortar about 1½ inches thick.

The mixture of the concrete for the bottom course may be made in one part cement, three parts sand, and five parts broken stone.

The upper layer is applied before the concrete has set, and is prepared by mixing one part of Portland cement with one part of sand. Before applying the top layer the concrete should be cleaned and roughened.

When the work is finished the surface should be carefully covered over and kept moist. In this way hair cracks may be obviated. If this necessary precaution is not taken cracks may occur, especially in the case of very large surfaces.

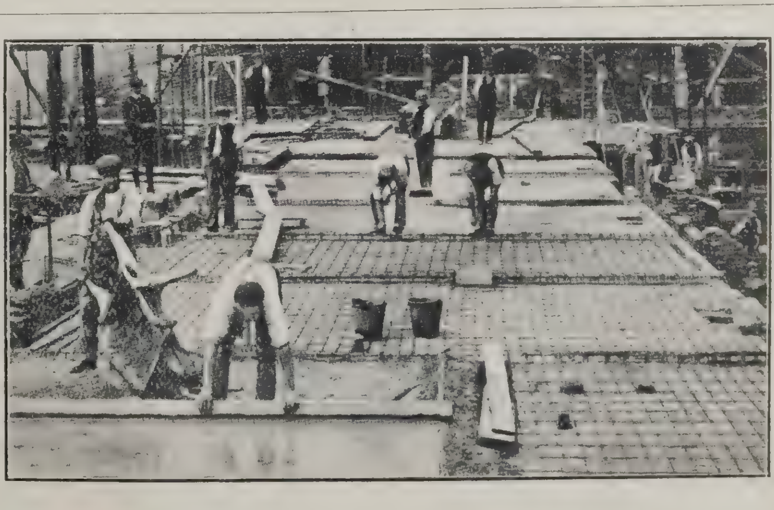
General.

To obtain the best results great care must be taken in the preparation of the mortar. Pure Portland cement may be used as mortar where the work remains permanently under water or in wet ground, or in enclosed spaces. Otherwise Portland cement must be mixed with a greater or less quantity of sand.

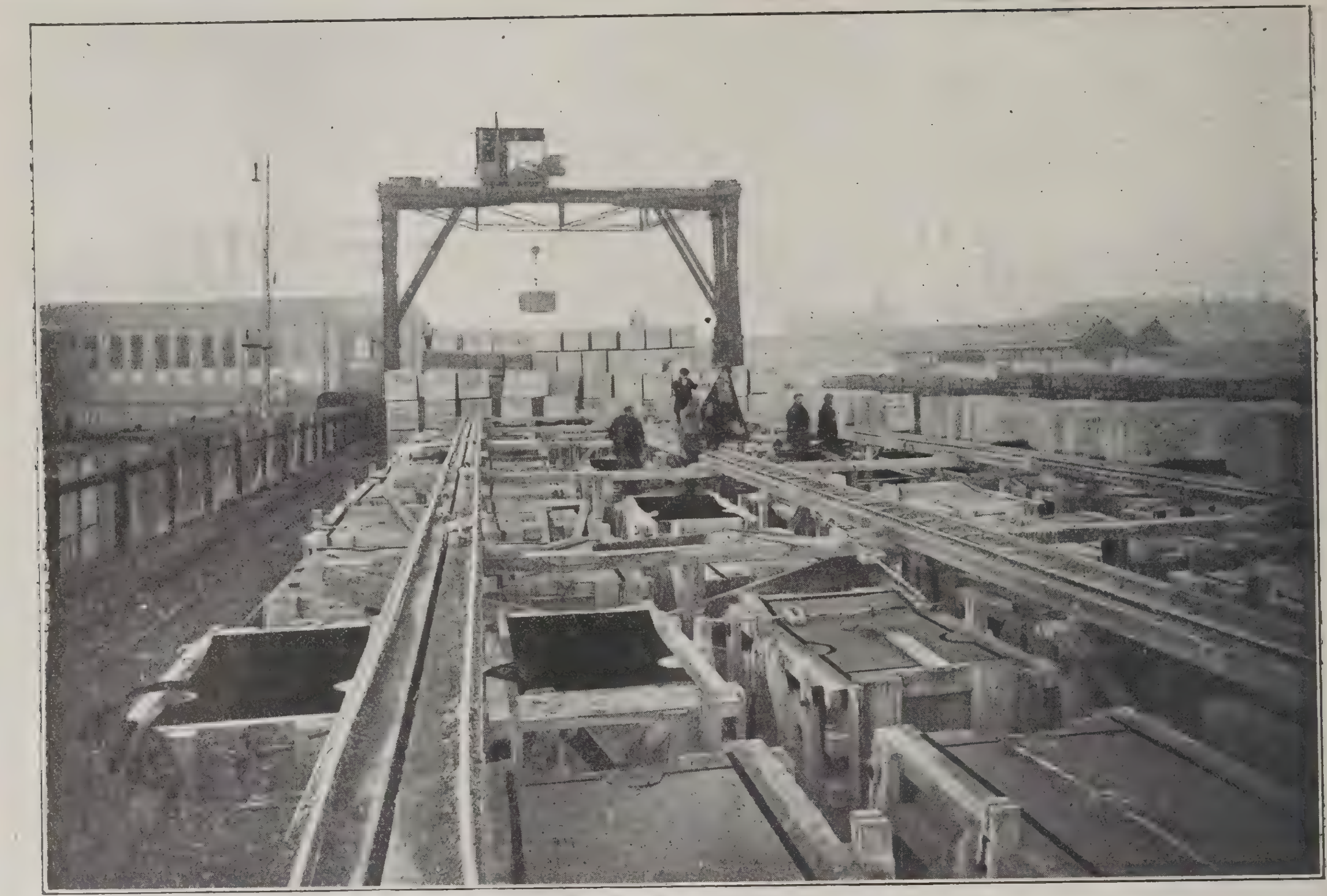
The quality of the sand, gravel and stone, has a great influence upon the hardness and strength of the work when finished.

Sand used must be coarse, clean, sharp and free from loam. The quantity of sand mixed with the cement is determined by the character of the work to be undertaken. One or two parts (by volume) of sand to one part (by volume) of cement is only employed when extrordinary hardness, great durability and water-tightness are desired. Three parts of sand to one part of cement is used for ordinary masonry.

The broken stone employed in concrete must not be inferior in point of hardness to the cement mortar used, therefore it is preferable to use granite, gravel, or hard limestone. The use of sandstone, brick-bats, and generally any porous stone should be avoided if the concrete is to be exposed to the influence of frost.



REINFORCED CONCRETE FLOOR AT THE WOMEN'S HOSTEL, BIRMINGHAM.
BUCKLAND AND HAYWOOD-FARMER, ARCHITECTS.
(Coignet Reinforcement.)



MAKING CONCRETE BLOCKS FOR THE NEW SOUTHAMPTON DOCK. *Photo: Topical.*

The view shows the extensive plant laid down for the manufacture of concrete blocks by the Contractors, Topham, Jones and Railton.

The pieces of broken stone or gravel should not exceed the size of a hen's egg.

In the case of good Portland cement, competent engineers suggest that the composition of concrete should consist of one part of cement, three parts of sand, with as much as five parts of broken stone.

The use to which it is proposed to put concrete should determine the quantity of sand and stone to be added to the cement.

Mix the sand and cement thoroughly before adding stone.

Add the stone to the mixture of sand and cement, and thoroughly mix these materials before water is added. Then add the necessary quantity of water and mix the whole mass again very thoroughly. Use immediately.

Clean water should be used in making mortar.

Do not change the proportions of cement, sand, and stone after the proper quantity of each has been decided upon, if a satisfactory piece of work is desired.

Great importance attaches to the careful tamping of concrete until water appears upon the surface, as it is only well tamped concrete that possesses great density and hardness.

The addition of water to the mortar is to be increased or diminished according to the requirements of the cement.

General practice requires the cement to be mixed with as little water as possible, and the mortar to be brought to the proper consistency by a prolonged and vigorous mixing.

Cement mortar is made by first spreading out the sand that has been measured, then the necessary amount of cement is spread over it and the mass stirred together until a uniform mixture is obtained; finally the necessary quantity of water is added and the mortar thoroughly worked.

It is important that the stone and brick, prior to being used, should be thoroughly wet.

Mortar that has set should be thrown away and on no account be retempered for use. It possesses no hardening properties and is therefore worthless.

The Special Commission on Concrete Aggregates, appointed by the British Fire Prevention Committee, have now prepared a provisional specification for concrete aggregates, which it would be well for all concretors to bear in mind, viz.:—

Artificial Materials for Aggregates.

1. Coke Breeze.—Coke breeze for use as a concrete aggregate shall be entirely coke taken from the gas retort, coke oven, or special furnace. It shall be absolutely free from clinker, coal, and all substances that will not float in water, and from any admixture of material taken from the retort furnace or water-pan below it, and from cinder, ash, or other admixture. The proportion of sulphur in coke breeze shall not be more than.........per cent.

Note.—It was decided that the determination of the allowable amount of sulphur should be the subject of future consideration.

2. Clinker.—Clinker for use as a concrete aggregate shall be the thoroughly burnt and hard waste product of furnaces, free from dust, shale, or free lime, and not having more than.........per cent. of sulphur.

Note.—Pan breeze is included in this definition.

Note.—In this case, as in that of coke breeze, it was decided that the determination of the allowable amount of sulphur should be the subject of further consideration.

3. Blast Furnace Slag.—Blast furnace slag for use as a concrete aggregate to be obtained and selected from pig iron smelting furnaces (to the exclusion of basic slag), to be of porous quality, to be washed to remove dust and sulphur, to be without free lime, and not to contain more than......... per cent. of sulphur.

Note.—In this case also it was decided that the allowable amount of sulphur should be the subject of further consideration.

4. Broken Brick.—Broken brick for use as a concrete aggregate shall be from well-burnt and perfectly sound and hard clay bricks, such as London stock bricks, or bricks of equal quality, and shall be of the size specified and be free from old mortar, and from dust or particles that will pass through a sieve of ⅛-in. mesh.

5. (a) Gault Clay Burnt.—Burnt gault clay for use as a concrete aggregate shall be free from free lime and sulphur and from unburnt particles, and shall be thoroughly hard, so that pieces soaked in water for ....hours shall not disintegrate.

Note.—It was decided that the Tests Sub-Committee should be asked to determine the length of time to be inserted in the clause.

5. (b) Ordinary Burnt Clay Ballast.—Ordinary burnt clay ballast for use as a concrete aggregate shall be free from free lime and sulphur and from unburnt particles, and shall be thoroughly hard, so that pieces soaked in water for.........hours shall not disintegrate.

Note.—It was decided that the Tests Sub-Committee should be asked to determine the length of time to be inserted in the clause.

5. (c) Broken Terra-cotta (1) Porous.—Broken porous terra-cotta for use as a concrete aggregate shall be (a) from clean and well-burnt earthenware, unglazed, which has been mixed before firing with some combustible material such as sawdust, so that

after firing it is of a porous or cellular texture, or (b) from clean and well-burnt unglazed earthenware which is capable of absorbing at least.........per cent. of its own weight of water. (2) Dense.—Broken dense terra-cotta for use as a concrete aggregate shall be from clean and well-burnt earthen or stone ware, unglazed, and shall be incapable of absorbing more than.........per cent. of its own weight of water.

Note.—It was decided that the Tests Sub-Committee should be asked to determine the percentages to be inserted in these clauses.

Natural Materials for Aggregates.

6. Natural Ballast (Gravel).—Natural ballast for use as a concrete aggregate shall be gravel from river beds, sea coasts or glacial deposits, washed, if necessary, to remove dirt, loam, earthy or saline matter, clay, and other foreign substances.

7. Volcanic Rocks.—All rock of volcanic origin for use as a concrete aggregate shall be entirely free from decomposed parts and must show no signs of expansion, disintegration, or dissolution after having been immersed in water for 72 hours. Rocks of this nature may be divided into the following classes:—(a) Basalts, traps, dense lavas, etc., weighing not less than.........lbs. per cubic foot. These shall be dense, thoroughly vitrified, not scoriaceous, show a clean fracture when broken, be homogeneous and free from marked cellular structure. (b) Lavas and rocks of similar character weighing not less than.........lbs. per cubic foot. These shall be hard and free from all soft or organic matter, but they will not be so hard, and will be more cellular than those of section (a). (c) Pumice weighing not more than ....lbs. per cubic foot. It shall be hard, free from all organic matter, soft dust or impurity, and show a bright silky structure when broken.

Note.—It was decided that the Tests Sub-Committee should be asked to determine the weights to be inserted in these clauses.

8. Granite.—Granite for use as a concrete aggregate shall be obtained from.........(here insert name of quarry), and shall be reduced to the specified dimensions by crushing or breaking, and shall be close, hard, and of even texture; free from large crystals of felspar, dirt, argillaceous or organic materials, all decomposed particles, and from dust that will pass through a 1-16-inch mesh.

9. Sandstones, Limestones, Quartzites, and Rocks of Similar Character.—Rocks of these characters for use as concrete aggregates shall be dense, uniform, and homogeneous in structure and composition. They shall have small, even grains and crystalline texture.* Fractures shall be clean and free from large flaws. The weight of the material shall not be less than 130 lbs. per cubic foot, nor its crushing strength less than 200 tons per square foot, and it shall not absorb more water than 8 per cent. of its weight after immersion for 24 hours. The aggregate after preparation shall be free from all dirt, decomposed rock, argillaceous and organic material.

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*This is not intended to exclude Oolites otherwise suitable.

REINFORCED CONCRETE FACTORY AT HARROW.

An extensive reinforced concrete factory, which has just been completed at Harrow for the Kodak Company is here illustrated. The building, which measures 337ft. without a cross wall by 39ft. 7½in. wide, consists of two floors and roof in one part, and in the other portion three floors and roof. The first floor is supported by a row of columns which run the full height of the building, supporting the intermediate floors and roof, the section of these columns at ground floor being 14in. by 14in. reduced to 10in. by 10in. on upper floors.

The first floor girders run from wall to wall, being supported in the centre by the columns, the clear spans being 19ft. 9in., section of main girder 21in. by 12in. Between these run intermediate beams, 14in. by 9in., forming panels 16ft. by 6ft. 7in., the 4in. floor being supported on these beams.

The main roof forming covering to first floor is of rather unusual design, as, owing to the prohibition of projecting beams, it is constructed in a clear span of 19ft. 9in., being supported on one side by a single girder running the full length of the building between the columns, and by the wall on the other.

This floor, which is 12in. thick, is constructed with tiles to section as shown on detail, 12in. by 12in. by 10in., with a 4in. space between the tiles, which is filled in with concrete and reinforcing rods, so forming small concrete beams at 16in. centres, the tiles being covered with a 2in. layer of concrete, which is weathered with vulcanite. The necessary falls were formed in the centering, so doing away with the necessity of thickening up the concrete topping. The upper roofs were constructed in a similar manner. The concrete throughout was composed of crushed ballast, washed sand, and cement gauged in the proportions of 1 cement, 1⅔ sand, to 3⅓ crushed stone.

Messrs. D. G. Somerville, the contractors for this work, which they are constructing on the Kahn system, report that they have at the present time an exceptionally large number of important contracts in hand, and that they are just starting on what will probably be one of the largest reinforced concrete buildings in the South of England, namely, new printing works at Blackfriars, and it is anticipated this will take at least a year to complete; and as there will not be a brick or steel joist in the building, this should form a notable addition to the increasing number of complete reinforced concrete buildings in this country.

REINFORCED CONCRETE FACTORY, HARROW.
The building measures 337 ft. long by 39 ft. 7½ in. wide.

REINFORCED CONCRETE FACTORY, HARROW
The floor girders run from wall to wall, the section of the main girder being 21 in. by 12 in., the clear spans being 19 ft. 9 ins.

Federation News.

MANCHESTER, SALFORD, AND DISTRICT ASSOCIATION.

Secretary: J. Tomlison.

Since the last report two new members have been elected into the association. The joiners' branch, after two years' negotiations with the operatives, have now arrived at a settlement regarding their working rules, with the exception of the district within which the same are to apply. As this is likely to take some considerable time to define, owing to the Manchester district being so closely surrounded by other federated districts who will have to be consulted, the amended rules have been issued as far as they have been agreed to.

The plasterers' branch have also completed their negotiations with the operative plasterers and labourers for amended working conditions, the chief amendment being the abolition of the old walking time rule, which has been superseded by payment of expenses in and out each day, the men to be on the job at starting time. This alteration has also been gained by the joiners and masons' branches, so that as far as the three trades are concerned walking time has become extinct. The masons' branch, after taking their dispute with the operatives before the whole of the boards provided under the national scheme, failed to attain any settlement, with the result that they at first declined to accept arbitration as recommended by the National Board, and after receiving the support of the association and of the Lancashire and Cheshire Federation they decided to enforce their notice for a reduction in wages and amended working hours. The men struck against this notice on July 10th, and after being out on strike about two days the employers, acting on the intervention of the Board of Trade, who had interested themselves in the matter, decided to place the same before a Board of Trade arbitrator, and the men immediately returned to work. Since then a joint meeting has been held with the operatives, and all rules, with the exception of the wages and working hours, were mutually agreed upon. The arbitrator appointed by the Board of Trade (A. A. Hudson, Esq.) heard the case in Manchester on Monday, the 9th inst., and he awards a reduction in wages of ½d. per hour with extended working hours, practically the old conditions prior to their being amended by the local Conciliation Board twelve months ago by a mistaken vote. He also decided that the amended conditions shall take effect as from Saturday, the 14th inst., and remain in force at least twelve months from the date of his award, during which time no notice for alteration shall be given by either side. This means that the employers of masons have carried every point which they set out to recover, as contained in their notice to the operatives. The General Committee of the association have under consideration the question of "municipal trading," and the matter is being discussed with a view to approaching both the Manchester and Salford Corporations thereon.

THE BELGIAN MASTER BUILDERS

Dinner given by the London Master Builders' Association.

On Thursday evening last, August 12th, the London Master Builders' Association entertained to dinner at St. Ermin's Hotel, Westminster, a number of Belgian master builders, whose tour in England, which extended over seven days, ended last Saturday. Among those present at the entertainment were the following:—Mr. F. G. Rice, president L.M.B.A., in the chair; Mr. D. S. Rice, Mrs. Rice, Mr. Arthur Brown, Mr. E. J. Brown, Mrs. Brown, Mr. A. G. White, secretary N.F.B.T.E., of G.B. and I.; Mr. W. F. Wallis, Mrs. Wallis, Mr. Fredk. Higgs, Mr. G. Bird Godson, Mr. James S. Holliday, Mr. Leonard Horner, Mr. H. W. Horner, Mr. Joseph Randall, Mr. A. W. Turnbull, Mr. H. Knight, Mr. C. Wall, Messrs. J. Chessum and Sons, Mr. Albert Monk, Mr. J. W. Jerram, Mrs. Jerram, Mr. E. A. Hough, Mr. G. H. Parker. Among the Belgian guests were Mr. Vandewren, V.P., of the Brussels Association; Mr. Hesbain, president of the Antwerp Association, and V.P. of the Belgian Federation; and Mr. Van Autryve, president of the Ghent Association.

At the conclusion of the dinner, the chairman (Mr. F. G. Rice) addressed the gathering in French. As, he said, their guests were doubtless anxious to make the best of their brief visit, the toast list would be short. He regretted that the expected friends from Sheffield had been unable to attend the dinner, but their absence was unavoidable. He had received a telegram conveying their regrets and wishing the Belgian visitors an excellent and enjoyable time.

The toasts of "The King" and of "His Majesty King Leopold" were enthusiastically accorded with musical honours.

Mr. Hesbain, speaking in English, said the President had addressed them in the French language, which was one of their two national languages, and he would do his best to reciprocate the compliment by addressing them in English. They must excuse him if his attempt proved a failure, as he doubted his ability to speak so successfully in English as the President had done in French. In the name of the National Federation of Belgian Builders, of which he had the honour to be vice-president, he thanked their host and his friends for the hearty way in which they had been received, and for the hospitality which had been bestowed upon them since the moment of their arrival. It was extremely kind to give them such a reception, and to entertain them to such a princely dinner. He was glad that the health of their King had been drunk in a manner not only of loyal subjects, but of builders. Their sovereign was known as the "King of Builders." To be in sympathy with the great English nation was surely good, and he believed could only tend to promote that friendliness which they all desired. Last year, when they had received the Sheffield builders at Brussels, a mutual friendliness had arisen, and it was directly owing to that visit that they were here now. He could not thank them enough for the kind reception, but he hoped that their English friends would come in great numbers to the International Exhibition to be held at Brussels next year, when they hoped to pay back the kindness they had received.

The chairman, speaking in French, then proposed the toast of "Our Guests." He said: "Ladies and gentlemen,—Here we have a complete picture. Round this table are gathered the builders of two different countries, for, although our lands are separated by the North Sea, our wishes and our aspirations are exactly the same. The visit you have honoured us with has caused us great pleasure, and I hope it has been the same for you, and that you have enjoyed our company. I am sorry that your visit has occurred during the holiday season, and that owing to this dining room not being large enough to hold us all only a small reception committee of our association could be here to meet you. I hope I shall visit Belgium next year for the purpose of seeing the International Exhibition of Brussels, as doubtless many of my countrymen will do, which you are now so busily preparing for the enjoyment and edification of your visitors, and which I feel sure will be the great success it deserves to be. Some of your countrymen visited this country two months ago and were successful in winning the Great Challenge Cup at Henley, and, although you do not return to your country bearing the laurels of victory, I hope you will take back with you many happy memories from England. I know that you have in Belgium a great number of buildings which are excellent examples of good design and construction, and which can truly be called works of art. I hope that your visit to England has not disappointed you, and that you have observed some of our buildings, both ancient and modern, worthy of your remark, and of which we, as Englishmen, are so justly proud. We are all united in the desire of beautifying our different countries with fine buildings, but here in England we have not so often the opportunity of doing so as we should wish, as the state of the building trade is now very depressed. I hope it is not the same in Belgium, and that you may always have in your own country plenty of work to occupy your time and abilities. We are glad to see the ladies amongst us, and I shall ask my friend Mr. Higgs to propose a toast to you.

I give you the toast "Our Guests," and success and prosperity, coupled with the name of Mr. Van Dyck, the worthy president of the Chambre Syndicale des Entrepreneurs de Travaux des Belges."

Mr. Vandewren, speaking in French, replied to the toast, and Mr. Arthur Brown afterwards summarised the remarks in English. Mr. Vandewren, he said, was pleased to be associated with the health that had been proposed. He would like to thank them for the way in which they had been received in London. He was most happy to think that their friends proposed to come to Brussels next year to see the great buildings and the objects of art. Let the members ever bear in mind the words, "One for all and all for one," and they would go forward hand in hand to success. He drank to the society and to the president. Mr. Van Autryve then addressed the meeting in Flemish, and Mr. Hofman (secretary of the Chambre Syndicale) translated his remarks into English. Mr. Van Autryve was glad to be able to voice his thanks for the generous way in which they had been received in England. Wherever they had gone they had been greeted in a most hearty and friendly manner. Mr. Fredk. Higgs, speaking in French, then proposed the toast, "The Ladies," which was received with obvious delight.

Mr. Hofman responded for the Belgian ladies in English, and said that, judging from the nice words that Mr. Higgs had spoken, he was unmarried. In the name of his fair countrywomen he heartily thanked Mr. Higgs for the toast. At the request of the President, Mr. E. J. Brown made a humorous valedictory speech in French, which was also punctuated by bursts of spontaneous mirth, which conveyed in no uncertain way the whole-hearted appreciation of the happy Belgians. With this the dinner concluded.

Trade and Craft.

Messrs. J. F. Phillips and Son, of 21, Old Queen Street, Westminster, S.W., Brighton and Liverpool, who are the licensees for the Cable system of heating, have now in hand the following installations, viz.: The French Hospital, Shaftesbury Avenue, W.; the Borough Hospital, Brighton; the Royal Alexandra Hospital for Sick Children; the Sussex Eye Hospital. The Cable system, owing to its independence of levels and avoidance of all underground ducts and channels, in addition to its other many advantages, renders it specially advantageous in hospitals, asylums, schools, and public buildings generally.

Insurance.

Free £500 Accident Insurance Coupons have this week been sent to the following: J. C. S. (Edinburgh), G. W. B. (Mansfield), C. B. (Reading), H. V. (Reading), G. W. W. (Newcastle), W. M. E. (Liverpool), E. F. H. (Newbury), H. B. (Plumstead), J. C. (Manchester), W. R. G. (Southgate), G. B. L. (Bournemouth), W. H. H. (Royston), J. G. T. (Abergavenny), L. S. (Huddersfield), F. M. (Reading), J. D. C. (Notting Hill), C. S. (Manchester), H. J. A. (Ashburton), L. H. (Holmfirth), G. H. D. (Birmingham).

Five Years Ago these Two Men Started Level

—one is still at his bench, toiling hard and long for a slender pittance—the other now occupies a high-grade position in his profession, enjoying high pay, congenial work, influence and power. What is the reason of the present difference in their fortunes? It is not that the successful man has more brains than his "stand-still" colleague of five years ago—**but he does know better how to use them.** In a word, he has **trained** his brains on practical remunerative lines, while the man still at the bench has not.

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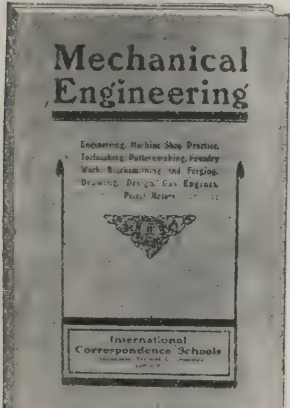
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Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Berkeley (Glos.).—For the proposed new Council school, Berkeley, for the Gloucestershire Education Committee. R. S. Phillips, architect, Midland Bank Chambers, Gloucester.

	Estimate No. 1. Main Building. £	s.	d.	Estimate No. 2. Cookery Centre. £	s.	d.	Total. £	s.	d.
John Coats, Bristol ...	4,874	14	4	724	10	8	5,599	5	0
King and Sons, Gloucester ...	3,539	0	0	514	0	0	4,053	0	0
E. Love, Bristol	3,340	0	0	509	0	0	3,849	0	0
J. H. Gurney, Gloucester ...	3,226	0	0	463	0	0	3,689	0	0
A. S. Cooke, Stroud ...	3,193	6	3	492	9	1	3,685	15	4
Collins & Godfrey, Tewkesbury	3,159	0	0	473	0	0	3,632	0	0
E. Walters & Son, Bristol ...	3,155	0	0	467	0	0	3,622	0	0
P. C. Cousins, Gloucester ...	3,100	0	0	479	10	0	3,579	10	0
Wm. Jones, Gloucester ...	3,100	0	0	460	0	0	3,560	0	0
A. J. Colborne, Swindon ...	3,095	10	0	464	0	0	3,559	10	0
Orchard & Pier, Stroud	3,046	0	0	454	0	0	3,500	0	0
W. T. Nicholls, Gloucester ...	3,070	0	0	427	0	0	3,497	0	0
Bloodworth & Son, Dursley ...	3,058	0	0	436	0	0	3,494	0	0
Byard and Son, Gloucester ...	2,984	0	0	450	0	0	3,434	0	0
H. Dorse, Cradley H'th	2,950	0	0	470	0	0	3,420	0	0
Dimery and Sons, Berkeley ...	2,937	16	0	435	8	0	3,373	4	0
Wm. Crane, Nottingham...	2,897	0	0	443	6	10	3,340	6	10
C. Griffiths, Lye ...	2,880	0	0	435	0	0	3,315	0	0
Adams & Jefferies,* Bristol ...	2,590	0	0	448	0	0	3,038	0	0

*Accepted.

[Owing to an unfortunate error, the above list of tenders was published in an incomplete form, in our last issue. We now give the full list.]

Bakewell.—For erection of baths, for the Urban District Council:—

	£	s.	d.
G. W. Wainer, Nottingham	£3,781	3	5
J. Williamson, New Mills ...	3,773	0	0
W. M. Sharp, Leicester	3,732	0	0
G. A. Pillough, Nottingham ...	3,559	0	0
F. W. Messom, Nottingham ...	3,552	0	0
Scattergood and Son, New Mills	3,399	12	2
H. Cook and Sons, Sheffield ...	3,318	0	0
J. Oakes, Buxton	3,317	18	0
Evan Bros., Alfreton	3,211	14	7
T. Allson and Son,* Bakewell	3,203	0	0
J. W. Wildgoose, Matlock ...	3,110	8	3
W. J. Eyre, Longstone	3,087	9	2

* Recommended for acceptance.

Bournemouth.—Accepted for erection of sea wall and west undercliff promenade to be constructed along the beach between the pier and the west cliff lift, and other works in connection therewith, for the Corporation.
T. Wilkinson and Co., £6,056.

Cardiff.—For the proposed extensions of the Cardiff Infirmary. Mr. E. M. Bruce Vaughan, F.R.I.B.A., architect, Cardiff:—

	£	s.	d.
S. Shepston and Sons	£37,703	15	0
F. Britton	37,604	0	0
W. E. Blake, Plymouth... ...	36,964	0	0
Stephens, Bastow and Co., Ltd., Bristol	36,255	0	0
W. Williams	36,000	0	0
W. Cowlin and Son, Bristol ...	35,900	0	0
D. Davies and Sons	35,550	0	0
Bosworth and Lowe, Nottingham	35,546	0	0
E. R. Evans Bros.	34,849	0	0
C. Moss and Son, Loughborough	34,800	0	0
W. Symonds and Sons	34,754	7	4
E. Turner and Sons	34,666	0	0
J. Charles, Newport	34,659	0	0
D. W. Davies and Howell ...	34,498	0	0
J. Allen	34,453	7	10
Knox and Wells	34,143	0	0
W. Thomas and Co.	33,786	0	0
F. Bond	32,851	0	0

Rest of Cardiff.

(*Tenders continued on page viii.*)

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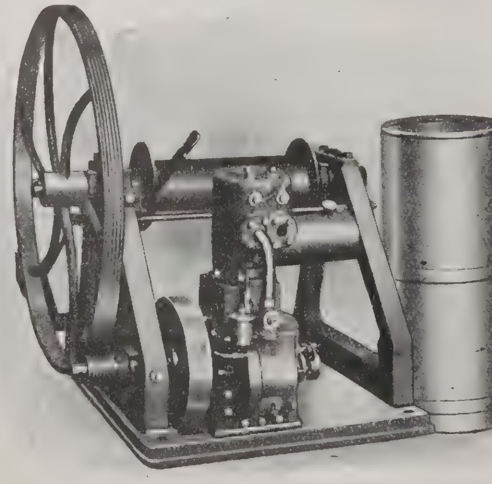

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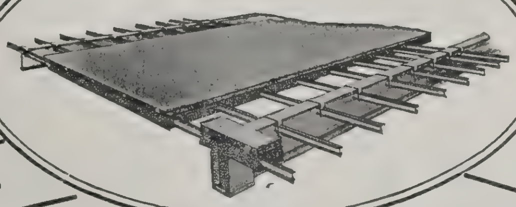

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(Tenders continued from page vi.)

Colchester.—For erection of a hall and cottage at Colchester, for the Colchester Lodges of the Independent Order of Oddfellows, Manchester Unity Friendly Society:—

A. E. Diss and Son	£898	2	9
E. A. Cook	[illegible]		
T. J. Ward	830	0	0
W. C. Palmer	799	0	0
W. Chambers	747	0	0
H. Everett and Son	746	0	0
G. Dobson and Son	740	0	0
R. Beaumont*	725	0	0

* Accepted.

Conway (Wales).—For erection and completion of a new isolation hospital at Croes Ynyd, near Conway, consisting of administrative block, three isolation wards, discharging block, laundry, disinfector, mortuary, stable and coachhouse, boundary walls, etc., for the Conway Joint Hospital Board. Mr. T. B. Farrington, architect, Trinity Square, Llandudno:—

E. Jones and Son, Groeslon, R.S.O.	£12,373	0	0
W. Thornton and Sons, Liverpool	12,350	9	7
E. Thorp and Sons, Llandudno	12,098	6	6
E. Owen, Llandudno	11,989	10	0
H. Martin, Northampton ...	11,814	0	0
T. G. Huxley, Malpas	11,765	0	0
H. Smith, Kidderminster ...	11,628	0	0
R. L. Roberts, Llandudno ...	11,533	16	6
J. Dallow & Son, Birmingham	11,595	0	0
A. Lloyd, Walton, Liverpool...	11,090	0	0
C. Griffiths, Stourbridge .	10,710	2	6
H. Hughes, Llandudno	10,379	15	5
D. Jones, Sons, and Roberts,* Conway	9,942	6	11

* Accepted.

Hungerford (Berks).—Provisionally accepted for erection of new Council school at Hungerford for the Berks Education Committee:—

Drowley and Co., Woking	£7,757

London.—For various works for the Metropolitan Asylums Board:—

Eastern Hospital—Additional accommodation for male staff.

W. Silk and Son, Homerton ...	£2,713	0	0
Gathercote Bros., Norbury ...	2,682	4	1
Weibking & Co., Ltd., Hackney	2,590	0	0
J. C. Richards and Co., Paddington	2,499	0	0
W. Pattinson and Sons, Ltd., Parliament Street, S.W. ...	2,324	0	0
R. Woollaston and Co., Limehouse	£2,300	0	0
L. Kazak, Belvedere	2,291	0	0
W. Lawrence and Son, Waltham Cross	2,288	0	0
F. and A. Willmott, Ilford ...	2,287	0	0
B. E. Nightingale, Albert Embankment, S.E.	2,265	10	0
W. J. Fryer and Co., Paddington	2,264	0	0
W. Shurmur and Sons, Ltd., Upper Clapton	2,232	0	0
F. Webster and Son, East Dulwich	2,199	0	0
F. and G. Foster, Norwood Junction	2,110	0	0
Pasterfield and English,* 58, Sunnyhill Road, Streatham ...	2,053	0	0

(Engineer-in-Chief's estimate, £2,275.)

Head Office—Cleaning, painting and repairs.

B. E. Nightingale	£360	0	0
Wickstead and Beardsell, Adelphi, W.C.	355	0	0
G. W. Matthews, Holborn, W.C.	353	0	0
Aldin Bros. and Davies, Queen's Gate Gardens, S.W.	337	0	0
W. A. King, Melbourne Works, Brixton	273	0	0
G. H. Gunning and Sons, Erith, Kent	260	0	0
Bridge, Barrett and Co., Ltd., Regent Street, S.W.	243	10	0
D. T. Bostel and Sons, Ebury Street, S.W.	239	0	0
Vigor and Co., Poplar	215	10	0
L. Kazak*	205	0	0
R. Woollaston and Co.	145	0	0

(Engineer-in-chief's estimate, £230.)

South-Western Hospital—Repairs to slate roofs and chimney stacks, etc.

J. Darch, Whitefriars Street, E.C.	£525	10	0
Weibking and Co., Ltd.	338	0	0
D. T. Bostel and Sons	330	0	0
W. Reason, Rosebery Avenue, E.C.	329	0	0
Turtle and Appleton, Clapham Junction	289	0	0
E. Wall, Summerstown, Tooting	265	0	0
Gardner and Hazell, Islington ...	263	0	0
T. Robinson, Kilburn	259	0	0
B. E. Nightingale	231	0	0
L. Kazak	229	0	0
S. Squire, 25, Saxon Road, Bow...	223	11	7
W. A. King*	180	0	0

Engineer-in-chief's estimate, £235.)

*Recommended for acceptance.

Kingston-on-Thames.—For skating rink, Penrhyn Road, Kingston. Mr. Alfred Mason, architect, Broughton Chambers, Victoria Road, Surbiton.—

T. Watt	£4,500
Lewis Bros.	3,804
Rice and Sons	3,663
Minter	3,589
McC. Fitt	3,575
W. Irwin	3,527
W. Watson	3,479
Oldridge and Sons...	3,463
Sheffield Bros.	3,463
F. Hawkey	3,425
B. E. Nightingale	3,270
Collinson and Co.	3,237
Dorey and Co.	3,232
Pimpus and Sons,* Surbiton and Kingston	3,167

* Accepted.

London, S.E.—For the erection of new offices, Blackfriars Road, S.E., for the Trustees of the Sons of Temperance (London Grand Division). Mr. Arthur C. Russell, architect, Ilford. Quantities by Messrs. Andrews and Read, 13, Basinghall Street, E.C.

H. Knight and Sons	£6,987
J. Dawson	6,907
John Ham	6,490
George Brittain	6,190
Rice and Son	6,271
Hall, Beddall and Co.	5,893
Battley, Sons and Holness	5,843
Higgs and Hill	5,794
Holloway Bros.	5,750
Fairhead and Sons	5,695
T. H. Kingerlee and Sons	5,579
J. Marsland and Son*	5,260

Architect's estimate £5,400.

* Accepted.

Penyrheol (Wales).—For erection of 18 houses at Penyrheol, near Caerphilly, for the Bargoed and Abertridwr Building Club, No. 2. Mr. P. Vivian Jones, P.A.S.I., Hengoed, architect and surveyor:

H. J. Davies, Bargoed Cardiff	£3,779	16	0
W. Cosslett, Ystrad, Mynach, Cardiff	3,762	0	0
D. M. Isaac, Ynyshir, Glam....	3,555	0	0
D. Williams, Gilfach Street, Bargoed...	3,544	4	0
Davies and Lloyd,* Senghenydd	£3,510	0	0

* Accepted.

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August 25, 1909.

Volume 30. No. 759.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

This issue contains the Official Reports of the National Building Trades Federation, and articles of special interest to Builders and Contractors.

Caxton House, Westminster.

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The Ideal Home Discovered. To see ourselves as others see us may be a medicine for the soul, but it is apt to have a nasty taste. An American contemporary, who has been comparing English domestic architecture with that of American country and suburban houses, has kindly done his best to sweeten the mixture. He remarks on "the ability and ingenuity of our English brothers" (we thank him for that word) "to secure pleasing textures in the surfaces of walls and roofs." He states further that "the picturesqueness, the amazing variety, the distinct individuality, shown in the materials used and in the manner of employing them, are sources of continual wonder and admiration to us." So far the comparison appears to be in our favour. But it is evident that, in the opinion of our critic (who, however, is much too polite to say it outright), the Americans transcend us in the vital affair of planning, their supremacy in this matter being much greater than ours in the other, so that it is not really a case of "honours divided." "It has often seemed to us," says our American brother, "that the majority of the English country houses were designed from the outside in. To us, the English plan seems entirely a secondary matter. If the English architect secures a picturesque mass and a harmonious combination of materials and textures, the battle is won—the arrangement of the interior may be "divided to suit the tenant's needs,' if possible. If the given mass cannot be so subdivided, the tenant's needs will suffer, not the exterior appearance of the building." Our critic thinks that a reason for the avoidance of direct connection between closely related portions of the interior is the Englishman's ingrained love of privacy. 'It is natural for us [the Americans] to try to express in the exterior of a house the disposition of the interior. If we recognise at a glance when approaching a house that the dining-room is on this corner and the living-room on that, we think the building meets one of the requisites of good architecture. Not so with the Englishman. He wants no one to know, from the outside, anything of the interior arrangement—that is a very personal matter with the owner. And if the visitor wanders hesitatingly through the crooked halls, coming now and again upon an unsuspected little library or lounging-room, never completely grasping the general lay-out, the Englishman has secured his ideal home." In all this there is sufficient truth to raise an indulgent smile on the face of the English architect, who, while well aware that it is one of the canons of design that the house should be built from the plan, is lucky if he has not been compelled in some instances to forgo the rigour of the game in deference to the whims and oddities of obstinate or aggressive clients. He takes leave, therefore, to felicitate his American brothers on their more tractable and more complacent constituency. It is an undoubted fact that whereas the English client is decidedly apt to prefer his own ideas to those of the architect, and is occasionally addicted to fatuous and intolerable meddlesomeness in matters that are too high for him, the American, on the other hand, is commonly shrewd enough to recognise his own limitations, and to refrain from undue interference with the expert for whose skilled advice he is paying substantial fees. This difference in national temperament no doubt exists; but it is, in each case, easy to exaggerate it, and this, we suspect, is what the American critic has done, in order to heighten his contrasts.

Hardships of Tendering. Loose estimating is no doubt, as Messrs. George H. Gibson and Horne Morton observed in the course of a paper on "The Design of Industrial Works," read before the Glasgow Technical College Scientific Society, very unfair to proprietors, as it may launch them on a sea of expenditure that is wider and deeper than they had been led to expect, and, indeed, may conceivably involve them in ruin. The authors are therefore justified in laying stress on the necessity for exceedingly careful ascertainment in estimating for large works. The authors deal mainly with engineering works—and, by the way, they advocate that a single authority should be responsible for the design of the buildings, the steel structure, the power plant, and the transmission system: thus virtually eliminating the architect in favour of the engineer—but obviously the principle is equally applicable to less specialised buildings; and it is equally clear that carelessness in tendering works both ways. It may tend to ruin the builder rather than the client, and, under the system generally in vogue, it is certainly the contractor who is most liable to suffer. Possibly it is the knowledge of this fact that renders corporations and other clients less scrupulous than they should be in accepting tenders that, as compared with those of the other competitors, are so exceedingly low as to suggest to common sense that there must be some error, and that the work cannot possibly be done for the money. The contractor, therefore, well knowing from observation if not from actual experience that, in the event of miscalculation or other mistake, his accepted tender will be saddled upon him without compassion or compunction, owes it to himself also to do his utmost to keep well within the margin of profit. The task is not easy. Since, even under the most favourable conditions, clerks are fallible, and an estimate is at best of the speculative character that its very name implies, it is not at all wonderful that, when the estimators are compelled to race against time, very serious errors occasionally arise. Instances innumerable could be cited of the clerical staff being kept up all night, and for several nights in succession, getting out estimates of which ridiculously short notice had been given. It has often struck us that the acceptance of the lowest tender is a crude and barbarous way of deciding such competitions. On the face of it, there is something bordering on absurdity in the assumption that the lowest bid will secure the best bargain. It would perhaps be better for all concerned if it were the practice to accept, not the lowest tender, but that which approximated most closely to the mean of all the tenders received. Anyhow, we must again protest against contractors being harassed into error and then pinned down to it in the merciless fashion with which we have become only too familiar. The law on the subject seems to be badly in need of revision.

"Light" Humour. Even a Consistory Court is not exempt from the occasional intrusion of light comedy, or of the delicately ironical humour which is commonly called Gilbertian. Mr. Chancellor North, giving judgment in the Consistory Court for the Norwich Diocese, could not —and perhaps he would not if he could— suppress this latter exhilarating element. The matter before him was quite simple. Application was made for a faculty to remove from Kilverstone Church a stained-glass window and substitute cathedral glass. The little church (it has seating for seventy persons) was on the estate of the late Mr. Vavasseur, who, being a gentleman of great wealth, had restored the church with great taste and regardless of expense. He had desired the change for which the faculty was sought. When Mr. Vavasseur died, application was made to amend the citation by the substitution of Mr. Vavasseur's successors. Then Chancellor North discovered that the Court was being asked for leave to do something which had been already done; the cathedral glass having been *in situ* for three months! This, of course, was very improper. But who was to blame? Not the architect. The Chancellor did not know whether it was the business of the architect to see that there was a faculty before any work was done to a church. The incumbent? The Chancellor did not think that the incumbent was at all to blame. Then it must have been Mr. Vavasseur who had given the orders for the work, and who was dead. "Mr. Vavasseur had exposed himself to be proceeded against by articles for an ecclesiastical offence; *but, as he was dead, he was out of the jurisdiction of the Court*"—surely a right Gilbertian expression, reminding us very pleasantly of the extra-judicial utterances of the "highly susceptible Chancellor" in "Iolanthe." The faculty, however, was refused on its merits, the Chancellor finding no force in the plea that the plain cathedral glass was necessary as giving more light; "and that left it open for proceedings to place matters *in statu quo*," which means, we suppose, that the cathedral glass must be removed and the stained glass put back. Chancellor North, dealing with the belatedness of the application, quoted with approval the comments of his predecessor, Chancellor Blofield, on a similar case: "The Court should, I think, be very careful in its investigations of cases in which confirmatory faculties are asked for. When important alterations in, or additions to, a church are contemplated, it is obvious that a faculty authorising them should be obtained before the work is begun. To carry out the work without authority, and then perhaps only to apply for a confirmatory faculty when compelled to do so, opens the door to abuse and should not be encouraged; and it should be remembered that to do work requiring a faculty without one, exposes the doer to be proceeded against by articles for an ecclesiastical offence." Yet similar inversions of order are not uncommon. It happens quite frequently that corporations borrow money or begin works before obtaining Parliamentary or Local Government Board sanction. In their case, the plea of urgency may serve their turn; but there is always considerable risk in proceeding in advance of powers; and the awkward position that has arisen at Norwich certainly shows the unwisdom of presumption.

The New Architectural Tour.

The linking-up of London's tramways, which is at length making a near approach to completion—one might almost say, to perfection—possesses much special significance for architects and builders. For one thing, it has relieved, almost too thoroughly, the congested areas which, but a few years ago, made certain districts of London a byword and a reproach. It has given to suburban building operations an exaggerated stimulus, with consequent reaction, the depressing effects of which are on all hands evident in the vast numbers of unoccupied houses tabulated in the return that has just been extorted from Mr. John Burns, who surely must require to summon up all his characteristic optimism in order to view with anything like equanimity these perhaps unanticipated effects of his own strenuously pursued cheap transit policy. Most of the ill-effects, however, can be only temporary; but these, unfortunately, cannot be held to include the miles upon miles of cheap and shoddy dwellings that have sprung up to meet the sudden demand created by the rapid extension of the electric tramway systems. It cannot be denied that, as a writer in the daily Press observes, "the advent of the tramway is rapidly causing the landscape to be blotted by staring new houses and unsightly heaps of bricks and mortar." These, however, are not the only kind of buildings that one can see from the top of the car. A ride of a few miles, in any direction, on 'bus or tram, affords hitherto unexampled opportunities for a rapid superficial survey of London's buildings, old and new. It is now possible to ride by car from Barnet (in Hertfordshire) where the King-maker was killed, to Purley, in Surrey, where Horne Tooke indulged in his linguistic "Diversions." This is a distance—from the Great North Road to the Brighton Road—of some five-and-twenty miles, and it is some of "the houses in between," rather than any of the occasional and scanty, but by no means unlovely, landscape effects, that render the journey worth while to the studious architect or builder. Other journeys, of at least equal interest, and of almost equal length, can be made between North London and Bexley Heath in Kent, or between Purley and Waltham Abbey, which was built by Harold the Saxon, and possibly enshrines his bones. The London County Council's excellent route-book, in which the places of interest in and around London that can be easily reached by tram are enumerated, and in numerous cases illustrated, will now need amplification; and, furnished with this and with Murray, the architectural student will be at no loss for specimens of periods and styles. The linking-up of the tramways should be a valuable factor in his education, providing him with means and opportunities that he will not, it is to be hoped, be so foolish as to despise because they are cheap and obvious. The architect who knows his London thoroughly has achieved not only a professional, but a liberal education.

Earthwork in England.

The discovery of indications of a Roman villa on land controlled by the Associated Portland Cement Manufacturers affords further indication that, lying, perhaps unsuspected, beneath our feet, there are probably enormous stores of interesting relics of the Roman occupation. Indeed, so numerous, of late years, have been the discoveries in this kind, that there is some danger of our becoming sated with them, and indifferent to the value and significance of the treasures that they yield Yet every fresh discovery sheds fresh light on the history and customs, and the artistic and constructive methods, of the wonderful people to whom we owe our introduction to the arts, sciences, and laws of civilisation, and of whose characteristics and institutions we are to some extent the heirs. It would be a great pity, therefore, if the frequency of such finds were to breed the apathy of repletion, or the contempt that proverbially comes of familiarity. Indeed, apathy in such matters is already sufficiently pronounced. Otherwise, the enthusiasts would not be compelled, as they have been in so many instances, to abandon, for want of the necessary public support, excavations that were yielding rich results. The public indifference was brought home rather forcibly the other day to the writer of this note, who, on visiting the Roman villa at Morton, near Brading, in the Isle of Wight, was somewhat scandalised to find that the work there, which has produced such splendid discoveries of pottery, of excellently preserved decorative pavements, of baths, hypocausts, wells, etc., has come to a standstill, although in all probability further excavations would continue to yield a rich reward; and the conditions at Brading are typical of many another baulked investigation. Surely such educative work should not be eternally left to private enterprise, but should be amply subsidised from the national exchequer. Scholarly and enthusiastic workers are not wanting; and, with the necessary funds at command, they would soon collect materials for a really authentic account of the architectural and building methods of the Roman invaders. The most recent discovery of early British remains is perhaps that which was announced last Monday as having been made at Pokesdown, Bournemouth, where, on a hitherto unexplored site, there has been discovered what is believed to be an early British village.

Foreign Factories—Made in England.

The Patents Act having now been in operation for a full twelvemonth, the curious in such matters are taking stock of its effects. These appear to be favourable to building in this country. A foreign manufacturer of an article for which he has obtained a patent in this country must manufacture it here, otherwise his patent may be revoked, so that anybody is free to take up the manufacture in Great Britain. In some instances the revocation of the patent makes no material difference, the patentee holding the field so dominantly as to defy rivalry; for the revocation of his patent rights does not prevent his importing the goods. In other instances, the patentees have found it advisable to take the steps necessary to preserve their patent rights; and it is here that the Act proves beneficial to the British builder. Already, it is stated, twenty-four foreign firms who have thought fit to comply with the requirements of the Act have spent nearly £200,000 on the erection of buildings here; and it is believed that for some years to come the amount will continue to increase, there being as many as 30,000 British patents held by foreigners. Of these, not one in a thousand are likely to build in this or any other country; but, nevertheless, the most pessimistic view of the probabilities affords ground for hope that the Act must result in substantial benefit to builders and landowners, who will perhaps be willing to allow Mr. Lloyd George this comparatively slight set-off against the heavy per contra account represented by his Finance Bill proposals, which, in their assumed general discouragement of building—and even of the making of bricks, if clay-getting is to be taxed—may, indeed, even operate against the building of factories for foreigners. But, when political animus is allowed to pervert the judgment, it is easy to exaggerate both the good and the evil effects of legislation.

LEOPOLD BRIDGE, LIÉGE. GENERAL VIEW.
This illustration of the Pont Léopold, or Pont des Arches, Liége, affords an idea of the general effect. Details of the statuary, coping, etc , are shown at the foot of the page.

THE BRIDGE BEAUTIFUL: AND OTHERWISE.*

By Robert Boyle, B.Sc.

At a moment when the bridging of the Thames may be said to be under revision, the following extracts from a paper on "The Design of Bridges with Reference to Æsthetic Treatment" seem to be peculiarly opportune.

The author contends that in bridge design there need be no sacrifice of practical accuracy, of mechanical precision in workmanship, of reasonable economy, to include the qualities of good proportion, true elegance and beauty, as inherent parts of the structural system. There should fundamentally be a delicate proportion of parts, and every detail should be so chosen, all decorations should so act, as to emphasise, relieve, contrast, or distinguish special and important points in the structural scheme.

Rather than misplace the decoration on a bridge, leave it to tell its own tale without any ornament whatever; but occasionally a slight moulding, a bold accentuation of the arch, a bold marking of the roadway, renders a structure beautiful which might be only useful in appearance. Perfect combination is the secret of beauty. Correct treatment will consist in the unforced combination and mutual supplementing of the elements of the beautiful with those of the good and the true.

The collaboration of engineers and architects will be necessary in all first-class work. It is not a question of sending an engineering design for architectural treatment, as there should, in general, be a constant interchange of opinion, a see-saw of the plans, till the question is argued out and agreement results.

The author realises that no amount of observation of rules will produce a work of art, and that no complete set of rules on æsthetic treatment is possible. The main points emphasised in his paper are thus summarised:—

1. Æsthetic requirements are best met by appropriateness of design, by fitness of the structure for its purpose, by static correctness. This involves the axiom that any violation of engineering principles is also a violation of good taste.
2. The structure should be clear to the perception of the intelligent beholder, and create in him a feeling of satisfaction.
3. All beauty should be more inherent than extraneous.
4. The engineer should aim primarily and fundamentally at beauty of economy and material, beauty of workmanship, beauty of accomplishment, whether traditional architecture be considered or not.
5. The study of nature is the basis of all art.
6. Critics of engineering work are not yet educated up to a due appreciation of structural steel work and what it involves.
7. The main features in any design should be accentuated.
8. There must be no deceit, no suggestion of anything being what it is not: there must above all be truth.

Towards the close of the paper the author described some noteworthy existing bridges, classifying them according to type.

Type I.—Suspension Bridges.

No class of bridge lends itself more to artistic outline and graceful appearance. The outline is almost entirely in the hands of nature, and the curve of the chain is the most suitable for the function of the structure. The form is not radically altered by the subsequent addition of the weight of the platform. A bridge with a horizontal stiffening girder, sometimes assisted by sloping ties from the tops of the towers, is perhaps more useful and more economical, but is less flexible and less beautiful than when no attempt is made to control the flexibility of the chain. The most pleasing designs are those with two supporting towers. Designs with practically straight anchor chains are less graceful, less æsthetic than those with the approach spans supported by land chains with a curve similar to that of the chains in the central span.

Tower Bridge.

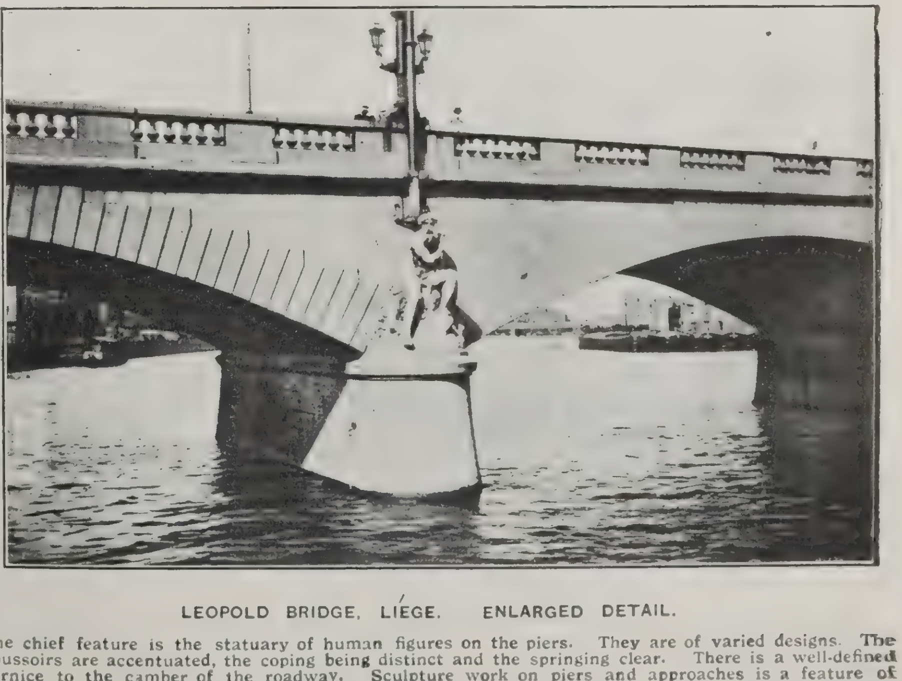
Because of the proximity to the Tower of London, it was originally stipulated that a castellated fortification at the north abutment should be part of the scheme. Such a principle is obviously objectionable. The four stone towers simply serve to enclose or hide four pairs of steel towers, which carry the loads from the suspension cables. The towers are standing in the air on a steel girder. It is all an attempt to make a thing look like what it is not. The heavy chains attached to the ends of the two high-level girders within the towers appear to be supported by the stonework, which they would pull down.

Menai Suspension Bridge.

The bridge is well suited to its surroundings, and is graceful in its details and proportions. If there be any fault, it is that the land arches appear to be redundant, and that the structure would have been more elegant, more proportionate, more a true suspension, if they had been absent and the bridge constructed like the Clifton suspension. A certain amount of stiffness, lateral rigidity, and aid in erection would, however, be given by the arches, and this is apparent to the observer.

Type II.—Arche.

Masonry arches were built by the Romans, and, up to the end of the 18th century, masonry and timber were the only materials used. The first cast-iron arch was 100ft. span, and was built across the Severn at Coalbrookdale in 1779. Since then a remarkable development has taken place, steel being used for all the largest spans. Reinforced concrete has been successfully applied to moderately large spans. Most masonry bridges are under 150ft. span. The segmental and elliptical arches are preferably used for the wider spans of moderate height, while the semicircular arch gives better æsthetic effect when carried on a number of high piers. The treatment of the voussoirs has considerable effect in emphasising the magnitude of an arch. In the best bridges, the shape of each is apparent, and the individuality accentuated. In bridges like the Grosvenor over the Dee there is a heavy moulding on the arched ring, and the separate voussoirs are not distinguished. In the Dean Bridge, Edinburgh, an outer rib has been used beneath the footpath. This construction is a convenient one to apply in widening, as in the case of the bridge over the Rhône at Lyons. Another method, adopted in the Clyde Bridge at Motherwell, is to bracket out the widened portion on the face of the arches, but the former method is



LEOPOLD BRIDGE, LIÉGE. ENLARGED DETAIL.
The chief feature is the statuary of human figures on the piers. They are of varied designs. The voussoirs are accentuated, the coping being distinct and the springing clear. There is a well-defined cornice to the camber of the roadway. Sculpture work on piers and approaches is a feature of Continental bridges rarely seen in Britain.

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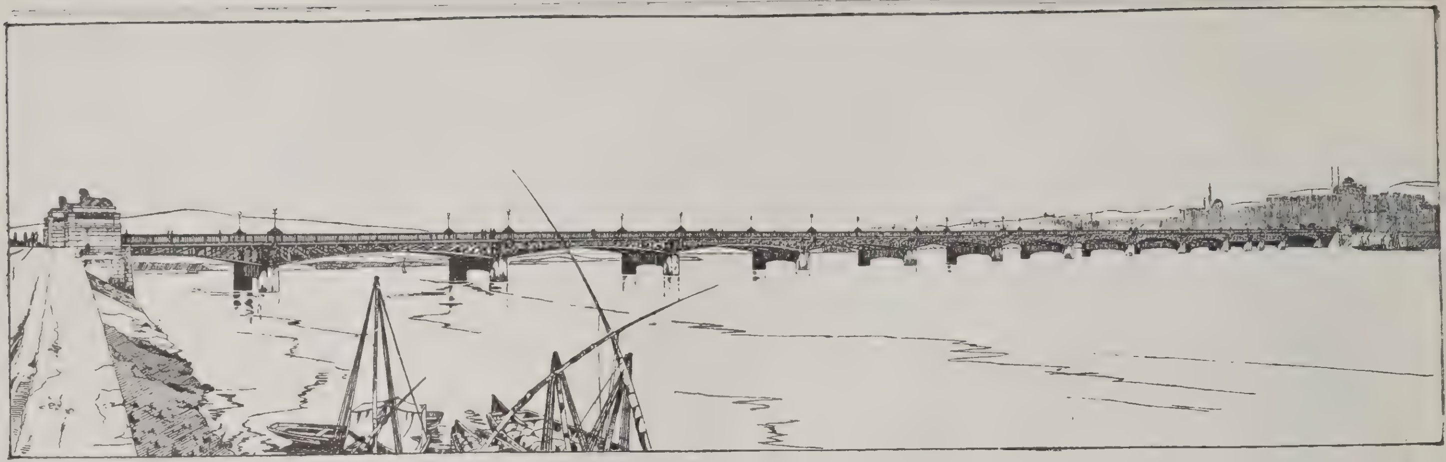
*Extracts from a paper read by Mr. Robert Boyle, B.Sc., before Glasgow Association of Students of the Institution of Civil Engineers.



MAIN BRIDGE OVER THE NILE AT CAIRO.

This was recently completed by Sir Wm. Arrol and Co., Ltd., whose design was accepted in an international competition. Special attention had to be given to æsthetic effect. The curvature of the bottom boom of the main girders is appropriate, and the cast-iron parapet, with rest and light standards, enhances the appearance considerably. The architectural treatment of the abutments was by Mr. R. W. Paul, architect, London.

certainly æsthetically superior. In the case of a number of arches it is sometimes doubtful whether it is better to keep all the crowns on the same level or to keep the proportion of rise to span constant all through. The latter is perhaps better, and it admits of a gradual rise to the centre of the bridge or a camber on the parapet. In the best examples of arch construction the springings at each pier are on the same level.

In steel arch types there are three main divisions:—

1. Those which may be regarded as flat ended. The rib is continuous and generally increases in depth towards the abutments, as in Blackfriars Bridge.

2. Those in which the rib is continuous and is pin-ended or hinged at the abutments only, as in the Zambesi arch, Garabit viaduct, and the bridge over the Rhine at Bonn.

3. Those in which the rib is in halves, and is hinged at both crown and springings, as in the Alexandre III., Paris, and the new bridge, "De Smet de Nayer," at Ostend.

Blackfriars Bridge.

The piers are surmounted by cylindrical columns composed of polished red granite, with pediments and capital of Portland stone. They have the appearance of being immensely strong, are too short and stumpy, and have little reason for their existence. The piers would have been better treated like London Bridge. The correct treatment of the face of a pier is that of a buttress to take the thrust, not a weight-carrying member with no weight to carry. The face ribs are of wrought-iron covered with ornate cast-iron fascia. The cast-iron work on the spandrels is commonplace, and the placing of cast-iron rosettes at intervals along the web is wanting in engineering dignity.

Waterloo Bridge.

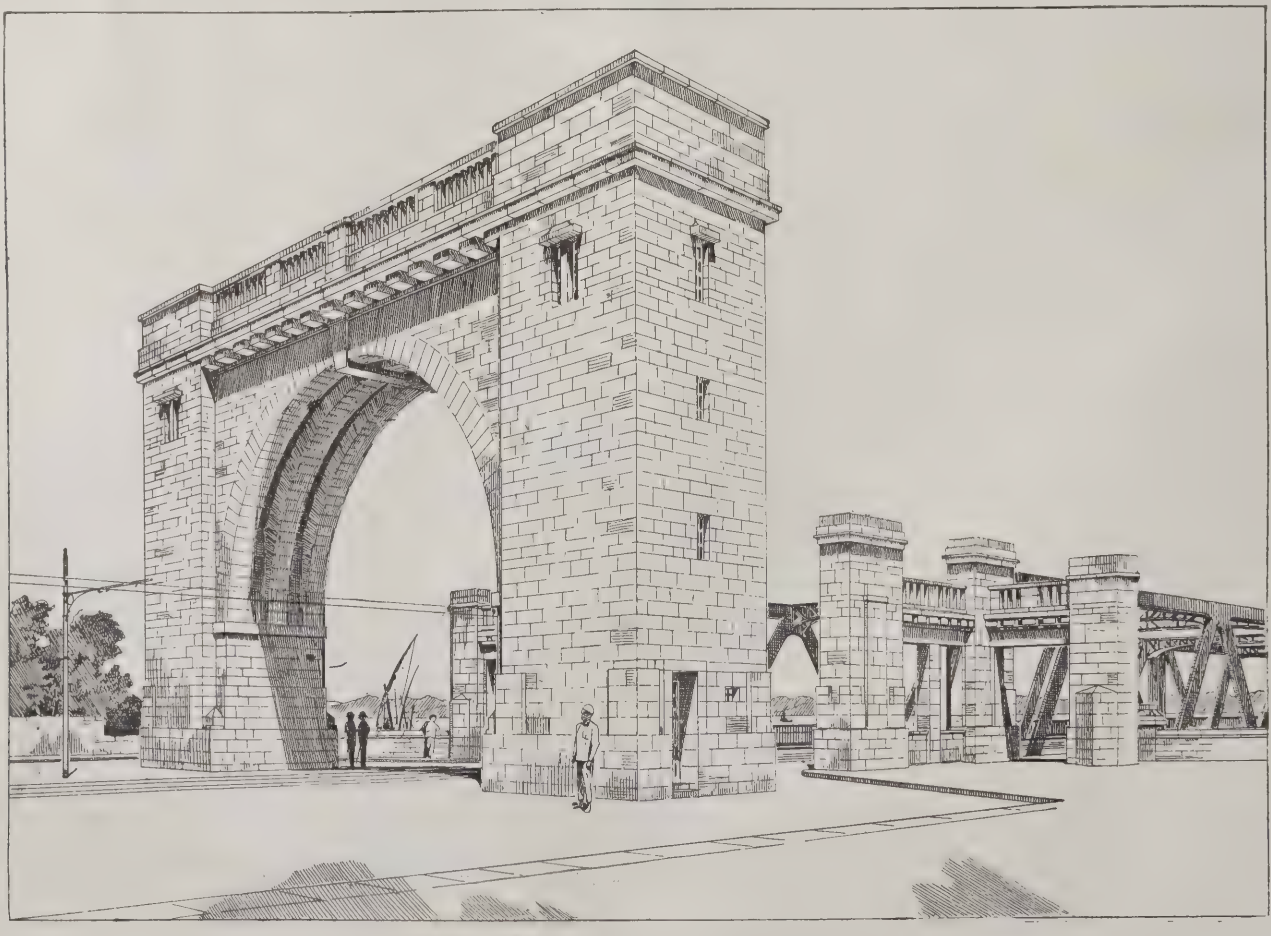
The design is excellent. The arches are semi-elliptic and the keystone is not accentuated. Nothing has been gained in appearance by surmounting the piers with two severely classic Doric columns, supporting an entablature. They are, however, plain and unobtrusive. The balustrade is finely detailed. The lamps would perhaps have been better over the piers instead of over the keystone, though they emphasise the centres of the spans. The whole structure, however, is remarkably graceful and beautiful, though practically level throughout its entire length.

London Bridge.

The treatment of the arch is suggestive of great strength and simplicity, and the whole design is chaste and harmonious.

Great Western Road Bridge, Glasgow.

The moulding as applied to the metal rib is open to criticism. The treatment is Gothic in the pillars on the faces of the piers, and in the cast-iron geometrical tracery in the spandrels. The latter does not blend with the cold heavy cast-iron parapet, nor with the panels which take the place of the tracery in the two side spans. The Glasgow



BRIDGE OVER THE NILE AT BOULAC, CAIRO.

This is an instance of the collaboration which ought to take place between engineers and architects. The sketch of the abutment with granite arch was prepared by Mr. Roland W. Paul, architect, for the engineers.

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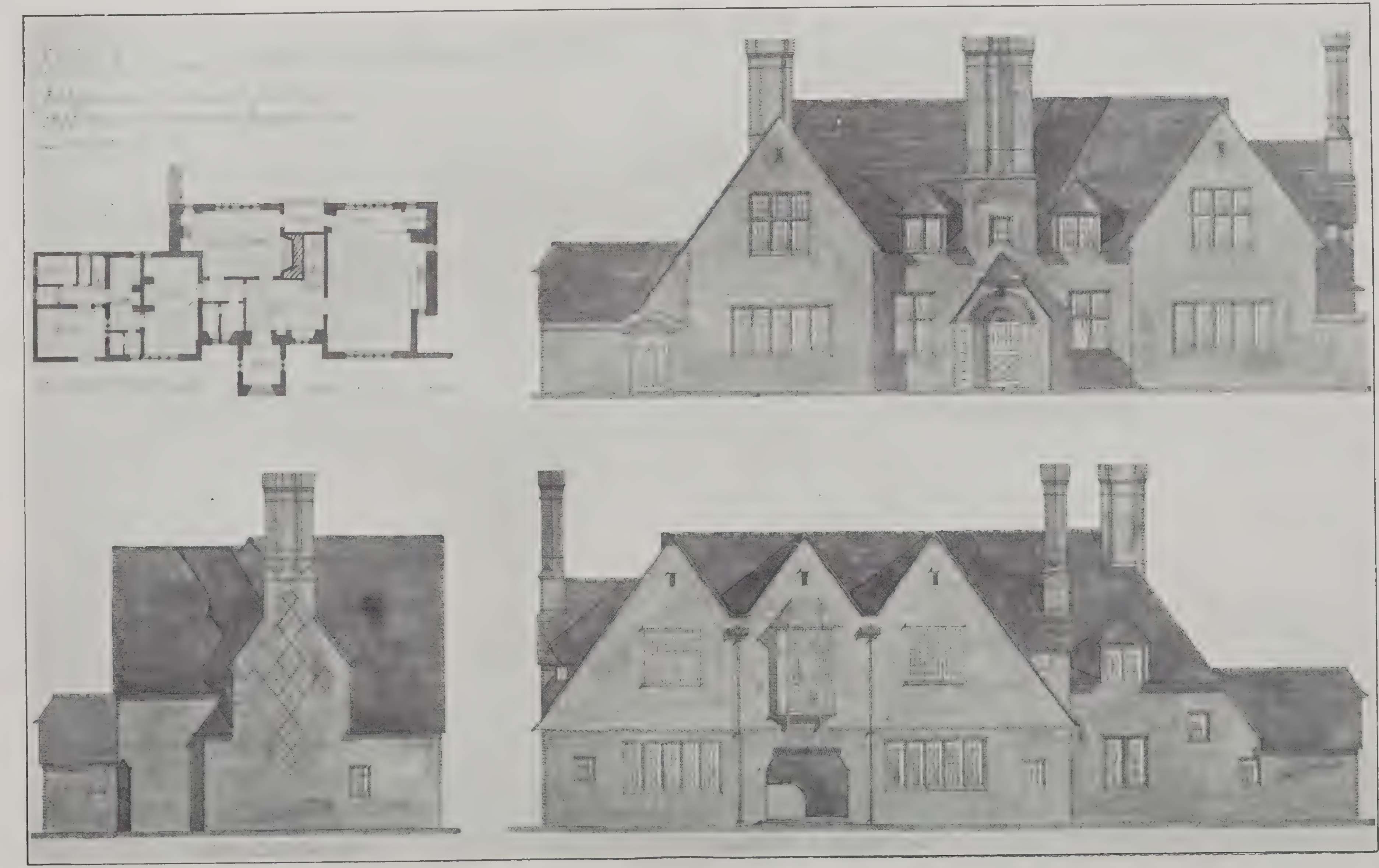

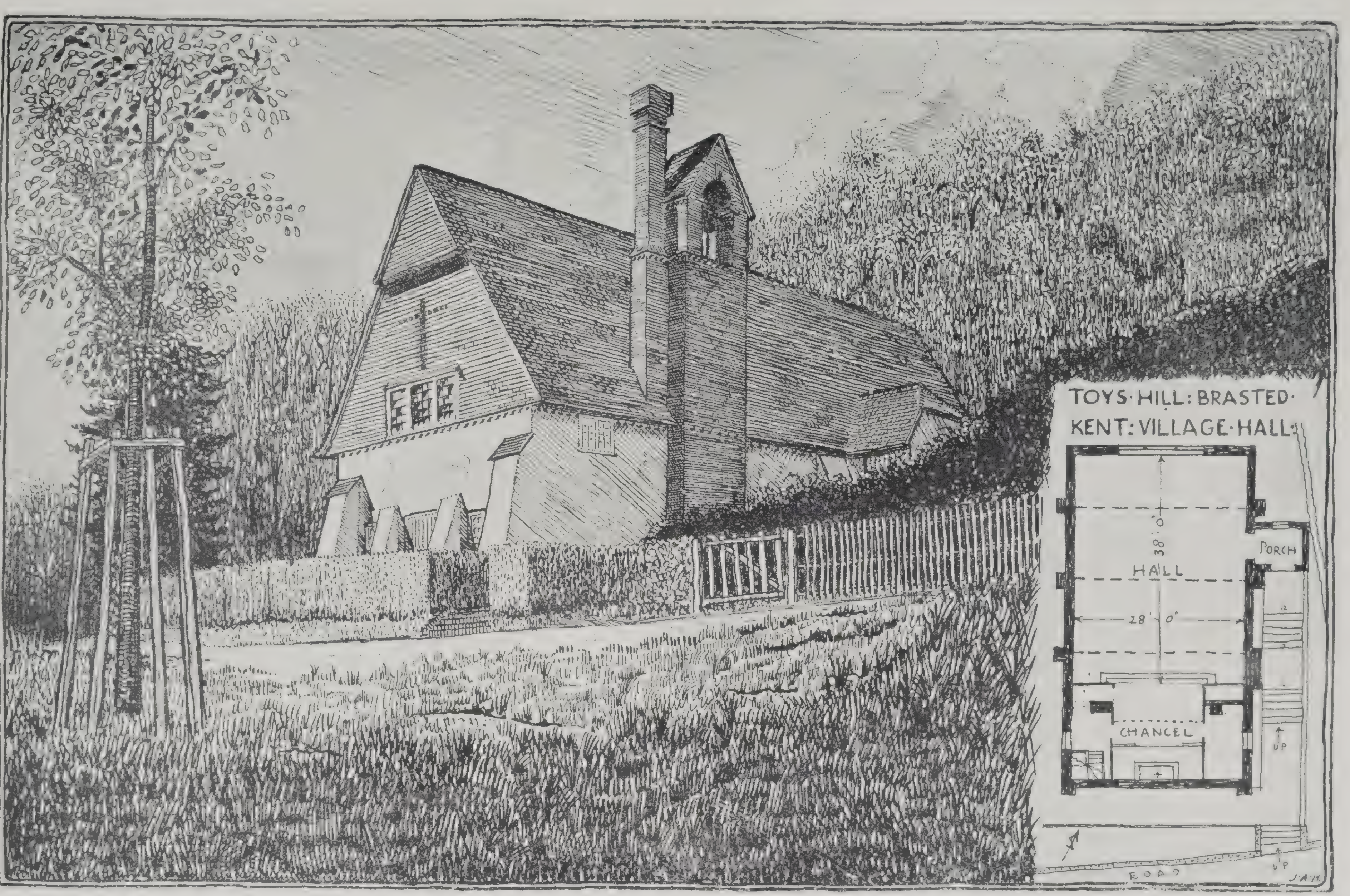

J. ALGERNON HALLAM, ARCHITECT.

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coat of arms on the spandrels is gaudy, out of scale, and inappropriate. The piers are carefully proportioned. The Lendall bridge at York is of cast-iron, and is similar in Gothic treatment. It is beautifully symmetrical, but the cornice is unfortunately interrupted by the arch ring.

Broomielaw Bridge, Glasgow.

The general effect is good. The arch is of uniform ring stones with chisel draft on all the edges, while the spandrels preserve the megalithic character. The piers have octagonal ends, supporting octagonal counterforts.

Le Pont Alexander III., Paris.

This bridge is the joint product of an engineering firm, architectural firm, and three or four of the leading sculptors of the time. The proper place for monumental architecture on a bridge is, as here, on the approaches. Two magnificent pylons flank the entrance at each end, and are fine examples of excellent design. The structure would probably have looked better with small subsidiary arches instead of the ornamental festoons, but the beauties of the bridge are inherent in its curve and outline, its graceful air, its correct proportion.

Type III.—Bowstring Girders and Combinations.

Saltash Bridge, Plymouth.

The towers do not sufficiently balance the ironwork. The upper part of the centre pier is of cast-iron, and was constructed lighter because the foundation was about 100ft. below water level. The difference in construction is therefore justified. The upper parts of the girder are too massive compared with the chains and bracing.

Broen over Sarplossen, Sarsborg.

A roadway is carried below which detracts from the appearance. The piers might have been improved by being treated like the Saltash ones

Type IV.—Parallel Girders.

Britannia Tubular.

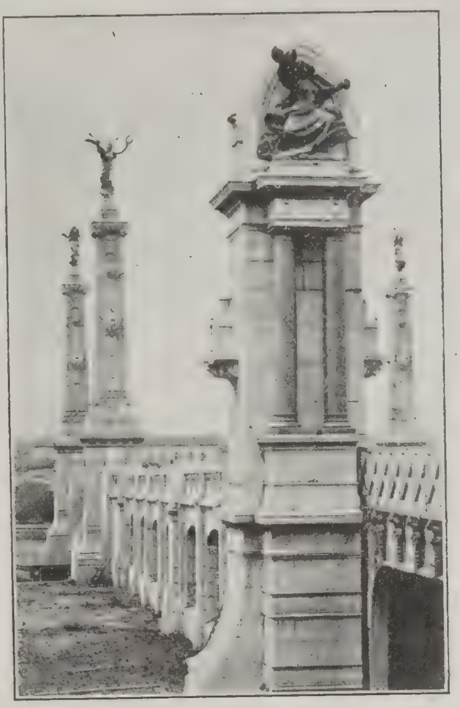
It was pointed out by Sir B. Baker, in discussing "The Æsthetic Treatment of Bridge Structures," that the piers of this bridge were built to admit of chains being used during erection, and perhaps afterwards in addition. It is rather remarkable that a bridge designed for suspension chains which were never erected should be such a fine piece of architecture, and that its prominent features should be largely redundant. It is difficult to say whether the girder is divided or continuous, but the concealment is with artistic effect.

New Caledonian Railway Viaduct over the Clyde at Glasgow.

The piers are substantially treated. An ornamental lattice parapet, with cast-iron cornice, cope, and rosettes, is carried out from the outer main girders on ornamental steel brackets. The appearance is graceful, but the rosettes at the intersections might have been better dispensed with.

Type V.—Cantilever Bridges.

These consist essentially of four divisions. 1.—Those with horizontal lower boom, like "Le Pont Doumer sur le Fleuve Rouge" at Hanoi and the Connel Ferry. 2.—Those with horizontal upper boom, like the Poughkeepsie, New York. 3.—Those with both booms inclined, like the Forth. 4.—Those which are arched and are of the type known as "constrained cantilevers," of which the Viaur viaduct, "le pont Mirabeau," and Dalginross bridge at Comrie are examples. It is wrong to attempt to hide the break in continuity at the junction of the central girder and the cantilevers. Nothing could be worse than attempting to imitate or suggest an arch or a suspension bridge by reducing the depth towards the centre of the suspended girder. It is uneconomical and a violation of the fundamental principles of æsthetics. It is admissible, however, in cases like the Nile Bridge at Cairo and the Harvard Bridge, where the arch is very flat at the suspended girder.



THE NEW BRIDGE, OSTEND.

The view shows the decorative treatment applied to the piers. The succession of high piers crowned with statuary is a very prominent feature on the roadway.

Forth Bridge.

The perspective effect is distinctly good. The batter of the piers in the transverse direction is very tasteful. Ornament on such a bridge would be out of place. The curvature of the lower boom is an excellent feature. Fitness for duty has been the primary consideration, and the bridge, though not pretty, is grand, imposing, stupendous.

Our Plate.

Sketch for the Red House in Hitchin.

This is a sketch designed for a house proposed to be built with small uneven bricks unpointed, the roofs to be covered with dull red hand-made tiles, the windows to have iron casements, lead glazed, in brick mullions and transoms. The three gables to garden are to be covered with rough oak boarding, the window frames in these gables being oak, also the oriel on staircase landing. Mr. J. Algernon Hallam is the architect.

Village Hall, Tongs Hill.

Tongs Hill is a small hamlet about 3½ miles from Westerham. The hall will be on a hill-side, the large gable looking across the weald. The point of view of the sketch is on the road coming up the hill from Edenbridge and Four Elms. The road turns right and left in front of the hall, the small bell gable pointing up the hill along the road. Owing to the steepness of the site, the hall proper is at the first floor level, brick steps externally leading up to the porch. In front on the ground floor will be a small kitchen and heating chamber. The altar and back part of the stage will be consecrated and shut off by a movable screen, there being no church at Tongs Hill. The hall will have to serve for entertainments, and also for purposes of worship. The walls will be covered with rough plaster, the roof covered with hand-made tiles, and the bell turret will be constructed with small bricks unpointed. It may be mentioned that great interest is being taken locally in the hall; the farmers are going to cart materials from the station up the steep hill to the site, digging for foundations, etc., is also being done gratuitously. Mr. J. Algernon Hallam is the architect.

London Suburbs.

Kilburn and Brondesbury.

The change that is passing over the outlying provinces of our enormous capital can nowhere be better studied than in the Kilburn High Road. Approaching it by Maida Vale, which not many years ago was sufficiently far "out" to be quite suburban, with its roomy, handsome Palladian villas and deep gardens, from which there has been a sudden exodus caused by the din and dust of the motor traffic, we turn into Kilburn, close to the site of the old turnpike gate from which Dick Turpin started on his ride to York. Although we are going away from "town," we come not to green fields, but to a district whose inhabitants considerably outnumber those of some manufacturing towns; the High Road is densely crowded with foot traffic, and on Saturday nights is almost impassable, and one of the sights of London; yet a few yards away on either side are quiet suburban roads, and the visitor is driven to ask where the multitudes of people, and especially of working people, live. He will find out by exploring the roads that run beside the London and North-Western Railway, and penetrating into "purlieus" of little cottages behind the main road; a medley like the road itself, and mostly very small, an extraordinary instance of the fortuitous, haphazard growth of later London.

Broadly speaking, the neighbourhood may be divided into two sections, one of which, Kilburn, is built in the style of the "forties" and "fifties," and chiefly faced with stucco; the other, Brondesbury, presents the inevitable red brick fronts and roofs with dormers suggestive of bad upper rooms; it spreads far to the north-west and touches Willesden Green and Cricklewood. The narrowness of the foot pavement of the Kilburn High Road is very inconvenient, but no one seems to have anticipated the growth of the suburb. As we look down its length a very recent change obtrudes itself harshly; this is a procession of telephone supports rising above the roofs: it would seem that in the near future there will be no outlines left to anything. Cannot electrical engineers and architects find some other place for their system?

As usual, the local offices of well-known banks stand out rather conspicuously, but take it for all in all the great main thoroughfare of Kilburn is, architecturally speaking, a mere patchwork, and the road itself too narrow. Actually a town has grown up and cannot find accommodation in a suburb. Public buildings are few and unimportant, though the lofty tower and spire of St. Augustine's, Kilburn, dominate the neighbourhood—a building too well known to need description here. Hard by is the little church of St. John's, whose interior, with its apse, good adaptation of a small clerestory and simple nave arcade, are worth a visit, if only to justify the Victorian architects in their love of English Gothic.

Between the two Kilburn stations there is a length of about a mile of High Road, which is characteristic of Kilburn; there is the comparison of styles of building, never assuming any definite form or the style entirely of our own age so often promised, and there is, unfortunately, the endless disfigurement by gigantic lettering of names of firms, besides advertisements, one or two clothiers leading the way in spoiling Kilburn as a leading house agent spoils West Hampstead. All legitimate purposes of trade could well be served without this exaggeration and repetition. In spite of all defects, however, the suburb is a popular one, and the High Road still retains two pleasant features—the yard and buildings of the Kilburn Brewery and the fine trees of the Grange Elms, a low, rambling house in modern Gothic standing in fine grounds, but the last of its kind left in the district.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable and it must be understood that both question and reply will, as a rule, be published in these columns

Sub-contract Tendering.

CHESHIRE. — TEAK writes: "A builder A has tendered for the erection of a building, but wishing to sub-let one of the trades before himself tendering, he sent out copies of the quantities for this trade, and based his own tender on the price received from B, being the lowest for the trade in question. Having secured the work and signed the contract, he finds, on offering to accept B's price, that B is not willing to do the work. A must perforce go on with his contract, and to do so will have to accept the price for the sub-contract next higher than B's. Can A recover the difference between these two amounts from B? The time which elapsed between receiving B's price and the offer to accept same was three weeks. In tendering, B did not state that he agreed to do the work for that amount if called upon to do so, but simply that his price for the work according to quantities was so much, and signed his name at the foot."

The above question can be answered by a study of the law relating to tenders. When does a person make a tender? A tender is really an offer to do work at a certain price. An offer can be withdrawn at any time before acceptance (*Routledge* v. *Grant*, 1828, 4 Bing., 653), but not afterwards. In other words, a concluded contract comes into existence as soon as a tender is accepted (see, generally, "Emden's Building Contracts," 4th edit., p. 19, et seq.). Applying these principles to the above facts, it seems clear that B was bound to make good his tender as soon as the same was accepted. The fact that he did not use the word 'tender' in making his offer is immaterial, for it was decided in *Crawshaw* v. *Pritchard*, 1899, 16 T.L.R., 45, that where builders wrote,—in answer to a letter inviting a tender:—"Estimate.—Our estimate to carry out the sundry alterations to the above premises, according to drawings and specifications, amounts to the sum of £1,330," and this tender was accepted, they were held liable in damages for refusing to carry out the work. This principle probably governs the present case. It would seem that the only defence B could raise to a claim for the difference between his tender and the next lowest would be that it was an implied term that the acceptance was to be communicated within a reasonable time, and that a delay of three weeks was too long. In law, the courts would doubtless hold that the tender must be accepted within a reasonable time; and what is a reasonable time is a question of fact. *Prima facie*, three weeks ought to be regarded as a reasonable time in this case. BARRISTER.

Rights of Extension of Premises.

LIVERPOOL.—P. D. writes: "In the accompanying sketch [not reproduced] is A allowed to extend his premises to line of iron railing? The portion enclosed with iron railing belongs to him. Both A's and B's shops are very old. Also in the second sketch [not reproduced], is A allowed to build the proposed extension, two storeys (about 19ft.), to eaves? Is there any new law as regards right of light in this case?"

I understand these sketches to refer to entirely different frontages and circumstances. First case.—There is no reason at all why A should not bring forward his shop to the line of the iron railings and of the property adjoining, but to avoid friction, I advise him to let his neighbour B see the drawings before he commences work. Second case.—This is a great deal more difficult than the other case, and I rather doubt whether the extension can be built. The answer to the question depends on the following:—(a) When the proposed new building is completed, will there be left at the rear of A's premises the sufficiency of air space required by the local by-laws? (b) Will the new building materially interfere with the light which B now enjoys through all or any of his three windows? (c) Has C any right of light to his property? No change has recently taken place with regard to the law of easements affecting light and air. Twenty years' enjoyment gives a right which cannot be interfered with, but the damage suffered must be substantial and not of merely a trivial character. F.S.I.

Workmen's Compensation Points.

PROVINCES.—DOUBTFUL writes: "A is a retired builder, and owns a piece of building land upon which he has decided to erect some dwellings; he gave one of his old hands a job to get out the foundations ready for the brickwork, and of course was liable under the Act should an accident have happened to him. This man is now discharged, having finished his job. A decides to let all the labour required in the erections to separate men under the several trade heads, the brickwork at so much per rod, the carpenters, slaters, plasterers, etc., at so much per house; A will provide all necessary materials, but not plant or scaffolding; the respective contractors will each engage what help they require. Kindly give your opinion on the following points:—1. Is A responsible for any claim if any of the workmen meet with an accident at his work on any of these buildings? 2. If so, to what extent, as a principal or otherwise? 3. Seeing that only the brickwork is let at per rod, which is commonly spoken of as piecework, would the liability, if any, be removed by letting the brickwork at per house?"

The answers to the questions above propounded depend upon S. 4 of the Workman's Compensation Act, 1906. To put the matter shortly, A is liable, subject to an indemnity. The Act provides that (1) where any principal . . . contracts with any contractor for the execution by or under the contractor of . . . part of any work undertaken by the principal, the principal shall be liable to pay if that workman had been immediately employed by him . . . (2) Where the principal is liable to pay compensation under this section, he shall be entitled to be indemnified by any person who would have been liable to pay compensation to the workman independently of this section, and all questions as to the right to and amount of any such indemnity shall in default of agreement be settled by arbitration under this act. The only exception to the liability prescribed by this section is contained in SS. (4), which is as follows:—"This section shall not apply in any case where the accident occurred elsewhere than on, or in, or about premises on which the principal has undertaken to execute the work, or which are otherwise under his control or management." It is thought that this sub-section would give but little relief to "Doubtful," inasmuch as the premises would clearly remain under his control and management. BARRISTER.

The committee promoting the erection of a memorial to the Pilgrim Fathers at Southampton have selected a design involving an estimated cost of £2,000. The scheme embraces the erection of a monument on the Western Shore, a corbelled projection in the form of the prow of a ship.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Sept. 1.	NEWBURN. Council Chamber Offices and Caretaker's house. The Newburn U.D. Council invite designs for these buildings to be erected in Newburn Lane, Newburn. Open only to Architects practising in Newcastle upon-Tyne and in the County of Northumberland. The author of the design considered the best will, subject to the general instructions and conditions of the competition, be employed to carry out the work. A premium of £10 will be awarded to the author of the design considered second in the order of merit. The Council has appointed Mr. Richard John Leeson, of the firm of Oliver, Leeson, and Wood, of Milburn House, Newcastle-upon-Tyne, architects, as assessor. A plan of the site and a copy of the general instructions and conditions of the competition may be obtained from George Wilkinson, Clerk to the Council, 1, Mosley Street, Newcastle-upon-Tyne, on payment of a deposit of One Guinea, which will be returned on receipt of a *bona fide* design, or if the plan of the site and copy of the general instructions and conditions are returned within 14 days with a notification of non-intention to compete. The designs are to be delivered at the Clerk's Office, No. 1, Mosley Street, Newcastle-upon-Tyne.
Oct. 1.	ABERDARE HOSPITAL. The Aberdare Urban District Council invite competitive designs for a fever hospital for 52 patients, including administrative block, outbuildings, etc. Premiums of £100, £50, and £25 for the designs placed first, second, and third respectively. An Architectural Assessor will be appointed on the nomination of the President of the Royal Institute of British Architects: also a Medical Assessor to act jointly. Particulars and conditions of the competition, together with a plan of the site, may be obtained from T. Phillips, clerk, Town Hall, Aberdare, on deposit of £3 3s.
Oct. 11.	HULL TRAINING COLLEGE for Teachers in Elementary schools. The Education Committee invites Architects to submit designs. Premiums of £150, £100, and £50 to authors of the designs placed 1st, 2nd, and 3rd respectively. Particulars and plan of site may be obtained of J. T. Riley, Secretary of Education, Albion St., Hull. Deposit, One Guinea, returnable on receipt of *bona fide* design, or the return of particulars within 14 days.
Nov. 30.	HERNE BAY PAVILION ON PIER. Herne Bay Urban District Council invite competitive drawings for a pavilion to be erected on the proposed extension of the pier at a total cost not exceeding £4,000, exclusive of architect's commission. Premiums of twenty-five guineas and ten guineas respectively will be awarded for such two designs as shall be judged of sufficient merit by the Council, and placed by them as first and second; the premium of twenty-five guineas to be afterwards merged into the usual commission payable to the architect, provided the work is carried out by such competitor. Plan of the site and copy of the conditions may be obtained on application to the undersigned on and after the 24th instant on payment of one guinea, which will be returned on receipt of a bona-fide design. Drawings to be deposited at the Clerk's Office, Town Hall, Herne Bay, not later than noon on the 30th November next.—Joseph Jubb, Clerk to the Council, Town Hall, Herne Bay.
No date.	NATIONAL MUSEUM OF WALES. The Council desires to receive competitive designs for the erection of a new National Museum at Cardiff. Three premiums are offered. The Council have appointed Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A., as Assessors. Particulars and plans of the site will be supplied to competitors on payment of a fee of £2 2s., which will be returned on receipt of a design in accordance with the conditions, or if all papers are returned within 14 days. Inquiries to be addressed to Dr. Wm. Evans Hovle, Director of the Museums, City Hall, Cardiff.

Builders' Notes.

Foreign Granite.

It is probable that the question of British versus foreign granite will be, like the poor, always with us. This vexed topic has been re-opened now that the Government is asking for tenders for the granite required at the Rosyth Naval base. The Scotch quarry owners on the last occasion quoted what were regarded as extravagant prices. As a result the contract went to Sweden, the price accepted being some £20,000 less than that demanded by the Scotch firms. There are reasons, considering the higher wages and shorter hours of British workmen, why these things should be; but it is doubtful whether the powers that be appreciate the significance of the situation.

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Germ-Killing Paint.

Nowadays most chemical inventions come from Germany; and it is not surprising, therefore, to learn that a new germicide paint has been invented at Chemnitz. It is called "Vitralin," and, in the report which has reached us, is said to have a basis of white lead or zinc white, or, in other words, is compounded on the lines of ordinary paint. The specific disinfectant property of "Vitralin" results from the oxidisation of the linseed oil, "which forms an important constituent of the paint. The bacilli of several forms of dangerous disease were brought in contact with it, and it was found that the germs of tuberculosis are completely destroyed in three days, while the germs of diphtheria went under in five hours, of typhoid fever in eight hours, and of pus in from six to thirteen hours." No lethal effect, however, could be observed upon the spores of anthrax, even when contact lasted 30 days, although a distinctly retarding influence upon the development of the spores was noticed.

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Fireproofing & Foolproofing.

The fatality at a cinematograph exhibition at Southsea lends point to the aphorism that while it is difficult to render a building fireproof, it is impossible to make it foolproof. It appears that a film flared up, but was promptly extinguished, and all would have been well but for a foolish cry of "Fire!" The assemblage consisted mainly of children, who at once became panic-stricken, and rushed for the doors, when, a baluster giving way under the severe pressure, a little boy was killed. Similar accidents have been very numerous, and it is hardly possible to suggest any practicable means by which they may be prevented. Where the crushes have been known to occur in passages or on staircases that were narrow or crooked or both, the remedy was obvious; but, seeing that people occasionally crowd each other to death in open streets and in large squares, it is obvious that the only possible means of preventing such calamities is less a matter of planning than of police.

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The Out-of-date Death-trap.

Without reference to the Southsea case, but speaking quite generally, it is to be feared that, in various provincial towns, there are many out-of-date buildings that, being used regularly or occasionally as places of public assembly, would become terrible death-traps in case of panic. The writer of this note was present the other evening at a small country theatre which a vigilant authority like the London County Council would instantly close. Built in the old pre-scientific days, it consisted largely of unprotected woodwork. The exits were few and narrow, and there were passages that seemed to have been very ingeniously planned with the express object of obstructing egress; and there was no evidence of a fireproof curtain. Although the theatre was filled to suffocation (and, by the way, means of ventilation seemed to be non-existent), the audience numbered only about 300 or so; but the tediously long time it took to filter out suggested the horrible conviction that if ever that theatre takes fire during a performance, there will be a repetition of some very ghastly history. As remarked in the immediately preceding note, it may be impossible to make a public building absolutely panic-proof; but, happily, it is possible, by the employment of modern methods, to ensure almost perfect immunity from fire; and the knowledge that these methods are rigorously insisted on, as they assuredly should be, by the responsible authorities, will go far towards extinguishing, at least among adults, the now too common tendency towards panic. People who have acquired confidence that a building is so constructed as to be but little likely to catch fire, that at the worst the fire would spread very slowly, and that the exits are plentiful and practicable, will not kill each other in a mad attempt to escape from death, and will not be greatly addicted to or readily influenced by either false or true alarms. It is the manifest duty of local authorities to establish this confidence by the strictest enforcement of the best-conceived regulations for protection against fire and panic. It is their duty to act on the knowledge that the "death-trap" building is out of date.

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"Building for all Time."

A correspondent of the "Liverpool Daily Post," writing under the suggestive cognomen of "Stonehenge," asks a pertinent question about the stone that is being used for the new cathedral. He asks for evidence "that the chemical and hydraulic tests applied prove the stone (red sandstone) to be one which actually hardened with the weather. Some," he says, "will be inclined to doubt that statement in face of the rapid efflorescence," noticed on other buildings in the city. The effect of the sea air, the various gases, and sulphurous fumes, I am afraid, will make one sceptical that any modern building is 'for all time.'" The preservation of our cathedral fanes is exacting unremitting care and vigilance; but their age and, in some cases, not very stable construction, are adequate excuse for the frequent repairs that are necessarily demanded. But if the air of Liverpool is already acting with deleterious effects upon recent buildings, it would seem to possess quite extraordinary potency. We prefer to believe that "Stonehenge" is of the numerous army of alarmists.

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The Belgian Builders' Visit.

The party of Belgian builders have, we hope, had an interesting and jovial holiday on our shores. Certainly the account of the London dinner, which we reported last week, and the particulars of their doings in Liverpool and Sheffield, which are given in another column, lead one to believe that our guests had a thoroughly good time, and that the way has been further paved for a better understanding between the British builders and their confreres of the Continental nations. The visit has not been without its humorous phases, one or two of which found their way into cold print. One story that is immensely rich concerns the two Yorkshire builders, unknown to each other, who commenced a conversation in "alleged French," each being under the impression that he was addressing a Belgian confrere. The mutual horror and disgust of the two when the inevitable mental tangle occurred, and one of them disclosed his nationality by regretting the absence of his dictionary, may be better imagined than described. Another little incident occurred on the steps of the Sheffield Town Hall, where a well-known local builder was asked what he thought of his own city, and was recommended to look at the new post office by some enthusiastic fellow-citizen who happened to be passing, and who hurried away before his victim could recover from his very natural amazement. These little incidents tend to the gaiety of nations, and we trust that they are not apocryphal, although they "come fra Sheffield."

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Small House Inspection.

The clause in the Housing and Town Planning Bill which provides for the inspection and registration of all small houses is to be strenuously opposed by the Association of Municipal Corporations. This inspection and registration, it is proposed, shall be carried out by the local authorities once in five years. Opposition is based on the ground that the authorities already possess powers in this direction, and any further enactment would only result in needless waste of the ratepayers' money. Mr. T. C. Horsfall writes to "The Manchester Guardian" drawing attention to the danger to the measure which the elimination of this clause would entail, and emphasising the importance and value of its application. With this sentiment we are in entire agreement. It is beyond question that numbers of people invest money in small property who are not fitted to hold it because their means will not allow of their keeping it in a proper state of repair. They live on the rentals until the property sinks in such a condition of dilapidation and want of repair that the sanitary officials condemn it and obtain a closing order. But though this may end the evil itself, it by no means checks the mischief which the existence of such property exercises upon its surroundings. Slums drive respectable people from property in the vicinity, and deteriorate an entire neighbourhood. The damage they inflict may be out of all proportion to their own value and extent. It is therefore a matter of some importance to see this clause retained; and from the builders' point of view it should be an advantage to have these periodical repairs and redecorations carried out. The speculative builder, too, may suffer loss in the development of an estate if the first houses built and sold by him are in the hands of small landlords, who allow the property to go to rack and ruin to the detriment of the new dwellings he is erecting. Mr. Horsfall does not hesitate to say that while some cases of bad housing may be attributed to the negligence of owners, very many are due to the bad habits of wilfully careless and destructive tenants, upon whom this periodical inspection would prove a wholesome check. The system of inspection of all small dwellings is now in use in Hamburg, Lubeck, Hessen, Alsace-Lorraine, Saxony, Baden, Bavaria, Wurtemberg, and in the Rhine Province of Prussia. Wherever it has been tried it has been found to be the necessary foundation for a really effective attack on bad housing. The following statement respecting the results obtained in Dresden fairly represents the tenor of the annual reports issued in all the towns and states which are named:—"The last report on the inspection of dwellings in Dresden is also very encouraging. Dresden has 136 000 dwellings and over 400,000 inhabitants. There are twelve inspectors of dwellings. Ground plans of all the houses have been prepared, and in future examinations of all the dwellings can easily be completed in about six months. The inspectors report that inspection is more and more welcomed, both by landlords and tenants, and the inspectors receive more and more requests for their intervention, advice, and suggestions. It is their object to be regarded as friends and advisers rather than as police officials. They report that, while many of the dwellings are too small, most of them were clean, and that only five dwellings had to be emptied on account of lack of cleanliness. In all other cases, when some want of cleanliness was objected to, improvement was effected without delay."

The Age and the Style. Mediæval architecture is based on the idea of vertical expansion, classic architecture on the idea of lateral expansion. The desire of the one is to rush up: of the other is to spread. Can we say that the tendencies of architecture stand for certain tendencies in human nature? Yes, on the whole, is the answer. The Middle Age, with its love of action and belief in its all-sufficiency, is the time of the birth of pointed architecture. Chivalry and romance, poetry, the Crusading frenzy, and Gothic architecture, one after the other, emanated from France—the impulse, that is, to consecrate and idealise a love of action; indealised energy, in fact. Gothic architecture was the typical child of the mediæval age, an age poor in thought and rich in energy. And Gothic architecture must therefore have the defects of its age. Only what can be got out of life can be put into art. The energy which characterises mediæval life we find in the architecture. If lack of thought equally characterises that life, we shall find that in the architecture, too. The Doric temple, the laterally expanding in style, the supreme example of horizontal architecture, is essentially the product of an age of thought, of an age just as fully charged with thought as the mediæval age is charged with energy. Classic architecture, as developed under Rome, had many bad qualities, but one fine quality—its spacious and ample proportions: proportions in which are measured for us the qualities of the classic mind and which produce upon us something of the same calming effect which contact with the classic mind itself produces. The connection between spaciousness in architecture and a free play of the mind is still more plainly shown by the Italian Renaissance. In fact, we shall find that the accessibility or inaccessibility of various parts of Europe at various times to ideas is measured for us in the readiness of architecture in those parts to expand, or in its refusal to expand. Why is early Victorian art a bye-word—not of that which is good? After the French Revolution England was thrown violently back upon herself; she distrusted France, always receptive of ideas, more than ever; she contracted, as it were, and her insular prejudices and limitations reasserted themselves with vigour. This isolation took effect in many ways. It showed itself in the dullness and ponderous self-satisfaction of early Victorian society and early Victorian art. It showed itself, even, in the nature of the revolt against that dullness, a revolt which, far from interesting itself in contemporary European life and thought, busied itself in the resuscitation of our own dead ideals and in the mournful retrospection of the pre-Raphaelites. But, above all, this isolation, this severance from the life and thought of Europe showed itself in a passionate revival of Gothic architecture.

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A Simple Test for Mortar. The following is said to be a useful test as to the quality of mortar:—A large pat of the mortar is placed on a clean shovel, the latter being held at a sharp angle so that the mortar may slowly slide down it. If the material is of good quality the metal will be covered all over the portions previously covered by the mortar with a whitish slime. If lumps remain on the shovel after most of the mortar has slid off, too little water has been used in the mixture. If, on the contrary, the shovel is covered with a film of dirty water and the mortar slides off too quickly, it is a sign that too much water is present—the mortar has been mixed too soft. Irregularly distributed white spots suggest that too little lime has been used, or that the mixing is defective. Very soft, easily spread lumps in the mortar indicate a lack of sand, but brittle portions show that more lime or lime and water is needed. Obviously this test demands considerable practical experience, and even then depends overmuch on the personal judgment of the man who makes it. Such rough-and-ready tests, however, are often valuable as being the means of bringing the operator's experience and judgment to a focus, or of concentrating his energies upon particular points. For this reason, if for no other, crude rule-of-thumb methods ought not to be lightly despised. They fix the attention in much the same way as in the case of the youthful Walter Scott, who could never recite his lesson unless he could at the same time fumble with a button.

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Science and the Builder. That the common fund of knowledge of stresses and strains is by no means perfect needs no proof, and the need for amplifying it has been rather forcibly indicated by recent bridge failures, such as that at Quebec, and hardly less strikingly by the frank confessions by engineers of their ignorance on certain points that have only recently assumed practical importance. There is an urgent demand for data derived from actual experiment—as to the different effects, for instance, of various moving loads—and from careful observation of the effects of natural influences—wind, sun, heat, frost, etc. Concerning all these matters, and perhaps some others, the old data need revision and amplification, and it is not impossible that, in the course of properly conducted investigation, further facts and phenomena could be deduced or discovered. Such investigations should not be left to voluntary effort and private endeavour. Now that our universities are devoting more attention to scientific work, it may be anticipated that the experiments in which they engage will not be confined to barren repetitions of what has been already ascertained and established, but rather that they will partake more largely of the character of independent research, so that the recently widened gap between theory and practice may be reduced or bridged. With regard to loads, it is plain that this is a matter which closely concerns not only the engineer and the builder of bridges, but also the architect and the builder of warehouses, and other large structures in which modern methods are adopted. In this respect the conclusions that are to be, and doubtless soon will be, established, are likely to make for economy rather than for safety—that is to say, they will make for both, although since it is known that the present conditions err on the side of safety, the most valuable achievements in research may be expected to arise from demonstrable proofs that this essential object can be assured with less expenditure on labour and materials. The investigators will renew, on scientific lines, the ancient and inevitable quest of efficiency with economy. They cannot do it quite adequately, however, with the necessarily limited means afforded by the institution workshops and class-rooms. If science is to be really helpful to the builder, the builder must be really helpful to science. This he can be, without incurring much inconvenience, by affording facilities for the inspection of works in progress, and by referring interesting practical problems to the consideration of the trained and accredited expert.

THE WHITGIFT HOSPITAL CONTROVERSY.

Mr. John Burns, who, as President of the Local Government Board, may refuse to grant Croydon Town Council the powers to enable them to carry out improvements which would involve the destruction of the Whitgift Hospital, has paid a visit to the spot, and it is stated that, while his love of ancient buildings is well known, he favours the suggestion that the corporation should take the opinion of the ratepayers as to whether or not the hospital shall be cleared away. The Mayor of Croydon has stated that he and his supporters do not desire the destruction of the building, which, however, is situated in the busiest part of Croydon, in such a position as to prevent the widening and straightening of the main street. The Mayor sees no reason why the almshouses could not be pulled down, and re-erected on a more convenient site.

A curious compromise has been suggested by a correspondent to a morning newspaper. "He," says the 'Evening News,' "would settle the question by allowing the new road to cut off as much of the hospital as may be necessary. The demolished portion, he complains, might be set up somewhere else. 'Would not this,' he asks, 'meet the reasonable wishes of all concerned?' Now," comments our evening contemporary, "it is not a fact that the work of Elizebethan builders can be moved as easily as a galvanised iron cricket pavilion. But the peacemaker may be told that the peculiar beauty of the Whitgift Hospital does not lie in its bricks, which are very like any other ancient bricks. The beauty is there because the bricks were built up in the form of an Elizabethan house, enclosing a square garden court. Traffic at Charing Cross might be improved if we were to cut off the hind legs of Charles's horse, with their share of the stone pedestal. But even if we found room in Finsbury Square for the detached portion, there would be æsthetic and sentimental objections to the arrangement. We trust that we have now explained to the peacemaker why his Croydon plan would not 'meet the reasonable wishes of all concerned.'"

This compromise will not work. If there is to be a compromise at all, it may possibly be that suggested by active members of the Committee for the Survey of the Memorials of Greater London, who, we understand, point out that the requirements of the case might be met by continuing round the angle into North End the existing passage between hospital and the buildings adjoining it on the east, when a slight widening of the south side of the street would give sufficient space for the traffic. If the issue is to be decided by popular vote, we can only trust that the people of Croydon will make a right use of their opportunity for showing that they are not destitute of veneration and true taste. We admitted, last week, that there is some force in the argument that the hospital is obstructive to street widening. This situation, however, has been created by the local authorities, who, from time to time, have sanctioned street plans that have gradually led up to the present position of affairs. The result could hardly have been more effectual if, from the outset, the scheme had been conceived with the deliberate intention of making the removal of the hospital imperative. It remains for the people of Croydon to show that they have more veneration than their rulers.

A large factory has recently been erected in Pixmore Avenue Letchworth, for Messrs. Kinora, Ltd., Photographic Film and Hand Camera Manufacturers. The building is 120ft. long by 110ft. wide, and the front and side walls are built of Fletton bricks, the back being of corrugated iron sheeting, in order to allow of extension at some future time. The brickwork of the front walls is plastered, and is relieved by a base, pilasters, string course, and coping of local red pressed bricks. The roof is divided into five bays of sawtooth pitch, and is formed of steel trusses, supported in the interior of the building on girders and stanchions. The north sides of the bays are glazed with ¼in. patent rolled plate, and the other sides are boarded and tiled. The interior is divided by brick partitions into rooms to suit the requirements of the firm. The steel work was supplied by Messrs. Edward Wood and Co., Manchester. The roof glazing was supplied and fixed by Messrs. Henry Hope and Co., 51, Lionel Street, Birmingham, and the plastering was executed by Mr. J. Coleman, Letchworth. The whole of the other work, including the erection of the steelwork was carried out by the workmen of the First Garden City, Ltd., under the superintendence of Mr. W. G. Satchell, works manager. The factory was designed by Mr. H. Burr, surveyor to the First Garden City, Ltd.

RECENT CHANGES IN BRICKMAKING.

By Alfred B. Searle.

Although it is more than half a century since the first brickmaking machine was introduced in this country, the majority of brickmakers to-day still adopt the old-fashioned method of hand-moulding, which has been passed down from one generation to another for many generations. At the same time the majority of the bricks made in recent years have been produced by machinery.

These apparently contradictory statements are not really so divergent as they appear to be at first sight, as "the majority of brickmakers" include a large number of small yards of very limited local influence, whilst the "majority of bricks" include those produced by some of the yards which are large enough to turn out twenty times as many bricks as some of the smaller works.

The Ancient Simple Method.

It is interesting, on a holiday or other times, in visiting old brickyards, to notice how remarkably small is the change between them and the ancient brickyards of the middle ages. It is only when one is in the neighbourhood of a large town that the progress made during the last fifty years becomes appreciable and the value of the machinery to the brickmaker becomes apparent.

The simplest method of making bricks, and therefore the one most adapted to very small yards, such as are seen in out-of-the-way places, or where the amount of clay to be won is exceedingly limited, is the method of hand-moulding. For this it is usually necessary to have a clay which when dug is of such a nature as to form a suitable paste on mixing it with water in a pug-mill. In the smaller yards this mill is worked by a horse walking in a circular track, in a manner similar to the ancient chaff-cutter. The paste so produced is similar in appearance to mortar, but rather stiffer. It is made into bricks by the moulder taking up a sufficiently large lump and throwing it with great force into a prepared wooden mould, scraping off any excess of clay with a wooden straight-edge, and turning out the contents of the mould on to a board or on to a floor.

The mould is prepared in either of two ways—it may be covered with sand, or it may be dipped in water. The object of the sand and water is to prevent the clay from adhering to the mould when it is desired to turn out the brick

The brick, if placed on a board, is carried by a boy to a barrow or to the drying floor. Formerly, bricks were, as they are to a large extent at the present day, dried out of doors, being arranged in low walls about eight or nine bricks high, the bricks being set very openly. To keep off the rain and to protect them from too direct an action of the sun, they are covered with small gables made of wood, and sideboards or mats are also used to protect them. The more modern method, however, is to dry the bricks by artificial heat, either on a steam or flue-heated floor, or in a series of heated tunnels, through which the bricks are run on special cars. Many patents have been taken out for the use of artificial heat in drying bricks, but even now no arrangement has been found which will be equally satisfactory in all cases.

On the whole, artificial drying is the cheapest, but it requires the outlay of a considerable amount of capital, so that, for this reason alone, many brickmakers are compelled to continue using the less satisfactory method of drying in the open air on hacks.

Hand Pressing.

When bricks of a specially good shape are needed, the hand-made brick must be pressed, usually in a press worked by hand and of a portable pattern, so that it can be taken to different parts of the drying ground, as the bricks must be pressed before they are quite hard.

A method of burning which has been handed down from very early times, and is still used for the manufacture of London stocks, is to use what are known as clamps. These are structures built of the bricks to be burned, the bricks being so arranged that when once the clamp is lit it needs no further attention, but burns steadily on till the firing is complete. The fuel is supplied partly in the form of sifted cinder dust, which is mixed with the clay, and partly from larger cinders (breeze), which is placed in one or more layers in the clamp. When once thoroughly heated by the burning breeze, each brick becomes a sort of fire-ball, on account of the combustible matter it contains, and so needs no attention in the burning. Unfortunately this method is only applicable to certain classes of bricks, and most modern bricks are now burned in kilns.

Early Machinery.

One of the earliest pieces of machinery used for brickmaking consisted in forcing the paste into a mould so as to fill the latter, and then pressing it by means of a descending plunger. This method proved to be very slow, and had many disadvantages which required much ingenuity to overcome; though it was finally discovered that the use of a much stiffer clay paste than that ordinarily used made this process into a commercially satisfactory one, and it is now

used in many yards under the term of the "stiff-plastic process."

Another step forward was made by the use of a horizontal instead of a vertical mixer or pug-mill, driven by mechanical power, which produced a more complete mixture and in much larger quantities than when a horse was used, and it was not long after this that a die was fixed to the mouth of the pug-mill so that the clay issuing from the machine might be in the shape of a number of bricks laid side by side. This clay band is cut into strips of suitable length, and each of these strips is then cut into a number of separate bricks, which are then taken away to be dried. As the cutting is usually done by wire stretched on a frame, this process is commonly known as the wire-cut process, and the bricks as wire-cuts. Such bricks are usually better in shape than simple hand-moulded bricks, but otherwise resemble them in many ways. If the wires are not carefully watched, the bricks will have rough arrises; but the process is so simple, and is capable of turning out so many bricks, that it has become exceedingly popular, though the bricks are not so accurately shaped as those made by the stiff-plastic process, or as others to be described later, in which a press is used and each brick is moulded.

Semi-dry Dry Process.

The addition of water to clay in order to convert it into a plastic paste, and the necessity of removing this water before the brick could be sent to the kiln, have been considered by many people to be a great waste of time and money. A deeper knowledge and a wider experience of most British clays would soon convince them of the error of their judgment in most instances, but there are certain clays which can be worked satisfactorily without first being converted into a paste, and these may be treated by the semi-dry or dry process. These processes are only suitable for certain materials, chiefly of the shale class, in which it is not possible to develop more than a limited amount of plasticity. Such materials are ground to powder, placed in powerful mechanical presses, and formed into bricks which contain so little moisture that they may be taken direct from the machine to the kiln, and the labour of pugging and drying avoided. The best known bricks of this type are those made at Fletton, near Peterborough, but other districts in which suitable materials are found also produce similar bricks, as at Accrington, in Lancashire.

As the clay possesses but little plasticity, it is necessary to use great force in the compression, and in some cases as many as four separate pressures are considered essential to bind the particles firmly together.

Benefits of Machinery.

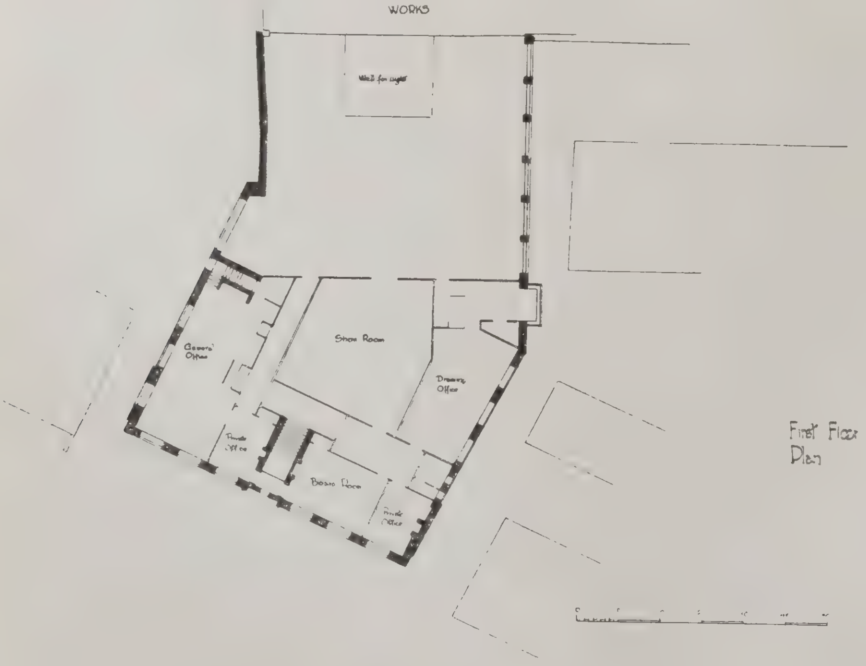
One of the greatest benefits resulting from the introduction of machinery to the brickmaking industry is the much larger range of raw materials which it is now possible to use. Formerly it was only those clays which could be made into a plastic paste with comparatively little trouble that could be employed; but, with modern methods of crushing, grinding and mixing, it is now possible, and in many instances preferable, to use materials which could not be employed before.

The strong plastic clays used for hand brickmaking are always troublesome to dry, and must usually be mixed with some non-plastic material to prevent their shrinking excessively in the kiln. As a plentiful supply of sand or other non-plastic material is seldom found in the neighbourhood of such clays, the sources of suitable material are still further restricted unless machinery is employed. Many shales and other hard materials are really in the nature of clays which have been compressed by natural agencies, and if these can have the effects of the compression destroyed to a sufficient extent to enable good bricks to be made from them, they will often be found to possess distinct advantages over the more plastic clays. It is in the utilisation of these materials that the greatest progress has been made in modern clayworking, and it is in connection with this class of bricks that the greatest changes in the methods of manufacture have been necessary.

Crushing Plant.

No modern brick plant of large capacity would now be considered complete without a crushing plant, consisting of crushing rolls with or without an edge runner mill; and in some cases, where the materials are particularly difficult, as many as three pairs of rolls and two edge runner mills, in addition to the brick-shaping machine, are used.

Yet, although the use of machinery for preparing the clay has brought about great changes in the methods of manufacture, it is probable that the changes in the kilns used have been of equal, if not of greater, importance.



NEW PREMISES FOR MESSRS. DRONSFIELD BROS., OLDHAM. J. HENRY SELLERS, ARCHITECT.

The front of the building is glazed with dull green glazed bricks. The dressings are of polished granite. The whole of the general offices and drawing office are lined with tiles. The private offices and board-rooms are panelled in teak.

Kiln Burning.

Formerly, when kilns were used at all, they consisted of comparatively small chambers heated by a series of fires, the greater part of the heat produced being lost in the chimney. The bricks so made were in many instances baked rather than burned; and yet, in spite of their being what would nowadays be termed under-fired, an average coal consumption of 10cwt. per thousand bricks was considered normal. Now it is thought extravagant to use more than 5cwt. of coal for a thousand bricks, except in very small yards, which cannot avail themselves of modern advantages owing to their limited output. With some shales it is even possible to use less than ½cwt. of fuel!

This great reduction in the cost of burning has been brought about through the introduction into this country of a German kiln, designed by Frederick Hoffmann, in which the heat from one set of bricks was utilised to heat up other sets, and the loss of heat thus reduced to a minimum. Unfortunately, the original Hoffmann kiln was only suitable for the production of common bricks, as the fuel being distributed amongst the goods caused irregular heating and spoiled the colour, unless exceptionally skilled burners were employed. Within the past few years this difficulty of inferior colour has been completely overcome, and bricks of perfect colour, hardness, and strength can now be burned with as little fuel as is generally thought to be possible only with the commonest bircks. The speed at which the burning is conducted has increased with great rapidity of late, though we are still a long way behind some of the German brickmakers in this respect.

Most single kilns require several days to get up to the heat required for finishing the bricks, as the temperature must be raised very gradually or the bricks will twist or crack.

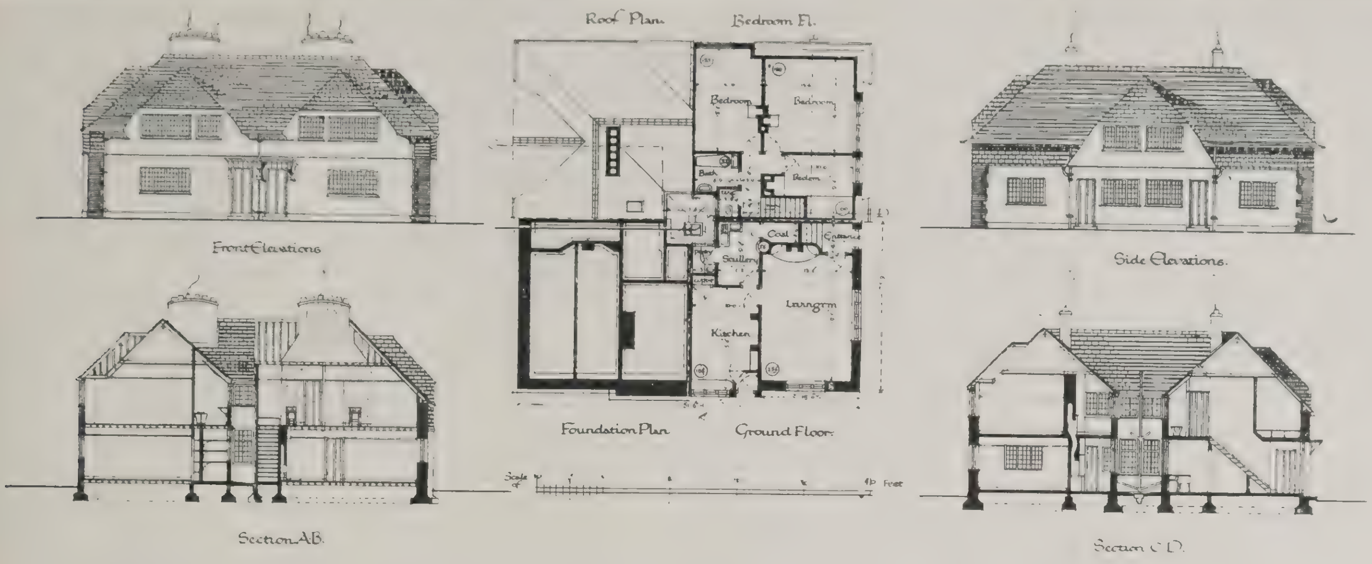
In a continuous kiln they may take almost as long; but the speed of the fire may be increased enormously if proper arrangements are made and the output is sufficiently large. This is possible because in a continuous kiln the bricks are continually being put in and taken out, and the fire travels round and round and never goes out as in a single kiln, the temperature being raised in a perfectly steady and regular manner at any desired rate.

The usual practice amongst British brickmakers is to allow the fire in a continuous kiln to travel at the rate of about 12ft. to 16ft. in twenty-four hours, but this is far slower than need be the case if the kiln is properly designed. Many firms using continuous kilns have not, however, departed noticeably from the original Hoffmann design, except to lengthen the kiln somewhat. By re-arranging the chambers, making them narrower and longer, it is easily possible, with clays that are not too plastic or dense, to allow the fire to travel at the rate of 128ft. per day of twenty-four hours. This wonderful speed is maintained in quite a number of German and Swiss works, but, so far as the writer is aware, only one English yard permits a fire speed of 100ft. per day.

Advantages of Rapid Firing.

So rapid a rate of firing has several advantages besides that of greater output, as the losses by radiation are reduced, and in various other ways fuel is saved and a better class of goods is obtained. At present, unfortunately, it is not possible to produce goods of the best colour at this rapid rate; but as English kiln builders continue to improve their designs, there is but little doubt that within a few years the average speed of kiln firing will be greatly increased. This is the more probable, as it is not difficult to alter many existing kilns so as to secure a more rapid travel of the fire.

The secret lies, as already indicated, in the use of exceedingly long chambers before and behind the bricks under fire, so that the cooling and heating may be carried out



DESIGN FOR A BLOCK OF FOUR COTTAGES ARRANGED AROUND A CENTRAL WELL. ANDREW MUIR, ARCHITECT.

This design is worked out on the idea that a square enclosure is the cheapest to build, and four squares grouped together give the greatest area of ground between groups. The rooms are worked to make the length equal the diagonal of the breadth, and are kept as low as possible. The windows to the well would be obscured, and one pantry would have a French or casement window to give access for cleaning, etc. We invite criticism of this design as to its practicability and saving of space.

steadily. To attempt to increase the speed of travel without altering present kilns would result in failure.

Kiln and Boiler Fans.

The brick chimney has for many years been a useful landmark by which the stranger might identify the works, but the use of fans for producing the necessary draught in kilns and boilers is increasing steadily, and constitutes another recent change in the manufacture of bricks. When a fan is used, the manufacturer finds that he not only has a much better control over the working of his kiln, but that he has a large amount of hot gas available from the boiler furnace, and this can be utilised in various ways for drying, etc. In the ordinary kiln with a chimney, the burner must depend to a large extent on the weather, as in winter the draught is different from that in summer, and a heavy shower of rain greatly diminishes the drawing power of the chimney. All these disadvantages result in an irregular working of the fires in the kiln, and tend to spoil the product or to make its quality less regular than it would be if the draught were under better control. Further than this, the use of fans enables the burner to have plenty of draught at his disposal, and he is therefore able to make more use of hot air and other by-products of his kiln than when he is dependent upon a chimney.

The objections sometimes raised against fans are not so serious as conservative brickmakers often suppose, and a careful and unbiassed study of the subject will clearly show their advantages in many cases, though in certain works where the output is small and the chimney draught ample, no purpose would be served by the introduction of a fan.

Transporting Clay and Bricks.

Nothing is more astonishing to the experienced brickmaker in a country yard than the great changes which have taken place in the means used for transporting clay and bricks. Formerly the wheelbarrow was the chief means employed for moving the clay, and this is still used in small yards and under certain conditions. In the larger yards the barrow has been largely, if not entirely, replaced by small cars or waggons running on a railway track and drawn by horses, ropes, or chains. In a few yards, overhead ropeways are erected, the material being carried in buckets suspended from an overhead rope. This method is particularly convenient when the clay pit is separated from the works by one or more fields or by a river, or where intermediate objects prevent a direct tramline being laid.

Clay Getting.

The manner in which the clay is mined has also undergone a series of remarkable changes during the last quarter of a century. The pick and spade are still used where the clay is of a variable character and needs careful selection, but most yards now use some kind of blasting powder to break down large quantities of material at a time, so that they may be loaded direct into the waggons. In some of the largest brickyards, where the clay deposit admits it, the material is dug by powerful steam excavators, which will dig a ton of material at a single stroke. Where these can be used, the cost of getting the clay is reduced to less than a quarter of its former figure.

In short, the brickmaking business has undergone not one but many revolutionary changes within recent years, those just mentioned by no means exhausting the list.

NOTES ON PAINTING AND DECORATION.

At a recent meeting of the Royal Institute of British Architects, a member appeared to throw cold water on the efforts that are to be made through a section of the Science Committee to produce a standard of quality for materials used in the preparation of paints. Yet the work undertaken is of a most important character, both to architects and their clients.

* * *

Doubtless it will take a great deal of time to investigate all the materials used in paint-making; but if only the most important are dealt with at first, even this approach to the subject will be of very decided advantage. The fact is that architects as a body know less about paints than they do about any other material used in building. It is perhaps natural that this should be so, because practically every other material enters into the construction of the building, whereas paint is added only either to beautify or to preserve. If the concrete, the bricks, or the stone used in a structure are inferior, the fabric suffers from the begining; but if the paint is bad, the only serious consequence is that repainting becomes necessary in a shorter time than would otherwise be the case.

* * *

Many architects appear to think that so long as pure white lead, pure linseed oil, and pure turpentine are used in a paint, they are absolutely safe. But what is pure white lead? It is only a few years since it was decided in a law court that sulphate of lead might properly be sold as white lead, although for centuries hydro-carbonate of lead has always been recognised as white lead proper. And, assuming that the lead is pure hydro-carbonate, it may yet be so coarsely ground as to yield a very bad paint indeed.

It is true that in the case of certain colours such as the lakes, Brunswick green, etc., it would be very difficult indeed to form a standard; but, on the other hand, many colours are quite definite in their composition, as, for example, chrome yellow, which is pure chromate of lead. One might give many similar instances. Then, again, as to linseed oil, there is a wide difference in quality, even among those oils which have not been purposely adulterated. The use here of the word "purposely" needs a little explanation.

* * *

The system of producing the oil by cooking the flax seed, expressing the oil under heavy hydraulic presses, and the subsequent refining, is practically the same at all mills; but in one important particular there may be a vast difference. In a few cases the seed is prepared for crushing just as it comes off the barges, and in not a few instances this seed is small and unripe. In the best mills, however, the seed is screened three times, and it is an "eye-opener" to see the large quantity of dust, dirt, and foreign seed—mustard, hemp, etc.—that is thus extracted. Comparing these two cases, can one say that no standard is required for oil?

* * *

With regard to turpentine, the high prices which prevailed about a year ago caused all sorts of adulterated goods to be put on the market, while it brought about the production of many substitutes, some of which may be used instead of American turps, and are literally "just as good." As a matter of fact, benzine may be employed instead of turpentine without bad effects, excepting for flatted work, when it will be found to evaporate so quickly as to give rise to unsightly laps.

* * *

The Science Committee of the R.I.B.A. have, therefore, in the paint question, a subject which has needed attention for many years past. The hope is that they will not get discouraged because of the immense amount of facts they will be compelled to get together. J.

The Circular Railway, which serves some portions of Berlin and its suburbs, was the scene of a curious accident on August 19th. An iron tower, 280ft. high, situated on the premises of the Imperial Gas Company, at Schöneberg, which are skirted by the line, collapsed just as a train was passing by. A quantity of the wreckage fell on to the last compartment of the train, causing injuries to a number of passengers. None were killed.

In Parliament.

By our Gallery Representative.

Structural Alterations to Burlington House.

Mr. Courthope asked the First Commissioner of Works what was the original cost of Burlington House; and what sums had subsequently been expended on structural and other alterations to this building.

Mr. Harcourt: The total cost of the block of buildings known as Burlington House, now occupied by the Royal Academy, the Learned Societies, and the Civil Service Commission, was £435,212. The trustees are responsible for the cost of all repairs to the portion occupied by the Royal Academy. There has been no charge on public funds on account of structural alterations to the portion occupied by the learned societies. Various alterations were executed for the London University at a cost of £4,051, including fittings, etc., and upon the transfer of that part of the building to the Civil Service Commission the works of adaptation cost £14,016.

An Irish College System Postponed.

Mr. T. W. Russell informed Mr. John O'Donnell that in June, 1907, a sum of £10,000 was provisionally allocated by the Irish Department of Agriculture for the erection of an agricultural college at Athenry. Owing to the unsettled state of the district, action in regard to the expenditure of this money was indefinitely postponed, and the Department were unable to say when, if ever, any portion of the said sum would be expended for the purpose for which it was allocated.

Labour Exchange Buildings.

Mr. Claude Hay desired information from the First Commissioner of Works as to the expenditure of £9,339 for providing buildings under the Labour Exchanges Bill during the next eight months.

Mr. Harcourt replied that the total estimated cost of staff was £7,839, made up as follows:—Professional assistance, including architectural and engineering assistants and draughtsmen, £6,767; technical assistance for furniture, £360; seven second division clerks, £370; four assistant clerks, £170; two female typists, £85; one shorthand writer, £87; total, £7,839. The balance of £1,500, making up the total estimate of £9,339, was in respect of travelling expenses. Mr. Harcourt added, in reply to another question, that it would not be in the public interest to state the items comprised in the sum of £4,500 to be voted for renting buildings, etc., for labour exchanges.

Trafford Park Improvements.

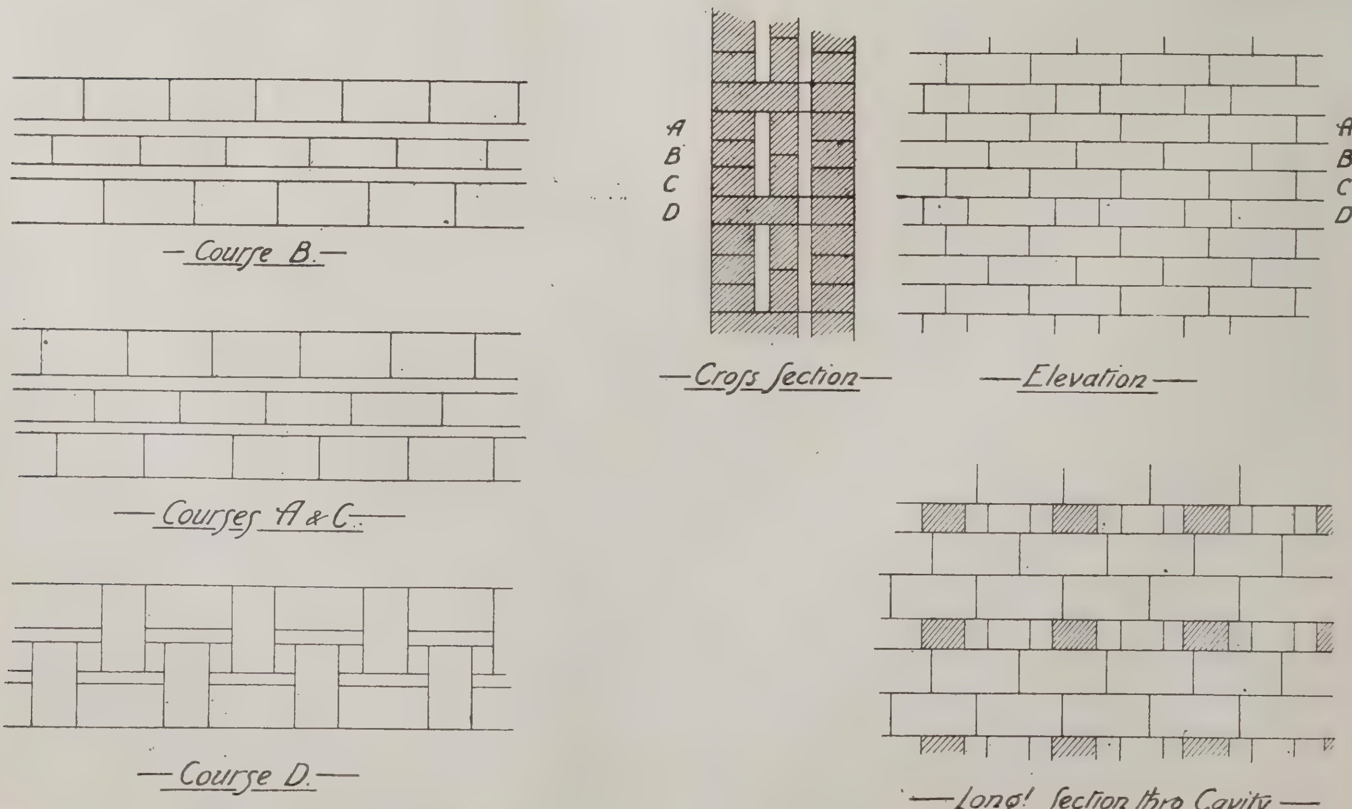
Mr. Joynson-Hicks asked the Chancellor of the Exchequer whether he was aware that about £250,000 had been spent in the preparation of Trafford Park for development, little of which sum would obtain exemption as roads or sewers under Clause 10 of the Finance Bill; and, if so, what steps he proposed to take to prevent such estate incurring the undeveloped land tax, in view of the terms of Clause 10 as now amended. Mr. Hobhouse replied: "I may remind the hon. member that under Clause 14, subsection 4 (a), the Commissioners are to allow, as deductions from the site value of any land, any part of the value which is proved to be directly attributable to works executed for the purpose of improving the value of the land as building land or for any business, trade, or industry other than agriculture." Mr. Joynson-Hicks asked if the hon. gentleman was aware that, according to the amendment made in Clause 10 last week, the exemption was limited to expenditure made within 10 years, and that the bulk of the Trafford Park improvements would not fall within that period. Mr. Hobhouse replied: "No sir, I am not aware of that. I am informed that the deduction which I mentioned under Clause 14 practically relieved the Trafford Park estate of all that of which it is entitled to be relieved."

Building Bills Abandoned.

The "Massacre of the Innocents" announced by the Prime Minister last Friday is fatal to the Buildings and Engineering Works Bill, to the Check-weighing Bill, and to the London Electric Supply Bill. The Government, however, is to proceed with the Housing and Town Planning Bill, the House-letting (Scotland) Bill, and the Electric Lighting Acts Amendment Bill.

The foundations of a villa, indubitably Roman, have been discovered in the marshes adjoining the new Ebbsfleet Pleasure Ground recently opened at Northfleet, and little more than a stone's throw from the confines of the flint field, the treasures of which are not yet exhausted. Already the typical rough red tile pavements have been uncovered, and a quantity of pottery and vases have been discovered, together with a Roman well some 12ft deep. The land is the property of the Associated Portland Cement Manufacturers (Limited), who are excavating chalk there, but to further the cause of antiquarian knowledge the covering earth is being carefully removed by a skilled workman under supervision. The discovery is of great antiquarian interest, as there is every reason to believe that innumerable Roman remains are buried in this part of Kent. The nomenclature of the surrounding district points strongly to extensive settlements of the Ancient Britons and the Danes. Watling Street passes through the woods higher up the hill not more than half a mile distant, and Roman stations are known to have existed at Southfleet and at Springhead. In the time of the Romans a creek, which ran from the river to Swanscombe, was navigable, and this may account for the prevalence of Roman remains, the value of which has been so greatly increased by the discovery of the Roman station or settlement.

Suggestion for 15" Double Cavity Wall.



—Course B.—

—Courses A & C.—

—Course D.—

—Cross Section—

—Elevation—

—Long! Section thro Cavity—

BY FRANK B. DUNKERLEY, F.R.I.B.A.

Works in Progress and Completed.

ALBURY.—The church of St. Mary, a very ancient edifice situated on high ground overlooking the valley of the Ash rivulet, has recently been undergoing restoration, the chancel having received the most careful attention. The church is built of flint with stone dressings in the Early English style of Gothic architecture, and probably dates from the earliest part of the thirteenth century. The church consists of chancel, nave, aisles, south porch, and an embattled western tower containing three bells. The sum of £3,000 has been devoted to the work of restoration, which has been carried out under the supervision of an eminent ecclesiastical architect, Mr. W. J. Parker.

ALTRINCHAM.—The new extension of the public baths which were originally designed by Messrs G. Worthington and Sons, of Manchester, was opened recently. The addition has been designed by Mr. Percy L. Lodge, of Manchester, and has been erected at a cost of £4,500. The total cost of the building now amounts to £10,000.

ANNATHILL.—A new school of the central hall type, to accommodate 300 children, has been opened here. Ample room has been allowed for future extension.

ATTERCLIFFE.—The work of restoring the old chapel at Attercliffe with a view to using it as a mission station is now far advanced. All the old features of the ancient structure have been retained, this being specially kept in view by the architect, Mr. Webster. The builders are Messrs. James Fidler and Sons.

BOLTON.—The erection of the new church of St. Philip's, which, including the boundary wall, is estimated to cost £5,000, is now proceeding. The site provides for a church, a school, and a vicarage, and has cost £2,000. Accommodation will be provided for about 550 worshippers in the church, which is the only part of the scheme at present contemplated. The builder is Mr. R. J. Tyson, of this town.

CROMER.—The foundation stone of a new Wesleyan Church to be erected here, has been laid. The church, which will consist of a nave and transepts, is the design of Mr. A. F. Scott. The total cost of the building will approximate £4,000. Mr. Herbert Bullen is the contractor.

DUNDEE.—The new central reading room which is to be erected shortly from the designs of Mr. James Thomson, the city architect, is the gift of Mr. Andrew Carnegie, and will involve a sum of £37,000. The site has been given by Sir William Ogilvy Dalgleish, Bart. The building is in the English Renaissance style, and is crowned by a dome, rising to a height of nearly 100ft., at the base of which sculptured figures representing literature, art, science, and sculpture, are placed. The list of contractors is as follows:—Mason work, D. K. Symington, Dundee; steel work, Fleming Bros., Glasgow; joiner work, John Stewart and Sons, Dundee; painter work, Allan Boath, Dundee; plumber work, J. Farquharson and Sons, Dundee; slater work, Chas. Brand, Dundee; glazier work, Donald and Smith, Dundee; heating, David Keay, Dundee; fittings, Geo. C. Aimer and Son, Dundee; plaster work, Alexander Reoch, Dundee; electric installation, Maxwell, Son, and Co., Dundee.

FLEETWOOD.—The new Empire Theatre and Hippodrome, which was opened recently, is built externally of imitation Carrara marble. The total seating accommodation of the building is 800, of which number, ninety are disposed of by the grand circle. The theatre has been erected according to the plans prepared by Mr. Albert Winstanley, of Manchester, and St. Annes.

HALIFAX.—The new church of St. Hilda's now in course of erection, will accommodate 600 persons, and is to cost £6 484, exclusive of the land, which has been bought for £350. The amount in hand or promised is £4,605 7s., including £1,000 each from Diocesan Societies, Mr. J. T. Ramsden, and the Sanderson Trust, £500 from the Halifax Church Extension Society, and £200 from the Church Building Society.

KESWICK.—A Rochdale cotton spinner has initiated a scheme for the erection of artisan cottages on the garden city plan at Keswick. Tenders have already been accepted for the building of 23 houses, the rents of which will vary from £10 to £25. The scheme will cost £4,000.

LEIGH.—The foundation stone of a new Congregational Church was recently laid. The new buildings, which replace an old iron structure, will cost £5,000.

LONDON.—It is stated that on October 1 the Lord Mayor will open the new Technical College in Tower Bridge Road, which the generosity of the Leathersellers' Company has provided. The college, having a frontage to Tower Bridge Road and backing on to Tanner Street, Bermondsey, commands a most central and convenient position. The freehold has cost nearly £10,000, and the building and equipment of the college will require a similar sum, so that altogether the new Technical College represents a gift of £20,000.

LONDON.—A garage which is being erected by the "Daily Mail," at Wormwood Scrubs, for the purpose of housing the Clement-Bayard airship during its visit to London, is estimated to cost £5,000. The building is to be in perfect readiness by August 30. The builders are Messrs. R. Moreland and Sons, Ltd.

MIRFIELD.—An elementary school, half of which is for babies, and half for infants, was opened recently. Each portion has its central hall, around which are placed the classrooms. The various contracts have been carried out as follows:—Builders, Messrs. John Brown and Sons, Bingley; joiners, Messrs. Halliday and Glew, Queensbury; plasterers, Messrs. Bancroft and Sons, Halifax; plumber, Mr. H. Lindley, Leeds.

NEWPORT.—The erection of a new higher elementary school, designed by Mr. C. F. Ward, the borough architect, is shortly to be commenced.

SANDGATE.—The foundations for the centenary memorial to Sir John Moore at Sandgate are now being put in. The memorial shaft has been quarried, and is being worked with a view to being in position by September 23. The bronze bust of Sir John Moore will be on the side of the monument facing Shorncliffe Camp.

SOUTH SHIELDS.—The infants' department of the Mowbray Council School was opened recently, having cost about £6,800, exclusive of land, furnishing, and professional charges. The department comprises ten classrooms grouped round a central hall, accommodating altogether 600 children. Mr. Henry Grieves, A.R.I.B.A., is the architect, and Messrs. Stephen Sheriff and Sons, of South Shields, are the general contractors. Mr. L. R. Todd has acted as clerk of the works.

Proposed New Works.

ABERDEEN.—At the latest reported meeting of the Plans Committee of Aberdeen Town Council, six sets of plans were submitted, representing work of the aggregate value of £2,500. The plans were for the erection of three dwelling houses, and for sundry alterations and repairs. It is stated that the Episcopalians in the diocese of Aberdeen and Orkney are desirous of establishing a cathedral church, the diocese being the only one in Scotland that is without a cathedral. St. Andrew's, Aberdeen, is favoured as being the most suitable building for the purpose. Certain structural alterations would be necessary, and these would include the removal of the galleries and the extension of the west gable.

ACHNACARRY.—Plans have been prepared by Mr. P. Macgregor Chalmers for a new church which it is proposed to build here in connection with the Church of Scotland.

BARNES, SURREY.—Plans for the following works have been recommended by committee for the approval of the Barnes District Council: lavatory, Mill Lodge, Lonsdale Road, Messrs. Harrods, Ltd.; eleven houses, Martindale, Mortlake, Mr. H. Burridge; sixty-seven houses and two shops, Milton Road, Church Path, and Sheen Lane, Mr. Archibald Stanley; one house, Deanhill Road, Mr. R. B. Rowell; alterations and additions to 339, Upper Richmond Road, Mr. J. Baxter; addition to house, Vicarage Road, Mr. R. B. Rowell; alterations and additions to 40, Station-Road, Mr. Frederick Smith; six flats, Lower Richmond Road, Messrs. E. Beach and Co.; additions to coach-house adjoining Cleveland Hall, Mr. G. W. Smith; seven shops and ten flats, Castelnau, Mr. Arthur W. Osborn.

BLACKBURN.—The congregation of St. Peter's R.C. parish, Mill Hill, Blackburn, have in hand £2,100 towards the erection of a new church which is estimated to cost £6,000, but must raise at least £900 more before building operations can begin, and they hope to realise this amount by means of a bazaar.

BRADFORD. — Three gentlemen — the Lord Mayor of Bradford, Mr. Jacob Moser, and Mr. Joseph Craven, have each given £5,000 to start the fund for the erection of a new infirmary for Bradford, for which purpose an endeavour will be made to raise £100.000.

CLEVELEYS, LANCS.—The new church of St. Andrew, Cleveleys, for which designs have been prepared by Mr. R. H. Cunliffe, of Accrington, is to cost £5,000, and to seat 550. A vicarage and Sunday school are also to be built.

CLYDEBANK.—Warrant has been granted to the City and Provincial Heritable Company, Ltd., Hope-street, Glasgow, to erect seven four-storey tenements of shops and dwelling-houses in Kilbowie Road and Slip-road, Clydebank; also for the erection of a Congregational Church at Radnor Park, and Mr. Walter Kidd was granted permission to erect a double villa in Park Road, Dalmuir.

DUNDEE.—Among the plans that have been recently submitted for the consideration of the City Engineer are those for new centre reading-rooms that the Town Council propose to erect in Ward Road and Barrack Street.

FARNWORTH.—Mr. Lomax has been instructed to proceed with the working plans, specifications, and quantities for the new Carnegie library that is to be erected here at a cost of £5,000.

LOFTUS.—It has been proposed to erect a new school here, at a cost of £3,500, but the ratepayers have held a meeting protesting against the expense. The Council have decided to consider the matter at a special committee meeting.

MORECAMBE.—The Town Council have approved of a scheme for widening the promenade from the Winter Gardens to the West End Pier to a uniform width of 80ft.; to build a new sea wall from a point opposite Highfield to the West End Pier; to double the tramway track in order to afford greater facilities for the working of the system; and to erect new bandstands and construct underground lavatories and shelters. The whole work is estimated to cost £13,000. and is to be put in hand as early as possible, in order that it may be completed for the opening of next season.

NEWPORT, CO. MAYO.—The late Mr. Martin Carey has left £10.000 for the erection of a Roman Catholic Church here.

ROMFORD.—Plans recently approved by the Romford Urban District Council include those for a theatre in the Swan Field, for Mr. T. Cottrell.

STOKE-ON-TRENT.—The question of the extension of the Town Hall has been referred to the Council in committee, the assessor in the recent competition having stated that in his opinion the proposed expenditure of £25,000 on the work was hardly adequate to the requirements.

Notes and News.

There are prospects of better times for the building trade in Dundee. Schedules are issued for the £12,500 contract for the Central Reading Room, and the schedules are to be issued shortly for the £3,000 contract for the construction of the Blackscroft Library. Tenders are also being received for excavations at Caldrum Street Baths. It is also expected the Town Council will be asked to sanction the recommencement of work at Kinghorne Road.

* * *

We are informed that, as from July 31st, 1909, the firms trading as the Imperial Automatic Light, Ltd., the Standard Acetylene Co., Messrs. Hussons, Ltd., the Master Acetylene Co., will trade as Imperial Light, Limited, acetylene engineers, 123, Victoria Street, London, S.W. Departments: Acetylene installations with "Standard" plants; Imperial lights, windproof acetylene flares and hand lamps; oxy-acetylene welding and cutting work, or installations for same, carbide, and purifying materials.

* * *

If the local reporter is to be trusted, a curious performance was given by the gentleman who ceremonially "cut the first sod" for the foundations of a new church at Halifax. "Mr. Taylor was presented with a handsome spade, suitably inscribed, and a barrow, with which he cut the sod and wheeled it away in a decidedly workmanlike manner." Workmen certainly do strange things in the misapplication of implements, but we refuse to concede that it was "decidedly workmanlike" to cut the sod with a barrow.

* * *

The City of London, now that the Traffic Bill has received the Royal assent, has become its own traffic authority, with large powers of dealing with the many problems that beset the subject. Whether it will confine its attention to the relief of congestion by the better regulation of existing routes—that is, by forbidding the obstruction by travellers' broughams, brewers' drays, coal wagons, and costers' barrows—or whether it will also adopt the more heroic treatment that may be roughly indicated as street improvement, remains to be seen. Probably nothing drastic will be done until the fate of the Town Planning Bill is ascertained; but, in any case, the Corporation has now the opportunity of making London what it should be—a model business centre.

* * *

"A Small Owner" writes the following rather strong letter to the "Morning Post:" "Not the least atrocious of the many abominable proposals of the Government is that of taxing brick earth as a mineral. Many a small owner has paid a high price for a few acres of land for the purpose of extracting the brick earth from it and making bricks as a means of livelihood, and to tax him upon his laborious undertaking will be unjust and oppressive. Besides, such a tax must raise the price of bricks and consequently of dwellings. Already it is impossible to build good cottages for farm labourers without putting up with quite unremunerative interest on the outlay, because those men cannot afford to pay rents high enough to render the undertaking an ordinary commercial one, and Mr. Lloyd George proposes, in his reply to Mr. Montgomery, published in your issue of August 18, to render the difficulty of housing the working classes worse than ever."

* * *

The foundations for the centenary memorial to Sir John Moore at Sandgate are now being put in near the coastguard station, on the site of which the hero of Corunna resided while training the troops at Shorncliffe. The memorial shaft has been quarried, and is being worked with a view to its being in position by September 23. The bronze bust by Professor Bonanni will be on the side facing Shorncliffe Camp.

Insurance.

Free £500 Accident Insurance Coupons have this week been sent to the following:

Subscribers to "The Builders' Journal" are entitled to a Free Insurance for £500. Every subscriber should apply for this, sending a postcard with the name of the newsagent with whom the order has been placed. Subscribers can also obtain a General Accident and Sickness Insurance (the "Lighthouse" policy) at a reduced premium, which includes the Annual Subscription to this Journal. A pamphlet giving full particulars can be obtained free on application.

J. E. C. S. (St. Monans), G. T. B. (Wrexham), S. W. (Sowerby Bridge), W. T. (Galashiels), E. S. (Oldham), J. F. N. H. (Barnstaple), A. H. N. (Wakefield), A. O. J. (Birmingham), W. J. W. R. (Belfast), E. W. K. (Lewisham), J. J. (Brixton), E. J. M. A. (London, W.), T. S. H. (Oldham), A. N. (Leeds), A. C. (Hornsey), G. R. C. (Leicester), J. J. H. (Loughborough), B. G. (Openshaw), H. G. (Liverpool), J. E. B. (Sherbourne), J. H. (Manchester), G. B. (Aberdare), D. McD. (Dingwall), H. B. (London, N.), W. S. (Sunderland), W. C. H. (Manchester), C. R. T. (Kenilworth), F. C. (Winchester), J. W. F. (Wellingborough).

BURDENSOME REGULATIONS.

A draft regulation issued by the Home Office provides that employers shall, for the prevention of lead-poisoning, supply painters and plumbers with soap, nail-brushes, towels, and wash-basins, and that the workman shall use them, and also wear overalls.

The Employer: Now, then, Smith, get off to the job, and don't forget to wash your hands.
The Employed: Right you are, Guvnor. I've got the paraffinalia, but how can I carry the paint?

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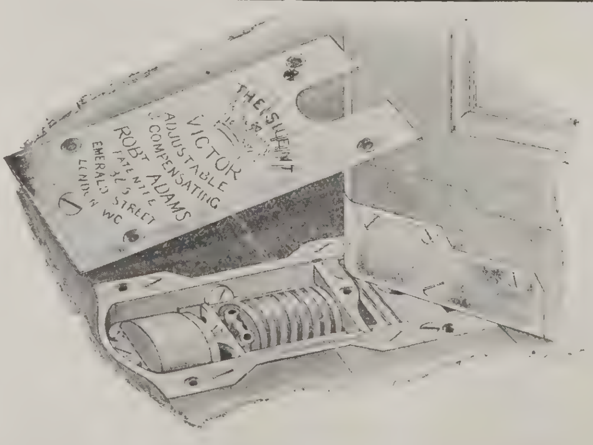

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ADMINISTRATIVE COMMITTEE.

Ex-officio Members:—The President, Vice-Presidents, Hon. Treasurer and Hon. Auditors.

ELECTED MEMBERS.

Northern Centre—T. WILKINSON (Middlesbrough). W. R. THOMPSON (Dewsbury). GEORGE MACFARLANE (Manchester). JAS. STORRS, J.P. (Stalybridge).

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Secretary:

A. G. WHITE, 31 and 32, Bedford Street, Strand, London, W.C.

MONTHLY OFFICIAL REPORTS.

THE NATIONAL FEDERATION.

There is nothing of consequence to report since the half-yearly meeting in July; all matters arising out of that meeting have been put in hand.

Labour Exchanges.

Matters of importance, however, are coming forward, arising out of the present legislation for the formation of labour exchanges, and in connection therewith the scheme for insurance against unemployment, the building trade being one of the industries scheduled for the application of those measures.

As regards the labour exchanges, the idea is to substitute for the present methods of taking on workmen at the works, shop, or job, the method of applying to the labour exchanges for the number and class of men required. A little consideration will make it apparent that such a change of custom will demand some self-denial on the part of builders and their foremen, who have hitherto had the labour seek them wherever the work was going on, and have been able to select and test workmen until they had secured a fairly efficient manning of their job.

The Board of Trade are, very wisely, consulting representative men among the organised employers and workmen before drafting the regulations under which these exchanges are to be formed, with the object of securing the most simple and practicable arrangements and avoiding pitfalls such as might mar the working of the scheme. As far as possible, full regard will, it is understood, be paid to existing customs in the respective trades, but great tact and much loyal co-operation on the part of both employers and workmen will be needed to bring about so radical a change in the method of taking on workmen.

The regulations will be eventually submitted to the consideration of the various parties affected, and their suggestions considered before final issue.

Unemployment Insurance.

The unemployment insurance scheme will involve a contribution from the employers of our industry equal to perhaps 10s. to 15s. per £100 of wages paid. The idea seems to be that in some way the employers, by supporting the labour exchanges, and so aiding in the better distribution of whatever labour work is going, will be helping materially in keeping down the cost of the insurance against unemployment, and thereby keep down the amount of their own contributions thereto. How this is to be brought about has not yet been made quite clear, but doubtless it will be fully explained when the preliminary conferences with employers take place.

Annual Conference of Secretaries.

The secretaries generally are reminded that the conference of secretaries will take place on October 19th at Leeds, and that the undersigned is very desirous of receiving suggestions for the agenda. So far, very few are to hand.—A. G. WHITE, Secretary.

The Northern Centre.

Secretary: James Denver, Cromwell Buildings, Blackfriars Street, Manchester.

The following is Mr. J. B. Johnson's report to the Northern Centre on the recent negotiations leading to a further amendment of the National Agreement between the "Employers" and the National Association of Operative Plasterers, which, it will be remembered was accepted at the Portsmouth meeting of the National Federation on July 21st.

The first agreement dated 1899, Mr. Johnson states, was drafted and signed at the termination of a national lock-out in that year. Before the lock-out took place, the employers issued a manifesto specifying the points at issue with the N.A.O.P., which may be summarised as follows:—1, the N.A.O.P. require foremen to join union; 2, the N.A.O.P. require limitation of apprentices; 3, the N.A.O.P. boycott certain employers, print and circulate black lists of same; 4, the N.A.O.P. refuse to work with non-unionists; 5, the N.A.O.P. disputes as to demarcation of work; 6, the N.A.O.P. object to submit all trade disputes to a conference with employers before stoppage of work.

Under the first agreement—that of 1899—only two of the points at issue, viz., No. 5, "disputes as to demarcation of work," and No. 3, "blacklisting of employers," were dealt with satisfactorily. No. 2, "limitation of apprentices," was compromised by the employers agreeing that no employer should engage any additional apprentices to the trade while the number of his apprentices exceeded 1 apprentice to 4 journeymen. This arrangement still holds good, and in the new agreement the attention of local committees is directed to see that apprentices do not leave one employer for another in any irregular manner.

No. 1. "Foremen."—This point is now settled upon the following basis—that foremen regularly employed as such shall be at liberty to join the union or not, as they please.

No 4. "Refusal of the operatives to work with non-unionists or defaulters."—Under the new agreement, the operatives have agreed to cancel any objection to work with a defaulter, providing the default has occurred prior to the year 1899.

No. 6.—Under the new agreement, *all trade disputes* are to be submitted to a conference of employers and operatives before any stoppage of work can take place under any pretext whatever. Six days are allowed to locally consider disputes; and in case an agreement is not reached, an appeal can take place to a National Committee, for which ten days are allowed. The committees, both local and national, are to meet at least once a year, and provision is made for rules of procedure on the lines of the National Conciliation Boards in the other branches of the building trades. When the agreement was amended in the year 1904, a new rule was agreed upon, providing that employers were not to be called upon to pay more than the local standard rate of wages to men taken on at a job.

Lancashire, Cheshire and North Wales Federation.

At the annual general meeting of the Lancashire, Cheshire, and North Wales Federation, held in Manchester on June 21st, Mr. William Cooke, jun., plasterer, Preston, was elected president for the ensuing year in succession to Mr. William Bullen, Liverpool.

Before vacating the chair, Mr. W. Bullen, on behalf of the local associations and his colleagues on the administrative committees, presented the retiring hon. treasurer with a gold watch and chain, together with an illuminated address in album form. Mr. Bullen, in making the presentation, spoke in high terms of Mr. Marshall and the services he had rendered the Federation, and, having read the address, handed it to Mr. Marshall, together with the watch and chain.

Mr. Marshall, in reply, expressed the great pleasure it gave him to be with the federated representatives once more; he was not an orator; and to say that he was much obliged was but feebly to express his feelings. Most people were able to buy themselves a watch, but money could not buy the good feeling expressed by that meeting in appreciation of his services. The Federation, he proceeded, had in its early days passed through bad times financially, but he was pleased to see that he left it with a balance of over £1,000 in hand. He was sure the members of the Administrative Committee with whom he had worked so long were doing their utmost for the good of the trade, and he would always bear in pleasant remembrance the many friends he had made during his term of office. Amidst loud applause, he concluded his remarks by thanking all those who had contributed to give him so handsome a present.

Mr. Thomas Meadows, Stockport, was elected senior vice-president, and Mr. Frank Woods, Bolton, junior vice-president. Mr. Thomas Woolfenden, Rochdale, was appointed hon. treasurer.

The other officers and committees were duly elected according to rule.

LIVERPOOL ASSOCIATION.

Secretary: Bertram B. Moss.

The Belgian master builders arrived at Liverpool on August 9th. The visitors, who included sixteen ladies, numbered altogether ninety-six. They left their homes in Antwerp, Brussels, and Ghent on Sunday morning, August 8th, and, travelling by way of Ostend and Dover, reached London the same evening. They did not, however, remain in the metropolis, but came direct to Liverpool, arriving there in the small hours of Monday morning.

The Reception Committee was formed by the Liverpool Master Builders' Association, and consisted of Mr. Frank Griffiths, president; Mr. R. Arthur Costain and Mr. Charles Tomkinson, senior and junior vice-presidents respectively; Mr. R. Stevenson Jones, treasurer; Mr. Bertram B. Moss, secretary; Mr. J. B. Johnson, Mr. N. R. Stirling, Mr. Samuel Fowler; Mr. Otto Heinrich, who acted as honorary interpreter, Councillor John Dawson (Huddersfield), and Mr. A. G. White, secretary of the National Federation of Building Trade Employers of Great Britain and Ireland. These gentlemen, in conjunction with Messrs. Thomas Cook and Son, the tourist agents, arranged a comprehensive programme covering the whole of the day. Notwithstanding that they had only been able to obtain a few hours' sleep, the visitors were ready at half-past nine in the morning for a drive round the city, the gentlemen named, together with Mr. T. D. Alderson and Mr. Miles Mason, Messrs. Cook's representatives, accompanying the party to point out the various places of interest. The route had been selected with a view of embracing all the chief architectural features of the city. Glimpses were obtained in the first instance of St. George's Hall and the magnificent range of municipal buildings in William Brown Street, and then such institutions as the Exchange Buildings, the New Cotton Exchange, the Town Hall, the Queen Victoria Memorial, were passed in review. The drive was continued up Hardman Street and Myrtle Street, where are situate the School for the Blind, the Philharmonic Hall, and the new Children's Infirmary, to Sefton Park. There the party alighted and walked up to the Palm House. On the return to town, a call was made at St. James' Mount, and some time was spent in an inspection of the new Liverpool Cathedral, by permission of the Cathedral Committee and of the contractors, Messrs. R. Morrison and Sons.

For luncheon the visitors were divided into two parties, one sitting down under the presidency of Mr. Griffiths at the Adelphi Hotel, and the other at the Hotel St. George under the chairmanship of Mr. R. Arthur Costain. At each sitting the visitors very cordially pledged the health of the president and members of the Liverpool Master

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Builders' Association, their spokesman at the Hotel St. George being Mr. Hesbain, the president of the Antwerp Association.

For the afternoon a trip was arranged on the Overhead Railway to the Canada Dock, where the Celtic was inspected by permission of the White Star Company. On returning the party viewed the new Royal Liver Offices and the new offices of the Dock Board, and then proceeded to the landing stage, and embarked on the Dock Board's steamer Galatea for a cruise on the river. This proved one of the most enjoyable and interesting features of the day's outing, and the visitors expressed their keen appreciation of the courtesy extended to them by the Dock Board in placing the vessel at their disposal. In the evening seats were booked at the second house at the Empire. From Liverpool the visitors proceeded to Sheffield (see the report from the Sheffield Association, given below), and thence they went to London, as recorded in last week's issue.

BARNSLEY ASSOCIATION.

Secretary: J. Denton.

The monthly meeting of Barnsley Association was held at the King's Head Hotel, on Wednesday, August 11th, the president and the senior vice-president (Councillor G. Haigh and Mr. E. Broley), with Councillor W. G. England, J.P., being present at Sheffield in connection with the reception of the Belgian delegates, and the junior vice-president (Mr. C. D. Potter) being confined to his house from injuries received in a trap accident, the chair was taken by Mr. J. Smith, who was supported by twelve members.

A letter was read from Mr. J. Davidson, secretary of the Yorkshire Federation, pointing out certain knotty points with respect to the recent resolution and discussion, at the last monthly meeting, on an alleged infringement of the building bye-laws in the building line of the proposed new tea-rooms at the local park, the report of which Mr. Davidson had read in the BUILDERS' JOURNAL. The tone of the letter was very favourably commented upon, and the definition of the statutory powers of a corporation found general acceptance. Correspondence was also read from Mr. Davidson, calling attention to the National Reserve Fund, and asking for the generous support and loyal co-operation of the various local centres. Mr. T. Lindley having explained to the several new members present the objects of the National Reserve Fund, it was unanimously resolved to lay an equitable levy on each member, and that the amount raised be paid without delay.

A copy of the fair wages clause in contracts, as approved by the National Administrative Committee, was next submitted by the secretary, the general feeling being, however, that the clauses did not apply to the Barnsley district.

An acknowledgment was received from the Town Clerk of Barnsley with respect to the recent letter sent by the Federation on the proposed tea-rooms.

Mr. T. Lindley submitted the report of the Yorkshire monthly meeting, held in Scarborough. He called special attention to the duty of supporting in every possible way the official organ of the Federation, the BUILDERS' JOURNAL, a copy of which was handed round by the secretary for the inspection of the new members. Mr. Lindley laid special stress upon the remarkable value members obtained for their money (apart from official connection). The secretary (Mr. J. Denton) corroborated Mr. T. Lindley's remarks, and added that as the BUILDERS' JOURNAL had been adopted as the official organ of the Federation, it was their bounden duty to subscribe to it.

It was unanimously resolved to call the attention of the Sheffield Association to a case of alleged infraction of the fair wages clause in the form of contract by a Sheffield firm, who were members of that association. The secretary was instructed to write to the secretary of the Sheffield Federation, and also to the contractors in question.

Votes of sympathy were accorded to Mr. C. D. Potter, junior vice-president, and Mr. H. Jacues, secretary of the Operative Joiners' Society, with reference to their recent accidents. It was a remarkable coincidence that both gentlemen are secretaries of the Local Conciliation Board, the former representing the employers, the latter the operatives.

A vote of thanks was unanimously accorded to the acting chairman.

SHEFFIELD ASSOCIATION.

Secretary: Thos. Smith.

The Visit of the Belgian Master Builders to Sheffield.

The Belgian master builders (to the number of 96), who visited Sheffield on August 10th and 11th, will doubtless carry back with them memories of as pleasant and interesting a time as, in the role of hosts, they provided for their Yorkshire friends who visited Belgium last year. The arrangements were in the hands of the Sheffield Association, whose efforts were most heartily supported by representatives of several other associations in the Yorkshire Federation who shared the Belgian hospitality last year.

The visitors reached Sheffield early on Tuesday morning from Liverpool, where they had been entertained by the Liverpool association, and were met at the station by representatives of the Sheffield Association, including the president (Mr. W. W. Mears) and Messrs. A. J. Forsdike, J. Biggin, J. D. Cook, T. Eshelby, W. Longden, J. Wilkinson, and T. Smith (secretary), together with the Belgian Consul (Mr. Schott) and Mrs. A. J. Forsdike and Mrs. W. Longden. After a hasty visit to their respective hotels they were taken to the Town Hall, where they were received by the Deputy Lord Mayor, Ald. H. P. Marsh, who gave them a hearty welcome to the city. The Lord Mayor, who was unavoidably absent, provided refreshments, and, in company with the municipal officials, the visitors made a tour of the Town Hall. Thence they were taken to the extensive electro-plate works of Messrs. Walker and Hall. At 1.30 the party found themselves at the Builders' Exchange, where a lunch had been provided to which about 130 persons sat down. Here the president (Mr. W. W. Mears) formally welcomed the visitors. It would be difficult, he said, to equal the welcome with which the Yorkshire builders were received in Belgium last year, but the Yorkshiremen were, on the present occasion, determined to do their best. One matter only cast a shadow on their gathering, and that was the remembrance that the esteemed Burgomaster of Antwerp, who received the Yorkshire builders so hospitably last year, had passed away. The president could assure our Belgian guests that the English builders shared their grief at the loss of a gentleman who occupied such an exalted position and was so intimately connected with their association.

Mr. Hesbain (president of the Antwerp Association) replied in English, and Mr. Van Autryve (president of the Ghent Association) spoke with much enthusiasm in Flemish, his speech being subsequently translated by Mr. Hoffmann, and loudly applauded. Further speeches were given alternately in English, French. and Flemish, amid scenes of much enthusiasm.

After lunch the visitors were shown over the cutlery works of Messrs. Joseph Rodgers and Sons, Ltd.

In the evening the visitors were entertained to dinner at the Royal Victoria Hotel, at which nearly 160 persons were present.

The president (Mr. W. W. Mears) was in the chair, and was supported by Colonel Sir John Bingham, the Mayor of Barnsley (Ald. Rideal), the Mayor of Rotherham (Councillor D. Mullins), Mr. J. S. Rose (Deputy Mayor of Barnsley), Councillor Fenton, Mr. R. M. Prescott (Town Clerk), Mr. F. E. P. Edwards (City Architect), Mr. Hadfield (City Road Surveyor), and Messrs. J. Biggin, A. J. Forsdike, J. D. Cook, T. Eshelby, W. Longden, T. Roper (Sheffield), Mr. A. W. Sinclair (Scarborough), Mr. R. Schott (Belgian Consul), Councillor J. Daw-

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son (Huddersfield), Mr. J. Davidson (secretary Yorks. Federation), Councillor England (Barnsley), Mr. E. M. Gibbs and Mr. T. Smith (secretary). Amongst the Belgian guests were Mr. A. Hesbain (president of Antwerp Association), Mr. V. Merckx (president of Antwerp Conciliation Board), Mr. Vandewren (V.P. Brussels Association), Mr. Van Autryve (president Ghent Association), Messrs. A. Grangé and F. Van Dyck (secretaries of Antwerp Association), Mr. E. Opdebeeck (president of Excursion Committee), and Mr. F. Staadt (treasurer of Brussels Association).

The toast list was printed in both English and French for the convenience of the visitors, and the menu was a fine example of the printers' art, and was much in demand by the visitors as a souvenir of the occasion. On the front appeared the English and Belgian flags in colours interlaced, while in the centre three panels carried the portraits of the respective presidents of Sheffield, Brussels, and Antwerp.

The loyal toast having been duly honoured, Mr. Biggin proposed "La Belgique et Son Roi;" and took occasion to refer to the fraternal feeling which existed between the English and Belgian builders, a feeling which he knew was also shared by the people of both countries. They had very happy memories of the reception which was accorded them in Belgium last year, and they desired to reciprocate it in every way possible.

Councillor Dawson, in proposing "Les Entrepreneurs Belges," spoke in his characteristically happy vein, and his speech having been translated into Flemish by Mr. Hoffmann,

Mr. Hesbain (vice-president of the Belgian National Federation), replying in English, thanked them for the sympathetic reference which had been made to Belgium and to their King, whom they called in Belgium the King of the Builders. He had been told that a characteristic of Sheffield was its welcome to strangers, and their experience had confirmed this. Since they made the acquaintance of the Sheffield builders last year, they had urged them time after time to pay a return visit, and had even sent delegates to convey their invitation. They had no doubt that they would be received with open arms, but they were bound to confess that they never expected such a brilliant reception as that which had been given them. Their Sheffield friends had overwhelmed them with their marks of friendship and sympathy. He hoped that their gathering would promote more and more the co-operation of the builders of all nations, an object which was being most persistently pursued by Mr. Van Ophem (Brussels), who they regretted was unavoidably absent. At present, however, it was encouraging to note that the International Federation comprised 15 nations (including the English), and nearly 20,000 members. Between England and Belgium there had existed for centuries a mutual friendship founded on the same love of political and individual liberty and respect of the traditions of their forefathers.

Mr. Vandewren (speaking in French) referred to the happy results which were following the initiative of the Sheffield Association last year. They said in Belgium that union was force, and their international union could not but be productive of the greatest good.

Mr. Van Autryve also spoke in Flemish in a similar strain.

"The City and International Trade of Sheffield" was proposed by Mr. A. J. Forsdike, who regretted that the shortness of the visit did not permit them to show their guests more of the "Steel Metropolis." He hoped that they would carry back happy memories of their visit.

Colonel Sir John Bingham, replying in French, thanked the guests for the honour they had done to Sheffield by visiting it.

Mr. J. D. Cook proposed the toast of "The Visitors," to which the Mayor of Rotherham and the Town Clerk of Sheffield responded.

Wednesday saw the visitors astir early, and at 9.30 they left in special trams for the works of Messrs. Vickers, Sons and Maxim, where they were shown over these extensive works, and witnessed the rolling of an armour plate, and the forging of a large gun.

Lunch was again provided at the Builders' Exchange, and at 2 o'clock the party, whose numbers had now been swelled to more than 180, left in carriages for a drive through some of the prettiest Derbyshire scenery to Chatsworth House and park, and afterwards drove on to Grindleford, where tea was provided, Sheffield being reached by various sections of the party between 10 and 11 p.m.

On the visitors leaving Sheffield for London, on the Thursday morning, a pretty little ceremony took place on the platform, where the Belgian party presented beautiful bouquets to Mrs. W. W. Mears, Mrs. A. J. Forsdike, and Mrs. T. Smith.

On Sunday the following telegram, addressed from Dover pier, was received by the president (Mr. W. W. Mears): "Before leaving England, the Belgian master builders wish to send to your association their brotherly salute, with the expression of their feelings of gratitude for your kind reception, which they will remember for ever.—Hesbain."

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Supervising Engineer E. G. Hopson, Portland, Ore, reports that the tests have been so satisfactory that the Government is proceeding with the manufacture of reinforced concrete pipes for carrying pressure currents of water on several of the projects in hand in his territory. He says that the interior diameter of the pipe tested is 46ins. and the thickness of the shell 3ins. The concrete was made of one part Portland cement, 1½ parts sand, and 2 parts gravel. Reinforcement consisted of specially wound 5-16in. wire which was subjected to strains in tension of 12,000lbs. to the square inch of metal.

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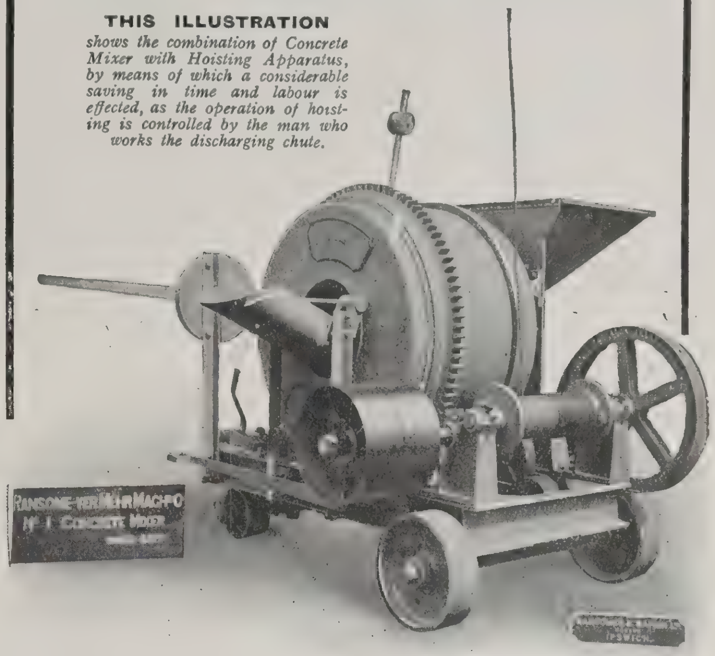

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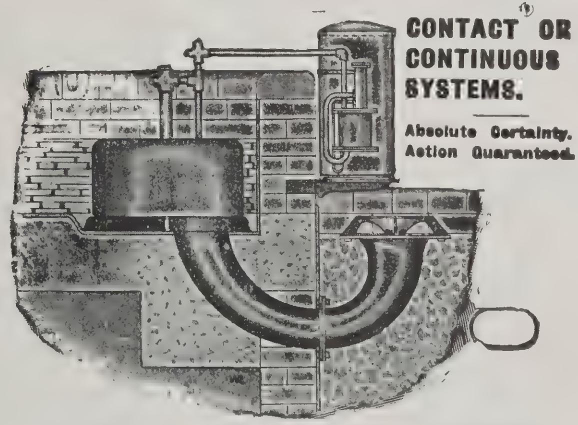

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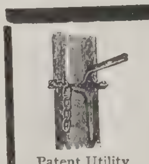
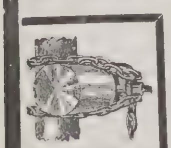

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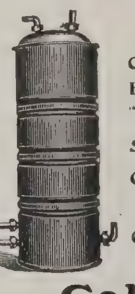
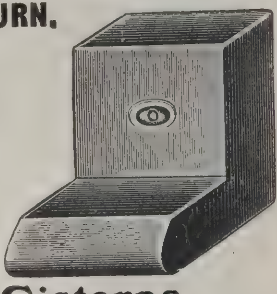

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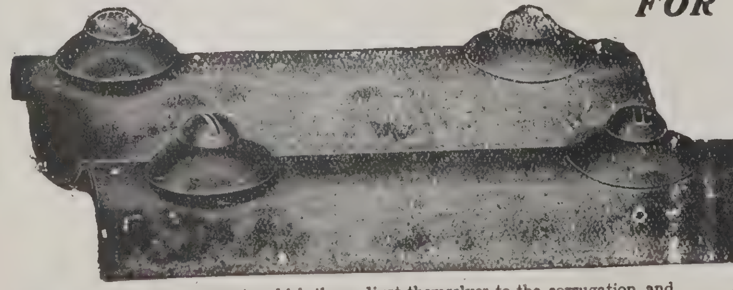

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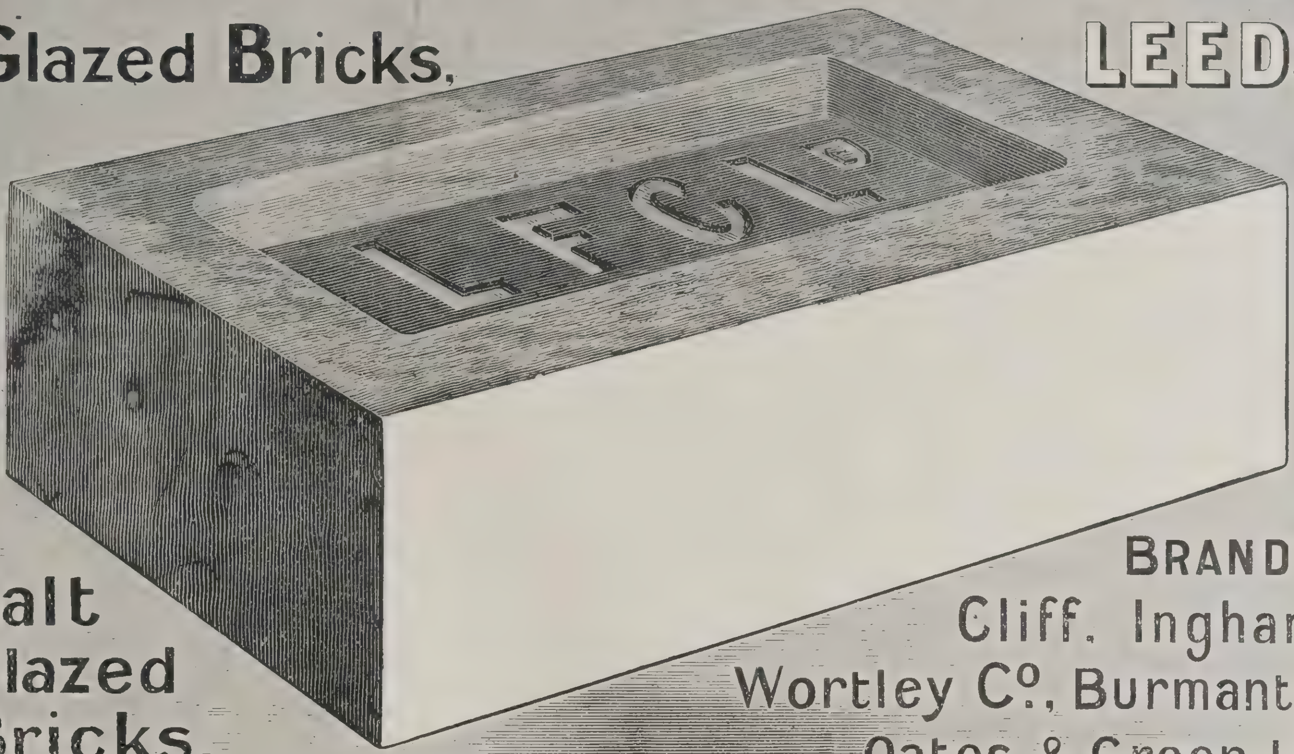

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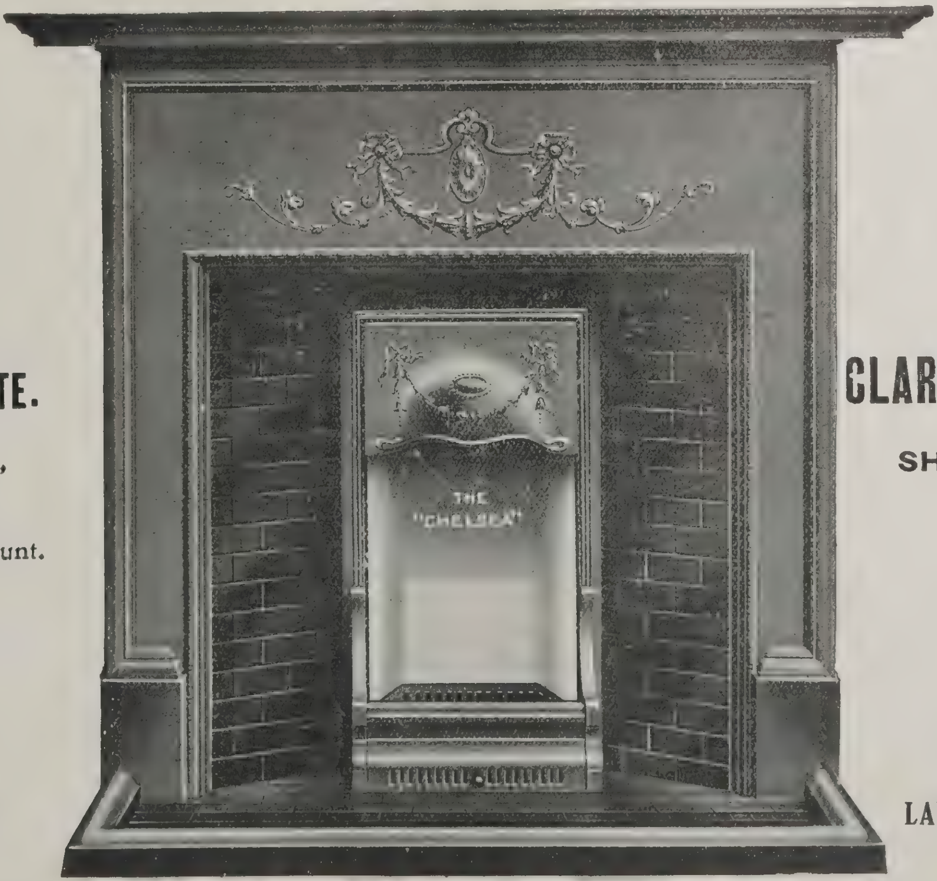

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(Tenders continued from page vi.)

Graiseley.—For the erection of new elementary school at Graiseley, Wolverhampton, for the Education Committee. Messrs. Fleeming and Son, architects, Wolverhampton. Quantities by Messrs. Vale and Kingsford, Wolverhampton and Gloucester:—

Hammond Bros.	£16,580	0	0
W. Wistance	14,587	0	0
Boswell	13,022	7	0
Roe	13,327	0	0
L. Jones	13,300	0	0
Speake and Sons	13,297	0	0
T. and S. Ham	12,900	0	0
H. Lovatt	12,865	0	0
Gough and Son	12,860	0	0
Cave and Son	12,827	0	0
Willcock and Co.,* Wolverhampton	12,750	0	0

Heating.

Bridges and Son	£933	0	0
Killick and Cochran	895	0	0
Dargue, Griffiths and Co.	825	10	0
Brightside and Co.	785	0	0
Lawrence	765	0	0
Beavon and Co.	700	0	0
Ashwell and Nesbitt	755	0	0
Smith and Son	755	0	0
Haden and Co.	751	10	0
Brown	740	0	0
Taylor	700	0	0
Manley and Co.,* Wolverhampton	599	0	0

Lighting.

Manley and Co.	£270	0	0
Reed	261	0	0
Hallett	258	15	0
Brown	250	0	0
Gas Company	250	0	0
Ward,* Wolverhampton	249	12	6

*Accepted.

Keswick.—Accepted for erecting four blocks of cottages, for the Committee of Derwentwater Tenants, Ltd., Mr. A. N. W. Hodgson, architect, 9, High Street, Windermere. Quantities by architect.

Blocks C, and E, J. and R. Hodgson, Keswick, £2,540. Blocks A and D, W. Cowperthwaite and Sons, Keswick, £2,660.

London, W.C.—For alterations to Vine Street police station. Mr. J. Dixon Butler, architect, surveyor to the Metropolitan Police. Quantities by Messrs. Thurgood, Son, and Chidgey, 8, Adelphi Terrace, Strand, W.C.:—

Prestige and Co., Ltd.	£4,486
Mowlem and Co., Ltd.	4,483
Foster and Dicksee, Ltd.	4,457
Grover and Son	£4,277
Patman and Fotheringham	4,243
Kilby and Gayford, Ltd.	4,200
Ashby and Horner	4,110
Trollope and Sons and Colls and Sons, Ltd.	4,095
F. and H. F. Higgs	4,054
Higgs and Hill, Ltd.	4,049

London, E.C.—For warehouse building, Goswell Road and Compton Street, E.C., for Mr. G. Redhouse. Mr. W. Leonard Dowton, architect, City Bank Chambers, Bedford Row, W.C. Quantities by Mr. G. A. Webster, 10, Gray's Inn Square, W.C.:—

G. Andrews and Co.	£5,123
Mason and Co.	4,688
J. Marsland and Sons	4,574
Courtney and Fairburn, Ltd.	4,547
Rice and Son	4,545
G. H. Denne and Son	4,456
J. Groves and Son	4,432
Mattock and Parsons	4,427
Patman and Fotheringham	4,381
G. Parker and Sons	4,365
S. Redhouse and Son	4,344
E. A. Roome and Co.*	4,203
J. Chessum and Sons	4,197

*Revised tender at £4,120. Accepted.

Northwood.—For the erection of a new police station at Northwood. Mr. J. Dixon Butler, architect, surveyor to the Metropolitan Police. Quantities by Messrs. Thurgood, Son and Chidgey, 8, Adelphi Terrace, Strand, W.C.:—

T. J. Messom and Son	£5,321	0	0
G. Godson and Sons	5,300	0	0
E. Potterton	5,300	0	0
G. and J. Waterman	5,269	0	0
W. J. Page	5,059	9	0
Fassnidge and Sons	5,003	0	0
Hill Bros.	4,994	0	0
H. Haynes	4,850	0	0
J. Willmott and Sons	4,803	0	0
C. F. Kearley	4,793	0	0

Nuneaton.—For erection of a house, Hinckley Road, Nuneaton, for Mrs. F. Vyle. Ernest E. Shepherd, architect, New Bridge Street, Nuneaton.

Thos. Hickman, Market Harborough	£756	11	0
G. E. and W. Wincott, Nuneaton	702	18	6
A. Bedingham,* Nuneaton	695	1	0

*Accepted.

Nuneaton.—For erection of a house, Queen's Road, Nuneaton, for Dr. F. C. Torbitt. Ernest E. Shepherd, architect, New Bridge Street, Nuneaton.

Thos. Hickman, Market Harborough	£697	19	0
Geo. Cooper, Nuneaton	695	0	0
C. W. Streather, Nuneaton	680	0	0
G. E. and W. Wincott, Nuneaton	£677	0	0
Kelley and Son, Foleshall	664	4	0
H. Taylor,* Nuneaton	595	0	0

*Accepted.

Pontypool.—For the erection of three villas at Freeholdland, near Pontypool, for Mr. Frederick Harvey, of the Swan Inn, Pontnewynydd. Mr. A. Gordon Babbidge, architect, Clarence Chambers, Pontypool:—

J. A. Saxon	£1,345	10	0
Gregory Bros., Pontnewynydd	1,221	0	0
W. Cudby, Garndiffaith	1,200	0	0
A. and J. Richards, Griffithstown	1,128	0	0
W. and A. Davies	1,080	0	0
E. Sainsbury, Pontypool	1,075	0	0
R. Meara	1,065	0	0
W. Branch	1,006	16	0
Powell Bros., Pontypool	1,002	10	0
W. Arthur*	989	0	0
H. N. Case, Pontnewynydd	930	0	0

* Accepted.

Weybridge.—For erection of house on the Beechwood Estate, Oatlands Park. Messrs. Crickmay and Sons, architects, 13, Victoria Street, Westminster, S.W.:—

W. A. Anflett, Walton-on-Thames	£1,875	0	0
W. Greenfield, Weybridge	1,868	17	4
H. P. Hill and Sons, Oatlands Park	1,745	0	0
G. Willis, Weybridge	1,686	0	0
W. W. Gale, Woking	1,650	0	0
G. Jarvis, Weybridge	1,560	0	0
J. Lee, Walton-on-Thames	1,550	0	0
Gaze and Sons, Walton-on-Thames	1,537	0	0
T. C. Ranger, Walton-on-Thames	1,485	0	0
Drowley and Co., Woking	1,459	0	0
H. J. Nicholson,* Weybridge	1,350	0	0

Winterbourne (Glos.).—For new Council school at Winterbourne, for the Gloucestershire Education Committee. Mr. R. S. Phillips, Gloucester, county surveyor:—

Marsh and Stone, Bedminster	£3,990
J. Browning	3,785
P. H. Turner, Winterbourne	3,719
E. Clark and Sons	3,715
E. Love	3,585
Orchard and Peer, Stroud	3,500
J. Long and Sons, Ltd., Bath	3,486
Byard and Sons, Gloucester	3,345
W. T. Nicholls, Gloucester	3,290
Adams and Jefferies	3,240
Walters and Sons*	3,217

Rest of Bristol.

*Accepted.

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AND ARCHITECTURAL ENGINEER.

This issue contains Articles on Fire-resisting Construction and Fire Prevention.

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Builders' Locked-up Capital. A notorious evil that has long operated with ruinous effect in the building trade is illustrated with almost dramatic force in the instance of a Northern firm who have just voluntarily "filed their petition." This firm, which is of long and honourable standing (it was founded in 1848, is paying something like £2,000 a week in wages, and has occasionally paid as much as £6,000 a week), has been led to take this course for the simple reason that clients are in its debt to the very pretty tune of £80,000—actually eighty thousand pounds sterling! This thumping sum is said to be "locked up" in buildings for which payment has been unduly delayed. This current instance of the evil may be exceptional in its magnitude, but it is not otherwise extraordinary. Unhappily, financial failures among builders who would be perfectly solvent and prosperous if only they could come by their own are too frequent and familiar to excite much attention. They have come to be regarded as commonplace and customary trade incidents. Any fatalistic and spiritless submission to unfairness, however, is to be strongly deprecated. It simply aggravates and encourages an evil that ought never to have been tolerated by the trade. It has been allowed to grow to monstrous proportions because of the former lack of unity among builders, who in the old days could be more easily played off one against another than is possible now that the members of the trade have been wise enough to organise for mutual protection. It is only by concerted action that this distressing evil can be mitigated; and certainly whatever steps are possible should be promptly taken to arouse the public conscience in the matter of unreasonably and unjustly delayed settlements. United action and a determined front may bring a welcome relief from at least the worst horrors (the term is surely not extravagant, when we recall the undoubted fact that from this cause honest men have been harassed into untimely graves) of this curse of the trade. Insurance against bad debts and against deferred settlement of accounts has been suggested as a palliative; but the knowledge of such resources would simply harden the heart of the unscrupulous client. An aggressive assertion of right and justice would certainly be more dignified and would probably be more efficacious. Doubtless all commerce and industry are founded on a well-ordered system of credit; but the grave abuse of the system on "Kathleen Mavourneen" lines—"It may be for years, and it may be for ever"—should be discountenanced and discouraged in every possible way. The ordinary owner is apt to be "long-winded" enough; but it is amongst the millowners of the North that the vice is most rampant. They have reduced deserment to a fine art. In this quarter, we are credibly informed, failure to pay up within a reasonable time is habitual and systematic. The builder erects a mill; for years the owner refrains from paying for it, and is all the while making in reality a free exploitation of the builder's capital. The £80,000 belonging to the firm that has been impelled to file its petition is, it may be supposed, only unproductive in the case of the persons who by every moral right are entitled to the interest on it. It is those among whom it is distributed, by whom it is withheld, and to whom it does not belong, who presumably are realising more or less handsome profits out of it. Of course the evil of long credit does not end here. A long train of ill consequences may ensue upon the initial default. The builder whose clients are tardy in settlement may possibly be himself compelled to get into debt, to lose the discounts and other advantages of prompt payment, and even to borrow at heavy interest. Surely the whole question is one that the National Federation of Master Builders should immediately take into most earnest consideration—a course from which they should by no means be deterred by contemplation of the difficulties with which the subject is but too obviously beset.

Art an Instinct. At a Dutch symposium, it is or used to be the custom for everybody to smoke so prodigiously as to produce an all-obscuring reek; insomuch that, in order to rescue a man's countenance from mere oblivion, it was necessary to blow upon him with a pair of bellows. Even so has it seemed good to clear away the obfuscation from the fair countenance of Art; and the man with the bellows is a leader-writer in the "Times." He has repeatedly rendered this service; and he was never more successful in the dispersal of obscuration than when, in an article on "The Importance of Art," he lustily blew upon the strange misconceptions with which nowadays the issue is apt to be rather effectually obscured. Mr. A. B. Walkley, in his evidence before the Dramatic Censorship Committee, had said that in his opinion the importance of all art was apt to be overrated nowadays, and that we take such things a little too solemnly. The critic does not smite and confound Mr. Walkley, but expounds his meaning, which probably was that the art which strains after the expression of new ideas seems to its devotees to be of more importance than it is: "They are apt to suppose that all art is a mystery only to be understood by a few of the initiated, and even that the narrower the appeal the greater must be the art." The very sensible comment upon this misconception is that "If this were true, then indeed art would be a thing of small importance to the life of man; for only the few who have leisure enough to spend much of their time in cultivating themselves could get any good from it, and the good which they got from it would not be very evident to the rest of the world." This fallacy, the writer declares, could only have grown up in an age with little understanding of the nature of art and of its real importance. The masterpieces of art—in music, poetry, or painting—can only be produced as the result of centuries of popular art. "The master, and the technique of the master, are only possible after generations of obscure and humble effort, which would never have been made unless there had been a popular demand for it." The great masterpieces of art "are what remain to us from the wreckage of the past." Whistler's conception of them as springing into being by a sort of miraculous chance was shallow and unscientific, if not wholly fallacious. Clearly he had but little patience with the theory of evolution, although he would probably have yielded a conditional assent to the critic's proposition that "there must be something wrong with a society which fails in something which men have always tried to do and which gives innocent pleasure when it is well done." This follows upon a statement—which none dare dispute—that "so strong is the instinct of man to ornament everything connected with his daily life that if he cannot devise good ornament he will always devise bad," and that "that is the artistic instinct which not even the nineteenth century has been able to suppress, and which therefore we may assume to be, like love, as strong as death." The instinct—one is very doubtful about the legitimacy of the word, but it would perhaps be difficult to find a more appropriate substitute—is all too easily perverted; but, contrariwise, it should be easily susceptible to right cultivation. It can be trained to noble uses. Hence, as William Morris recognised in the substance and in the title of his famous lectures, we are perennially beset with "Hopes and Fears for Art;" and if we are wise and of good courage, the hopes shall predominate and prevail. To this end the man with the bellows is helping us mightily. By the vigorous and persistent application of his homely but effective implement, he is creating for us, if not a perfectly clear atmosphere, at least a sort of chiaroscuro, in which the true forms and lineaments of things become more clearly defined and more certainly discerned and recognised.

An Abortive Building Code. The New York building code is ten years old. It is therefore, as codes go—especially in swiftly moving America—a hoary antiquity. Building practice has got a long way beyond it, and £40,000 has been spent in revising it. Yet the resultant new code has been rejected, mainly because it was polluted with what a newspaper writer euphemistically calls "politics." What he means by this expression is made pretty clear when he adds the explanation that the proposed new code, "while excellent in many of its provisions, contained certain stipulations and restrictions that would have caused serious disadvantage to the community, although pecuniarily profitable to the interests responsible for their enactment." The axe-grinders, it appears, were defeated by "the energetic and reasonable opposition made by engineers, architects, and building contractors," who objected to the favouring of certain brands of building materials and equipment. The point around which contention raged most fiercely was a pronounced preference for brick and tile fireproofing to the disadvantage of concrete. This unfairness was fatal to the code, which, however, was excellent in the parts that were not infected by the deadly virus of "politics," as it provided for the examination and registration of engineers, architects, and builders, and stipulated for more efficient means of protection against fire and of preserving the public health. It would appear that the code had to be accepted or rejected holus-bolus; or, at all events, it does not seem to have occurred to the New Yorkers to adopt the advice of Hamlet to his mother, and "throw away the baser part and live the better with the other." Indeed, for some reason of which we in this country are happily not in a position to fathom the darksome depths, such a course would seem to be quite impraticable in the peculiar circumstances of American public life; for it is added that it is doubtful whether the good points "can be inserted in the next revision, whenever it may be made, without considerable opposition." All this is very, very sad; but any pharisaic impulse to enlarge on the superiority of our own public wisdom and morality should be repressed with careful artistic restraint. It might provoke reprisals; for the conflict between public and private interests is probably universal and sempiternal, although the methods of pursuing it are apt to differ with the country and with the diversities of national temperament. But we are nevertheless heartily glad to learn that the American engineers, architects, and builders are on the side of the angels, and, with their aid, possess sufficient dynamic force to defeat the hosts of darkness.

The Whitgift Almshouses. In another part of the present issue we print an article in which Mr. S. W. Kershaw, F.S.A., presents some interesting particulars relative to the inception and building of Whitgift's Hospital at Croydon. Together with other curious data, it is shown what the materials are, whence they came, and, in some instances, what they cost. In this account it is shown how completely the Hospital fulfils the crucial condition that modern purists have of late years persistently imposed: it is indigenous to Croydon. This was, of course, a foregone conclusion, seeing the age of the building; for although doughty deeds were done in the spacious and strenuous days of great Elizabeth, the means of conveyance and the state of the roads forbade the carrying of building materials over great distances. The fact that the Whitgift Hospital sprang as it were from the earth on which it stands is one reason why it looks so much more at home than the modern buildings which in its native simplicity it puts to shame. Of course it cannot be helped that most of our wood, much of our glass, and some of our slates are nowadays brought overseas from far countries. Nevertheless, the people of Croydon may excusably take pride and pleasure in the knowledge, to which we are happy in drawing attention, that this venerable and beautiful building is racy of the soil, a true creature of its natural environment, thoroughly English and completely Croydonian; and this consideration ought surely to make an irresistible appeal to local sentiment and patriotism, even if the artistic merits and historical association of the building were deemed to be an insufficient warrant for its preservation. We are happy in the assurance, which is given on the authority of an obviously inspired announcement in the "Times," that the Local Government Board will absolutely refuse to sanction the demolition of the Whitgift Hospital.

Town Hall Trials and Troubles. The selected plans for Burslem Town Hall are criticised at considerable length and with somewhat caustic severity by an anonymous correspondent of the "Staffordshire Sentinel," who complains that the assembly hall is not large enough, that supper-rooms, lounge, reception, card and entertaining rooms have not been provided, that the concert-hall is similarly ascetic, and so forth. He adds, "I cannot blame the assessor," because the printed conditions "merely require certain rooms, without indicating how these rooms are to be used." That the conditions of architectural competitions are seldom or never satisfactorily drafted, is an old story; the successful design that pleased everybody would be an amazing novelty. Still, as the correspondent remarks, the object of exhibiting the designs is presumably "to invite the criticism of the ratepayers who will be called upon to find the money," and who are proverbially entitled to "take it out in grumbling." By the way, is it quite fair to architecture for the ratepayers to make their town hall (there is here no special reference to Burslem) such a jumble of heterogeneous interests? Many of them are required to be of such mongrel constitution as to recall the famous compromise illustrated by Mr. J. F. Sullivan in a series of his inimitable drawings on "The British Working Man: by One Who Does Not Believe In Him." The client wanted a summerhouse built. The workman he consulted suggested that a pig-sty would be more profitable. The client pleaded even unto tears for a summerhouse. The workman's stony heart was so far affected that he resorted to a generous and an ingenious compromise. The resultant structure was so cleverly arranged in a Composite style, that it could be used either as a summerhouse or as a pig-sty, or as both, and nobody could tell from merely looking at it which it was really intended to be. If some of our modern muddled town halls do not exhibit a similar lack of definite character, it is because the architects have shown singular adroitness in reconciling diverse features that are mutually and almost hopelessly antagonistic. But the municipal appetite for this sort of mixed pickles seems to be general and insatiable.

Early London Theatres. In an announcement to the effect that Sir H. Beerbohm Tree has been invited to unveil a commemorative tablet marking the site—on one of the buildings appertaining to Messrs. Barclay and Perkins's Brewery, Bankside — of Shakespeare's Globe Theatre, the reporter has been betrayed, by the exuberance of his enthusiasm, into an egregious error. He claims that the Globe was probably the first theatre built in the Metropolis. Of course it was nothing of the kind. In fact, it was actually constructed of the materials of a theatre that had been in existence for more than twenty years at Finsbury. And thereby hangs a tale, which, founded on the actual facts, has been well told, if we remember rightly, by Mr. A. T. Quiller-Couch, in "Shakespeare's Christmas," with the addition of a good deal of handsome imaginative embroidery. It is told more convincingly if less artistically by Mr. T. Fairman Ordish, F.S.A., in his excellent "Early London Theatres." The Theatre, as it is called, was built in 1576, for the Burbages, on ground belonging to one Giles Allen, who, when the lease had expired, wanted to assume the ownership of the building. The Burbages and their friends, including Shakespeare, formed an armed party, who, in spite of protest and active opposition, demolished the Theatre, and conveyed the materials to Bankside, where they built the Globe. The party, in the words of Allen's Bill of Complaint against Cuthbert Burbage, "did then alsoe in most forcible and ryotous manner take and carrye awaye from thence all the wood and timber thereof unto the Banckside in the parishe of St. Marye Overyes, and there erected a newe playhowse with the sayde timber and wood." As to its materials, therefore, the Globe lends colour to the reporter's light-hearted assumption of priority; but as a structure it was junior to perhaps more than half-a-dozen other theatres. Its claim to commemoration is its association with Shakespeare, who was one of its proprietors, and with Ben Jonson and other great lights of the Elizabethan drama.

THE BUILDING OF WHITGIFT'S HOSPITAL.

By S. W. Kershaw, F.S.A.

In the County of Surrey are two hospitals for the poor, one at Guildford, founded by Archbishop Abbot, a native of that town, and another at Croydon, erected by John Whitgift. Such charitable institutions would seem to be the successors of those earlier structures in our land, which were used by travellers, pilgrims, or the monastic orders, in the 14th and 15th centuries, to whom they offered a refuge and hospitality. In the sister County of Kent, we find good examples of these buildings, of St. Bartholomew's Hospital at Sandwich, Eastbridge and St. John's at Canterbury, and another at Habledown. At Angers, the hospital of St. Jean, built by our Henry the Second, is almost perfect, and one of the treasures of 12th and 13th century domestic work in that city of artistic and antiquarian wealth.

The building accounts of Whitgift's Hospital reveal minute particulars of the care in the development of the building, which occupied three years. The first stone was laid February, 1596, and the building was finished September, 1599, the payments and charges were inspected weekly by Samuel Finch, Vicar of Croydon, and alterations, made from time to time by the Archbishop. The materials were all obtained from the locality, and the total expense was £2,716 11s. 11d., a large sum in those days. The bricks, lime and mortar were made near Croydon, the timber and stone also from the county, while the downs around the town afforded the chalk material, which was converted into lime and cement. The great Wealden forest of Sussex stretched into the Surrey border, while Norwood or the Northwood, dense in timber and underwood, surrounded Croydon on its London-ward side. Lingfield seems to have supplied much of the timber for the hospital, as appears from an entry in the accounts.

"There is hewed at Lingfield 27 loads of timber and a half at xvj's the load."

"For the carriage of four loads from Lingfield to the hospital at xj per load."

Nearer home from a wood called Dragnells, the name probably surviving in Dagnall's Park, near Selhurst, "xix loads of wood were obtained and used for the kiln at xiiij'd per load."

This item would be for kiln faggots that were employed for fuel, in the burning and mixture of the lime and chalk.

Wood might also have been obtained from the Archbishop's park, an appanage to the old Palace at Croydon; this park no longer exists—in past times, a keeper was regularly appointed; the name of the park survives in Park Hill, long ago modernized by suburban villas.

The stone for the hospital was found in the quarries of fire stone, extending from Reigate to Limpsfield northwards to Merstham; it was chiefly used for the details, as appears from the building accounts, "so much good and seasoned free-stone as shall be sufficient for the doors and windows."

The Surrey historians, Manning and Bray, mention a quarry at Godstone, where a sort of freestone was obtained, and "was made into window sills and coping stones of walls and sent to London." Great care was taken in laying the foundations of the hospital, "flint and chalk was provided for the building, and small for filling, because the lower ground is not so good and firm as the upper, and the weight of the work may not be trusted only on brick." It appears some of the stone was brought from Southwark, according to another entry, "paid for carriage of loads of hard stone from Southwark to the hospital."

This statement would refer to landing the stone at Southwark, in those days, river transit was the ordinary method, and Reigate stone which was used for building of the old Westminster Palace and for additions to Windsor Castle would have been sent by water and landed on the Thames bank.

Of the famous Nonsuch Palace, built by Henry the Eighth, portions were of Reigate stone.

The work at Whitgift's Hospital went on systematically, in a thorough manner, the two corner stones were laid by the Archbishop in March, 1596, and in June of that year "the first of all the hospital was reared." In 1597 all the outwork as tiling was finished, and in 1598 the seats in the Chapel were finished, and the Chapel paved and the door hinged in 1599. On the 9th of July, 1599, the hospital was dedicated to the use of the poor by Bishop Bancroft (London), and Anthony Watson, Bishop of Chichester, the seal of the foundation was that of Dires and Lazarus, and the statutes were framed by the Archbishop. The inmates who need relief not to exceed 40 in number, to be chosen by the Archbishop and his successors, from those employed at Lambeth and around, also from Croydon, and from some Kentish parishes.

Gardens and orchards once surrounded the hospital, but the pressure of building extension has much curtailed these grounds. The interior of the hospital is rich in carved and panelled work as seen in the hall and other rooms. The quadrangle affords an excellent view of the building, mellowed by the old brickwork, and picturesque in the trim flower beds around, somewhat recalling the college enclosures at Cambridge.

The little chapel in the corner of the quadrangle contains some old glass. The fittings and seats of the chapel were made of knotted timber, and the fine oak wainscot was put up about 1640.

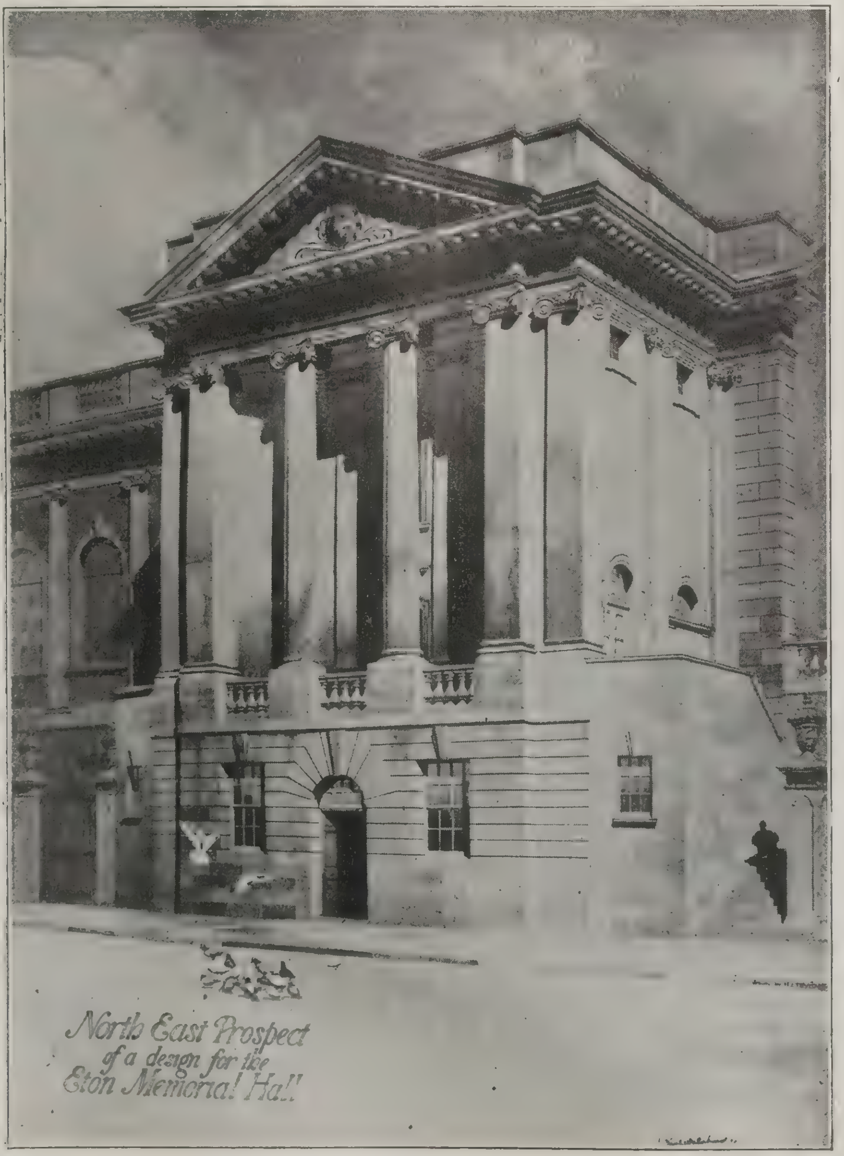
The Hall (where the inmates dine) claims special notice, being in the same condition as when the Archbishop used to dine with what he called "his poor brothers and sisters."

Here is some old glass with the arms of Queen Elizabeth, oaken tables, and on the mantel a block of black stone, part of the Archbishop's tomb (destroyed) in the Parish Church, which was almost entirely burnt in the fire of 1867. Other fine monuments perished, and were broken beyond repair, especially that of Archbishop Sheldon. The Whitgift monument was most ably reproduced by the help of old drawings and the skill of Mr. John O. Scott, F.S.A., architect. The recumbent figure of the Archbishop is surmounted by Renaissance work, with sculptural details, the black and white marble forming a charming contrast to the general setting.

In the large room of the hospital over the gate-house (now the warden's room) Dr. Whitgift used to entertain his friends, the Earl of Shrewsbury, Lord Zouche and Bishop Bancroft—in this room is some fine panelling, a carved mantel with the arms of the founder, stained glass, an ancient chest, and some rare Mazer bowls.

Thus the Hospital remains to-day both exterior and interior, an example of Elizabethan domestic work, the only such in Croydon, and a representative structure perfected and considered in every detail and method.

Such work to an extent endorses the graphic words of the historian, J. R. Green, who in his "History of the English People" wrote (in speaking of the change in architecture in the 16th century) "a social as well as an architectural change covered



PAUL WATERHOUSE, M.A., F.R.I.B.A., ARCHITECT, England with buildings where the thought of defence was abandoned for that of domestic comfort and refinement." Untouched by the Parliamentary forces which devastated, for a time, the old Croydon Palace, Whitgift's Hospital surely claims reverent treatment as an heirloom, not only of the town, but as a monument throughout England. William Morris, whose words still hold sway throughout the land, said of such houses, "Every time one of them disappears is a national misfortune, for while most other mistakes we make may be remedied, the destruction of an ancient building in irremediable."

Not only for architectural value, but for the charitable aim it fulfils, Whitgift's Hospital claims all influential support. By the very words of the Act of Parliament of 1596, "John Whitgift founded a hospital to *have continuance for ever, and to be incorporated.*" Croydon was the Archbishop's home, and his constant retreat, and surely this, his foundation, should for ever stand secure from danger and encroachment. Queen and Archbishop are both associated with this Hospital, for Elizabeth's grant to the founder is still preserved among its corporate papers and archives. Dr. Whitgift, too, was present to soothe the closing hours of the great Queen whose life ebbed away in her riverside palace of Richmond. That fantastic and stately mansion, sometimes called Sheen Palace, had also an architectural history, and the few outlying portions which still remain, tell of the spacious pile, which was the favourite home of the Tudor sovereigns.

[The following paragraph from a recent issue of the "Times" bears the impress of authority, or at all events, of inner knowledge, and seems to set a much-vexed question at rest. As this was a question in which the architectural profession were, for once in a way, able to join heartily with the archæologists, our readers will rejoice at the attitude of the Local Government Board. "It was stated in the 'Times' of August 17 that it was understood that the Local Government Board was in sympathy with the views which had been strongly expressed against the scheme for the demolition of the Whitgift Hospital, Croydon. It may now be taken as certain that the day is very far distant when consent will be obtained for the destruction of the hospital."]

The first, or priming coat, upon a surface of steel in a fit condition to receive paint is of the greatest importance, in view of the circumstances that the union of the paint and the substratum depends entirely upon the adhesion of this coating, and the first problem to be solved in the painting of steel is necessarily—not which paint sticks best on another coat of paint, but which paint adheres most firmly to iron. For a long period red lead alone was employed for this purpose, and even now still enjoys a reputation not altogether undeserved, and, when in competent hands, has given very fair results. It must be borne in mind that of all pigments red lead requires the smallest proportion of oil or varnish in order to form a distributable and well-covering paint; and it must be noted that the protection afforded by the pigment is largely dependent upon the property it has of absorbing and retaining oil. Also, on account of its great specific gravity —(9.19)—the proper mechanical mixtures of red lead with oil is almost impossible, settling and setting take place very rapidly; hence the general practice of mixing in the kettle before the application. The best priming coat is obtained by the use of orange lead, a pigment of lower specific gravity—(6.85)—and of finer texture, which, when mixed in certain proportions with an inert pigment having a great oil-absorption, produces a paint which can be properly ground and mixed for use, having, by reason of its fineness, great adhesive power, and capable, owing to the presence of the inert pigment, of lessening the oxidising action

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

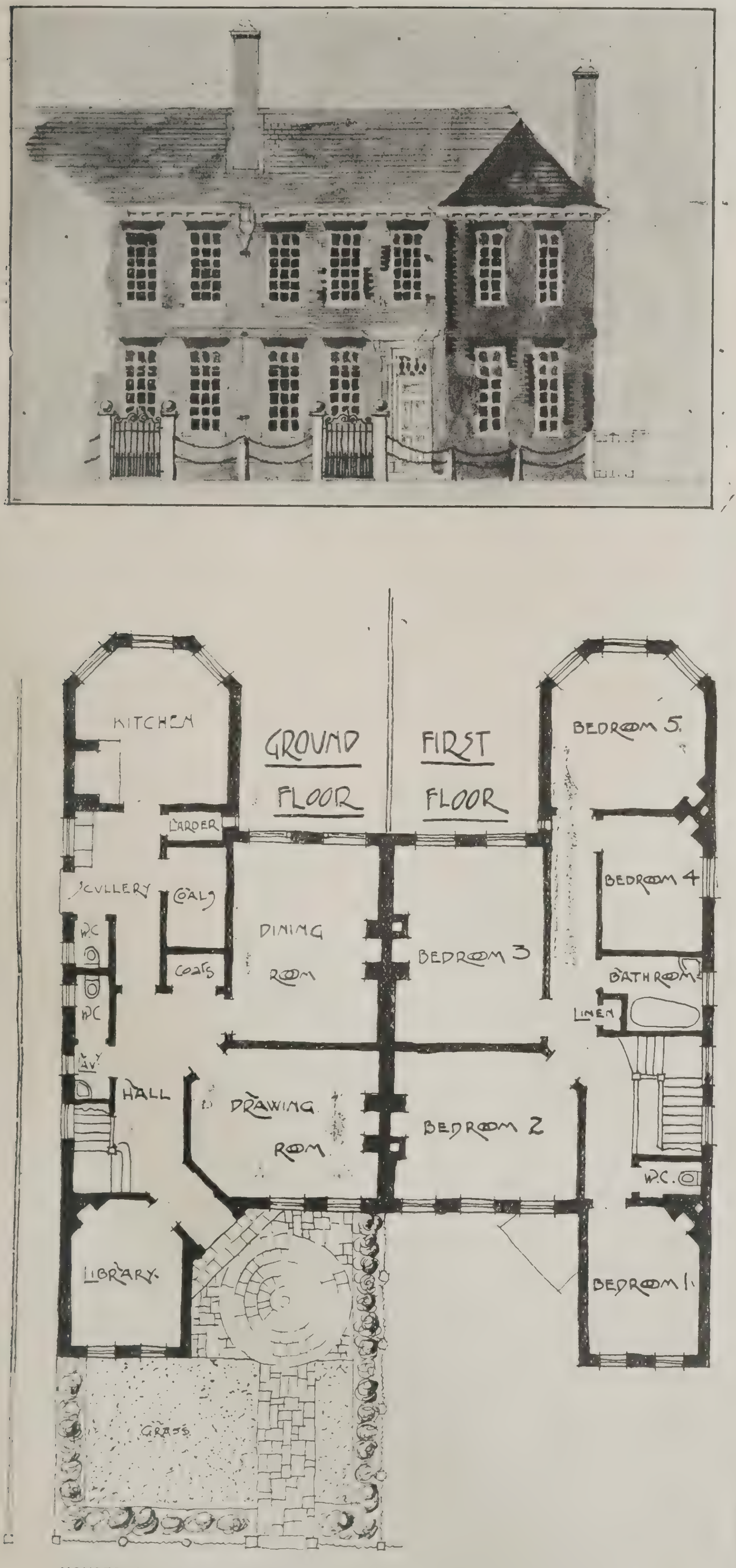
Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Oct. 1.	ABERDARE HOSPITAL. The Aberdare Urban District Council invite competitive designs for a fever hospital for 52 patients, including administrative block, outbuildings, etc. Premiums of £100, £50, and £25 for the designs placed first, second, and third respectively. An Architectural Assessor will be appointed on the nomination of the President of the Royal Institute of British Architects: also a Medical Assessor to act jointly. Particulars and conditions of the competition, together with a plan of the site, may be obtained from T. Phillips, clerk, Town Hall, Aberdare, on deposit of £3 3s.
Oct. 11.	HULL TRAINING COLLEGE for Teachers in Elementary Schools. The Education Committee invites Architects to submit designs. Premiums of £150, £100, and £50 to authors of the designs placed 1st, 2nd, and 3rd respectively. Particulars and plan of site may be obtained of J. T. Riley, Secretary of Education, Albion St., Hull. Deposit, One Guinea, returnable on receipt of *bona fide* design, or the return of particulars within 14 days.
Nov. 30.	HERNE BAY PAVILION ON PIER. Herne Bay Urban District Council invite competitive drawings for a pavilion to be erected on the proposed extension of the pier at a total cost not exceeding £4,000, exclusive of architect's commission. Premiums of twenty-five guineas and ten guineas respectively will be awarded for such two designs as shall be judged of sufficient merit by the Council, and placed by them as first and second; the premium of twenty-five guineas to be afterwards merged into the usual commission payable to the architect, provided the work is carried out by such competitor. Plan of the site and copy of the conditions may be obtained on application to the undersigned on and after the 24th instant on payment of one guinea, which will be returned on receipt of a bona-fide design. Drawings to be deposited at the Clerk's Office, Town Hall, Herne Bay, not later than noon on the 30th November next.—Joseph Jubb, Clerk to the Council, Town Hall, Herne Bay.
No date.	NATIONAL MUSEUM OF WALES The Council desires to receive competitive designs for the erection of a new National Museum at Cardiff, Three premiums are offered. The Council have appointed Sir Aston Webb, R.A., Mr. John J. Burnet A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A., as Assessors. Particulars and plans of the site will be supplied to competitors on payment of a fee of £2 2s., which will be returned on receipt of a design in accordance with the conditions, or if all papers are returned within 14 days. Inquiries to be addressed to Dr. Wm. Evans, Hoyle. Director of the Museums. City Hall, Cardiff.

Burslem and Stoke Town Halls.

Several leading articles, and a vast amount of correspondence, have been published in the Staffordshire papers relative to the Burslem and Stoke competitions. The excitement at Burslem seems to be very largely a matter of local feeling. The merits of the chosen design are somewhat grudgingly acknowledged, but complaint is made that local taste, sentiment, and circumstances have been insufficiently regarded, and for this the critics blame neither the assessor nor the successful architects, but the system under which competitions are held. A leader-writer in the "Staffordshire Sentinel" says: "These criticisms do not involve in the slightest degree any reflection upon the skill and the experience of Messrs. Russell and Cooper, who were apparently guided by the printed instructions, which very likely were not sufficiently explicit. Probably no printed instructions could have been sufficiently explicit; local knowledge was desirable, and local knowledge is, of course, not possessed by architectural firms in London, however eminent." This seems to be the gist of the complaint; and it is complicated with an exceeding bitter cry from the distressed ratepayer, who conveys the impression that in these hard times it is wicked to spend money on large building schemes. "Burslem Ratepayer" objects to "hard-earned money being so recklessly and wastefully squandered by such ridiculous schemes as new town halls, etc." Factious elements being so prominent in the controversy, the architectural interest in it sinks almost to zero.—With regard to the Stoke-upon-Trent Town Hall Competition, the exhibition of plans only serves to deepen our regret that, owing to the inability or the unwillingness of the local authority to spend a sufficient amount of money on the project, none of them is likely to be realised in three dimensions. Hence the labours of the assessor, and some exceedingly fine work by some of the competitors, have been rendered comparatively fruitless in consequence of yet another manifestation of the "fault of the Dutch." With regard to the Stoke competition, the assessor (Mr. Stokes) had written as follows:—"A careful examination of the designs sent in for the Town Hall extension competition will, I think, show that the sum of £25,000 is hardly adequate to meet all your requirements. However, of the less costly designs, I am of opinion that the best is Number 33, and the second and third respectively Numbers 1 and 37." The Corporation committee, having considered this letter, and made a detailed inspection of all the designs submitted for competition, could not recommend that any of them was of such a character as to justify the Council in carrying it out, mainly on account of the excessive price. The committee having made a further inspection of the designs placed first, second, and third, were of opinion that as the cost of the first and third materially exceeded the sum of £25,000, they were disqualified under rule 15 of the conditions, and that other sufficient reasons existed for not adopting such designs. With respect to the design placed second by the assessor, although the committee were not prepared to recommend its adoption, they considered that as regarded cost it more nearly conformed to rule 15, and that therefore the premium of £100 (the second prize) should be awarded to its author. The committee recommended that the whole matter should be referred to the Council in Committee. That the committee's position, in condoning in the second design what they have condemned in the first and third, is somewhat illogical need not be insisted upon, logic being the last thing to be expected in public affairs; but it nevertheless seems to place them in an awkward predicament unless the authors of the first and third designs magnanimously waive their claims to the premiums to which they seem to be entitled under the assessor's award. The troubles at Burslem and at Stoke, following so closely on several similar discontents, emphasize the need for careful reconsideration by the R.I.B.A. of the whole subject of competitions. There would appear to be something, or many things, radically wrong with a system that in almost every successive instance produces so much clamour and dissatisfaction.

The restored choir of Selby Abbey is to be re-opened on Tuesday, October 19th next. In response to the appeal issued in June last for £1,000 to complete work upon the fabric, contracts for which had been entered into, the money has been practically secured, but a further considerable amount is needed for furnishing the sanctuary and choir of the Abbey. The Benedictine Abbey at Selby was founded by William the Conqueror in 1069, and raised to the dignity of a mitred abbey by Pope Alexander II. Henry I. was born in the Abbey, and this fact naturally accounts for some of the privileges conferred upon it. The Abbey Church, which has been much changed in appearance since the foundation of the Abbey, was made parochial in 1618.



HOUSES NEAR GOLDER'S GREEN. JOHN W. RHODES, ARCHITECT.

The houses here shown are typical of a series to be erected. While no two sets of plans are exactly alike, all the elevations suggest the same period. The facings are Luton bricks, with red sand-faced long-and-short work, and red rubbed arches. Black sand-faced roof tiles are to be used throughout.

REINFORCED CONCRETE.

By Arthur C. Auden.*

(*Continued from page 132, No. 758.*)

Reinforcement.—Since the issue of the first patent with reference to reinforced concrete in 1831—which it is interesting to note was to an Englishman, and, as far as the author's present information stands, this patent out-dates all others in any country—the number of patent systems, forms, and methods of reinforcement have been very great, of which many survive. However, it is not now proposed to enumerate the various systems, whether patent or otherwise, but only briefly to draw attention to the advantages and disadvantages of such in each particular instance.

First, it may be said that practically every one of the many systems at present in use has good points in which it is superior to others, but it is also certain that no one system has the monopoly of being the best in every instance and in every form of construction. For example, that which is exceedingly good for beams is inapplicable or unnecessarily costly for use in flat surfaces, and the same may be said as regards others for use in columns and not in arches, and so on.

Secondly, it is frequently cheaper to sacrifice a little of the theoretical efficiency of any method for the sake of ease in handling upon the actual work in progress; and all the metal in reinforced concrete being covered up, any error in position due to misplacement or to any part having become loose or driven or shaken out of place when the surrounding concrete is being punned, cannot be seen and put right. It will therefore be readily recognised that any methods involving loose pieces, or such fastened together at many points with small diameter wires, are not so efficient in actual work as those where all the parts are rigidly fixed together.

It is also important that all reinforcement should be so designed as to possess a considerable amount of initial rigidity, so that it does not "sag" or "warp" or "twist" when placed in position in the mould boxes. Many illustrations regarding this could be quoted, but that of compression-bars intended to be above the neutral axis in a beam, sagging down by their own weight till a portion of their length is below the said axis, where it is worse than useless, is not by any means as rare as it should be. The same remarks apply to lateral misplacement, particularly in the case of columns and struts, as well as to the pitching and spacing of reinforcing bars or metal on flat surfaces such as floors, walls, etc. In these last-mentioned it is practically essential to have the bars or metal so designed that they cannot be knocked out of place, as it is almost impossible to keep a number of separate loose bars in proper pitch; it is advisable, therefore, that all reinforcement for this form of work be woven together.

Punching or slitting solid plates into strips or bars is another efficient form of reinforcement for flat surfaces, particularly for those which are approximately square in plan, viz., where the strains are practically equal all over; but for flats where the length is considerably greater than the span, a wire meshing is cheaper, as the cross-span wires take the load, the longitudinal ones being only necessary to keep the others in pitch, and it is not advisable to pay for metal and strength in the longitudinal direction where it is not wanted.

Auxiliary Tension Members in Beams and Slabs.—An examination of all the accepted specifications, for the last ten years, dealing with reinforcement, or a reference to the advertisement pages of technical journals, will show that it is almost universally acknowledged that these important accessories must be inclined to the main tension-bars and *not* be at right angles thereto, and also that such bars must be so designed as to retain absolutely their positions where they are connected to the main tension-bars and cannot be slipped or moved along the same when ramming the concrete or otherwise. The reason for this inclination appears on examination of a slab breaking under a test load. It will be seen that the cracks are not normal to either the neutral or transverse axis, but are at an angle thereto, and it is known that the most efficient way of preventing any two surfaces from coming apart is to spike them together with a nail at right angles to themselves. This reinforcement is therefore designed so as to pass through the weak portion of the beam or slab where cracks are likely to occur, at right angles to such cracks (or planes of rupture) this reinforcement being of course in addition to the main tension-bars taking the main tensional stresses below the neutral axis of the beam. It is not such good practice, though frequently exceedingly convenient, to obtain auxiliary tension members by means of placing a large number of rods or bars in the bottom of the beam and bending up the ends of them at various points, although by this means the desirable inclination abovementioned is gained, but this design involves a considerable excess of metal at the centre of the beam and a greater weight of steel than is required must be purchased.

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* Part of a Paper read at the Liverpool meeting of the Institution of Mechanical Engineers.

Reinforcement of Struts and Columns.—There are two very distinct methods of reinforcement in use for these—one being that in which the vertical bars are prevented from spreading by being spirally wound with rods or wire, and the other where the same end is obtained by means of rings or loops of wire tying the vertical bars together, such loops or rings being arranged at various distances apart to suit the design and strength desired. Both these methods have good and bad points, each one being the best under appropriate conditions.

The spiral winding has given most excellent results, and is considered by many to be the best for columns, etc., as it permits the use of lighter and fewer vertical rods, but it has the disadvantage of being somewhat difficult to make it a "good mechanical job," that is, so that the spirals shall all be the same diameter and parallel in bore, otherwise some will clasp the group of vertical bars too closely and others hardly touch them, which results in unequal stresses. This is, however, generally made much easier by using bands of flat rectangular section which bend readily, and by first winding the spirals on a cylinder and then slipping them over the vertical bars when made. Great care must be taken when using spiral reinforcement in vertical columns that it is not made in too long lengths, as all the concrete has to be put in from the top of each length, and it is well known that when concrete is dropped from even a small height the mixture of its constituents becomes very uncertain. Care must also be taken that each length of spiral is "corkscrewed" well into the one below it, as otherwise there is a plane of weakness between each length of spiral. This form of reinforcement must be so designed that the required strength is obtained without the pitch of the spiral being closer together than the size of the largest pieces of aggregate used, as if it is so, the stones become jammed between the coils and a lack of homogeneity is the result.

The second method of column and strut reinforcement above-mentioned, namely, loops or rings slipped over the vertical bars and held at the proper distance apart, is also an excellent one, especially when the loops are carefully made mechanically on hard metal formers, so that each one is an exact replica of its neighbour; the result being that each one equally clasps the group of vertical bars, otherwise should one be tight and the other slack the bursting strains will not be taken up by all the loops in equal proportions. As the first desideratum of this design of column and strut reinforcement is the prevention of the vertical rods spreading apart under the load (the loops themselves being further apart, do not resist the bursting strains on the concrete to the same extent as the spiral windings), it is not good practice to allow the loops to be curved in between the points where they touch the vertical bars. Unless the wire or rodding forming the loop is straight between its resistance points, it does not get a chance to develop its tensional strength, as it must "pull itself straight" first, which it does at a low stress. For this reason the use of comparatively high-carbon steel is often recommended for columns or strut loops, as it is stiffer to resist distortion; and as distortion is one of the main things to avoid, particularly in this phase of reinforcement, the use of harder steel, if the same can be obtained without any marked increase in cost, appears to be certainly indicated; in fact, as the elastic limit of all reinforcement is almost of as great importance as its ultimate strength, the use of bars and rods possessing considerable resistance to stretching is certainly to be recommended, provided that the said ultimate strength is not appreciably decreased. The use of high-carbon steels has been recommended for various other reasons.*

It is often said that it is immaterial whether the reinforcing rods are bent or not, as, being bedded in concrete, they are immovable, and doubtless this may be true in a structure where there is no vibration and where the loads are unvarying in amount and disposition; but where it is not so, there is a tendency on the part of the concrete on the concave side of the curved pieces of wire or rodding to become friable, and this tendency should be eliminated in the design by working the reinforcement in straight lines whenever possible. It should also be noted that all the joints of the vertical rods in columns and struts must be in close-fitting sleeves—preferably of good quality lap-welded steam barrel.

When designing reinforcement there are of course many points for consideration quite irrespective of the particular method of constructing or attaching the various parts or members, one of the principal being that all beams or floors running continuously over the tops of columns or stanchions or walls must be reinforced above their neutral axis where they pass over the said columns, in exactly the same way as they are reinforced below that axis in their clear span, as the parts in tension and compression are reversed in these circumstances. In one well-known system the bars are run along both top and bottom surfaces from end to end, but these rods or bars in the compression area are only provided as a means of keeping the shear-members or loops or stirrups in position, not as reinforcement against reverse flexure, nor as such in compression, this last not being needed unless the area above the neutral axis is such that it cannot stand the allowable crushing stress.

The exact position of this neutral transverse—or, more correctly speaking, diagonal—plane of "reverse flexure" has not so far been very exactly located, and it will of course vary with every variation in the distribution of the load. The present practice is therefore to design the reinforcement, over the supports, to overlap the ends of that which runs along the "belly" of the beam. The diagonal auxiliary shear-members connected to each of the main tension-bars above and below the neutral axis thus become parallel to each other, in the same way as the tension members in a lattice girder. The same arrangement must be carried out where the ends of beams rest on and in walls. As will be noted, the ends of the bars are bent downwards into the beam itself when only the beam is in reinforced concrete, but, should the whole structure be of this material, the beams and walls consequently being all monolithic, it is better practice to bend the bars upwards, this being also handier as the men can readily see, and, if necessary, adjust, any bar which may have been displaced by punning or otherwise.

When designing long and deep beams or girders, such as for a railway bridge with flat (not arched) spans, it will also, not infrequently, be found that the available area of concrete in compression above the neutral axis is such that the stress per square inch is more than the concrete will safely stand, that is, more than 550 to 750lbs. per square inch according to the class of concrete and the nature of the aggregate used; but this is easily overcome by using reinforcement in the compression area, always remembering that the value of steel in compression is 50 per cent. less than that of the same in tension. Here also the question of rigidity to resist deformation under compression is important, exactly as it is in columns and struts, and care must be taken that all the separate members in compression are properly braced together to avoid the tendency to spread in any direction, but particularly sideways and downwards. Even with ordinary beams supporting floors this question of the available area of concrete in compression demands consideration, but, the floor and beam being all in one solid piece, not only does the part of the floor immediately over the beam contribute to the desired area, but portions of the floor on each side of this are available also, thus enabling us to regard the beams as of T section, but, except under special conditions of loading, the breadth of floor which we can consider for the purpose of this calculation should not exceed four to six times the breadth of the beam itself, according to the class of concrete and the nature of the aggregate used. But, even with this reservation, this fact of the beams and floors being solid together enables a wonderfully strong and light structure to be obtained. The same diagram also shows in closer section an additional means of obtaining this larger area of concrete in compression, namely, that of making fillets at the junction of the beam with the floor.

Another point to be remembered is that temperature stresses must be carefully guarded against, and that extra reinforcement—in fact, increased scantlings over all—must frequently be adopted for this purpose; as the coefficient of expansion of steel and of concrete is practically the same. In structures such as bridges these variations due to the temperature can be arranged for by the ordinary hinges or expansion joints (of which the latter can be very rapidly and effectively made with thick sheet-lead, the area being such that no pressure it will experience will cause it to "squeeze out"), but in the case of structures where such are impossible, as for instance in an exposed tank or bunker or silo, the only remedy appears to be a general increase in strength, particularly by means of increased reinforcement, and, although perhaps contrary to theory, this method has proved perfectly successful.

Centering.—With reference to the design and erection of forms or centering for keeping the soft, wet concrete in place till it is properly set, there are two main conditions which must always be fulfilled. First, it must be so supported and stayed that neither the weight of the concrete, nor the ramming of it, can make the centering bulge or sag; and secondly, it must be as close-jointed as possible, otherwise the water will leak out and carry with it an appreciable amount of cement, which will weaken the structure. There are many methods of obtaining a smooth face on the finished concrete, such as painting the boards with oil or whitewash, or any material to prevent the concrete adhering to them, but, given fair flush joints in the woodwork, the passing of a thin piece of sheet steel (an old hand-saw with the teeth ground off is excellent for this purpose between the concrete and the board gives, perhaps, the best result whenever the general arrangement permits of its use. When work is to be floated or rendered, a rough surface is of course desirable.

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* Mr. Charles F. Marsh, in a Paper read before the Concrete Institute, stated: "For hooped members, if the allowable compressive stress in the concrete is higher than about 1,000lb. per square inch, it is advisable to use high-carbon steel for the longitudinal reinforcements, and the employment of high-carbon steel for the bindings is always advisable. For the purpose of resisting temperature stresses there is an advantage in the use of high-carbon steel, as its greater resistance will enable it to offer more assistance to the concrete."—Transactions, Concrete Institute, vol. i, page 7.

The question of centering leads naturally to that of the length of time it should remain in place. The author is frequently asked to state his opinion on this *in general*, but no general or hard-and-fast rule is possible—on some jobs or portions of them, 24 hours is ample, on others six weeks is too short. Much depends on the weather, particularly on frost, and much on the over-all scantlings of the various pieces, but, most of all and beyond everything, on experience; in fact, there is no material where experience on the part of the constructors is more important than in all matters connected with reinforced concrete or where more disastrous consequences are likely to follow the lack of such experience. In this connection it is interesting to note the following extract from some remarks made by a gentleman who has done more than any other to place reinforced concrete on a firm basis, namely, Mr. William Dunn, F.R.I.B.A., who said in a paper which he recently read before the Concrete Institute, and from which he has kindly given the author permission to quote:—

"Suppose, however, that the design has been carefully checked, initial difficulties got over, and the work begun, the superintendence of the work is merely the transference of our anxieties to another field. I am very strongly of the opinion that no work of importance should be entrusted to men without experience; our best safeguard against defective work is undoubtedly the skill, experience and honesty of the contractor.

"No engineer or architect, unless he spends all his time during the execution of the work in actual and constant supervision, can secure his employer against dangerous errors on the part of the workman. In steel construction we can examine and measure every part after it is up; not so in reinforced concrete work. Once the concrete is laid we cannot tell, except by cutting into it, whether there are six 1-inch rods or two ½-inch rods inside a beam or pillar, or whether these are 2 inches or 4 inches from the surface. To see that the drawings are actually carried out requires a conscientious scrutiny and attention every minute of the time the work is being done. Much may be observed during a visit, but not everything.

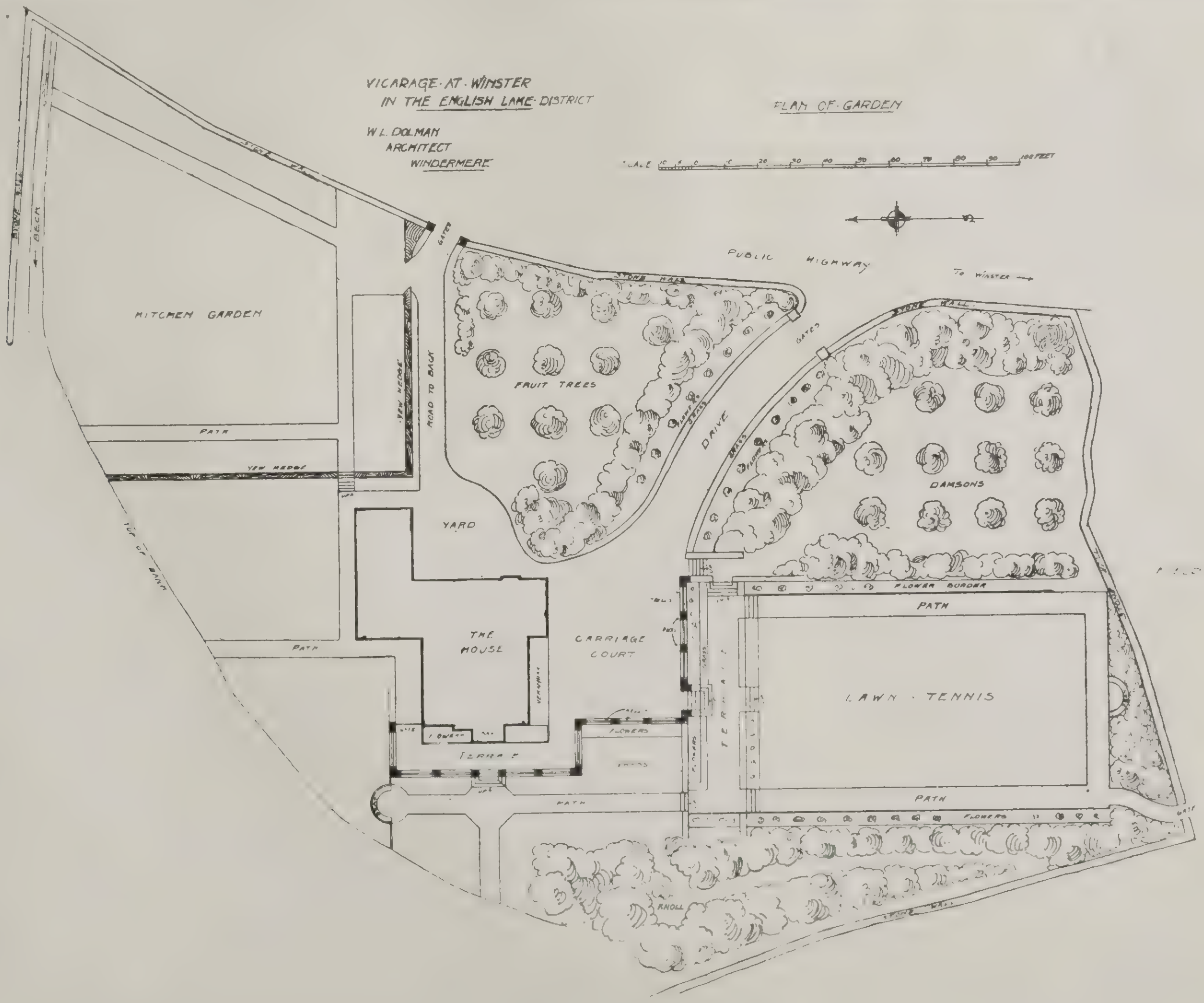
"The number of skilled contractors, clerks of works, and others, constantly increases, and we shall soon all have had experience in this material. But with all the care possible there is a serious risk in employing an inexperienced contractor."

A contractor with considerable resources in the way of plant and materials is also very advisable. It is not long ago since a somewhat serious collapse occurred in a job where the concrete was put in on a Friday and the centering struck on the Monday, as the contractor had not, and could not get, any more timber!

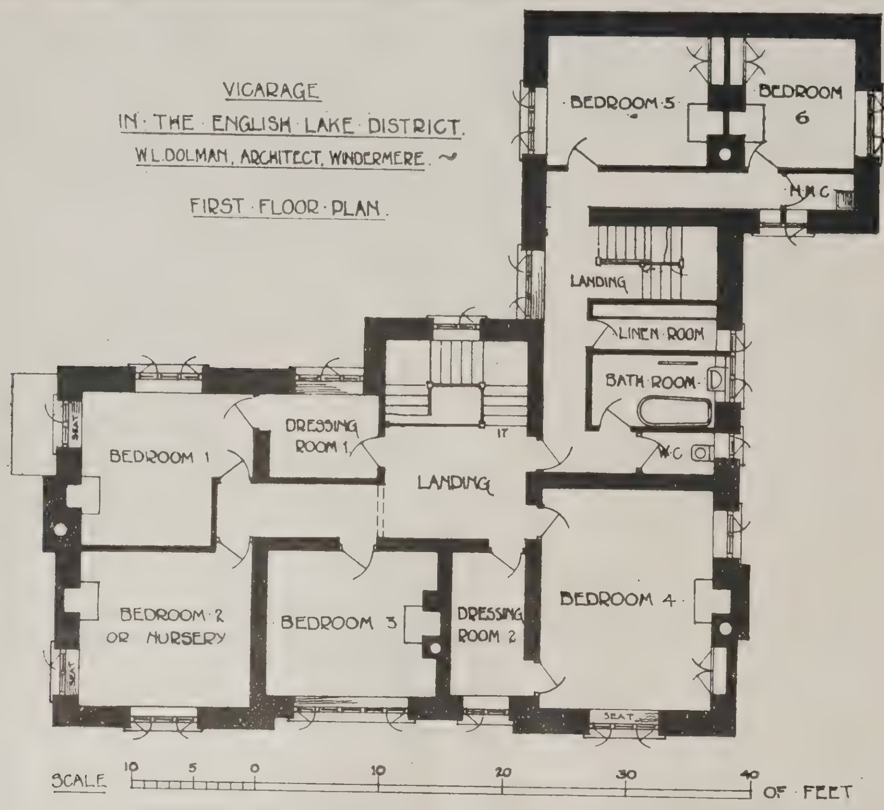
Calculations. — Dealing with ordinary work, such as beams, walls, and floors (which last can be regarded as beams for the purposes of calculation), the simple formula which has been in use by engineers during the past fifty years when calculating the strength of rectangular beams, is eminently suitable for use in designing reinforced concrete. The author has made many calculations and tests to ascertain reliable values for the constant in that formula, which he hopes to be able to communicate at a later date, as also such for use with column and strut formulæ.

Standardization.—The adoption of a series of constants in any set of calculations is useless unless the primary conditions governing the calculations are equal. For instance, the value of the constant, just referred to, is immaterial if the proportions of the concrete or the amount of reinforcement is altered, but these matters are becoming rapidly standardised, and if the proportions of one part of cement to two parts of sand and four parts of stone (this last all to pass 3-in. mesh and refuse ⅛-in.) be adopted, the result need not be feared. This proportion may be also expressed for ordinary use—three 2-cwt. bags of cement, ½ cubic yard of sand, and 1 cubic yard of stone, the mixture resulting in one cubic yard of concrete in place, as the sand and cement are only very little more than sufficient to fill the voids between the stones. This question of voids is important, because certain classes of stone lie much more closely together than others, and it is therefore possible to economise in the purchase of sand, but this is entirely a matter for experience, as a glance at the mixing of the first batch will give more information than the most elaborate calculations.

As regards the percentage which the cross-sectional area of the reinforcement in tension is of the cross-sectional area of the beam or wall or floor, this varies between ¾ of 1 to 2 per cent., but if 1½ per cent. is allowed for in ordinary work, it is quite safe, and may be used as a standard for calculating quantities. Very frequently, however, both this matter and that of the proportions and ingredients above-mentioned have little more than an academic interest for the general user. To take a very common illustration—a works-manager decides to erect a travelling-crane in one of his shops, and proceeds to order the rolled-steel joists to carry the wall-rails—he knows his loads and his spans and that he can buy joists at so much per ton of such-and-such a section at such-and-such a weight per foot, which are guaranteed by some reputable steel-maker to carry the load



(See Centre Plate.)



required at the span decided upon (it must be remembered that we are not now considering any instance needing web or lattice girders, but strictly ordinary work only). He orders his joists without troubling about what proportion of carbon or silicon or anything else is contained therein, and the same procedure can frequently be adopted with regard to reinforced concrete, using the formula before-mentioned or some other similar, to find the scantlings so as to get out the amounts of materials required in order to ascertain the cost. He, the works-manager, may be quite certain that no reinforced-concrete maker of repute will risk his name by putting in bad materials (or good materials wrongly disposed) any more than will the steel-maker with reference to the rolled-steel joists.

Methods of Using.—Reinforced concrete is now so largely and widely adopted that a list of even a portion of the various uses in which it has been already employed would extend to a great length. The following are a few remarks with reference to some of its better-known uses.

Buildings in General.—All buildings should be of skeleton framework construction. The spaces or panels between the columns and beams can be ⅛-inch filled in with reinforced concrete or with brickwork, or the whole frame covered with a skin of stone or brick; but as the main strength is in the frame, such panels can be quite thin, in fact only of such thickness as is needed for dryness, not for strength, which results in a large increase in floor area, particularly in the lower storeys, where, otherwise, the walls would have to be of considerable thickness.

Boats and Barges.—These have been successfully built for several years, and, provided several are ordered of one size, that is, made off the same moulds, they are very much cheaper than steel.

Chimneys.—From current quotations these certainly appear to be cheaper than the same in brickwork, and of course do not need pointing; but there may be a difficulty when one needs to be felled, as at present it is not known how to bring one down in a small area. It is, however, a simple matter if there is space available for the chimney to fall in one length.

Drain and Sewer Pipes.—Many miles of these have now been laid and are giving great satisfaction both as regards first cost and upkeep. Great care is, however, necessary in their manufacture to ensure the reinforcement, both longitudinal and circular, being exactly in its correct position, otherwise there is a great risk of the sewage or water reaching some of the metal and the life of the pipes being therefore very short. One of the great advantages of reinforced concrete sewer-pipes—particularly in bad ground, for instance over old mine workings is that they do not cost any more per yard when made in long lengths, up to, say, 18ft. if required; thus about 75 per cent. in the number of joints is saved and they are able to carry the weight of themselves and contents over spans practically equal to their own lengths. The same remarks also apply to water-pipes.

Dock, Retaining and Reservoir Walls.—The author has already noted the saving in space in buildings due to the use of reinforced concrete, and such is even more the case with these walls.

Fence Posts.—The use of these is increasing very rapidly, but up to the present they are rather handicapped by the want of a cheaper method of attaching the wires to them, the ordinary hooks or staples being practically inadmissible, as they get bent and broken when the posts are bundled for carriage, and clips and bands or screw-plates are costly.

Magazines for Explosions, Safes and Strong Rooms.—Owing to its practically absolute fireproofness, reinforced concrete is particularly suitable for these structures, and recent large and costly experiments in Germany have proved that even the explosion of huts containing 1½ to 2 tons of gelatine dynamite did no damage to their surroundings other than from the air-blast. It was found that the reinforcement was only rent but not scattered, and the concrete blown away in the form of coarse dust.

As regards safes and strong rooms, it can only be said that, although a considerable number have been built, they are still awaiting an actual test at the hands of those skilled in the art of "safe-breaking."

Piles, Piers and Jetties.—One of the principal points to bear in mind when considering the use of reinforced concrete piles is that they will safely carry about three times the load of such in wood of the same cross-sectional area, also that they are no more difficult to drive; and, with reference to piers and jetties, the use of a material which does not deteriorate "twixt wind and water" is a matter worthy of very careful consideration.

Pithead Gears and Pit Props.—These being fireproof is their strongest recommendation, and the latter, if made hollow, are, strength for strength, but very little heavier than ordinary wooden props.

Railway Sleepers.—As the most important question in relation to these is their life, not their strength, nothing but time will prove whether the use of reinforced concrete at a somewhat higher cost than wood will be the more economical in the end, but about five and a half to six years' experience of sleepers in continuous service under heavy traffic and rolling stock so far show no appreciable difference from the day they were laid down, and a recent order for over 100,000 of such shows that they are being extensively adopted.

Telegraph and Tramway Poles.—These are rapidly coming into favour, and very large numbers have been already erected. The fact of their not suffering from corrosion or rust, and therefore not needing painting, together with their being, at present quotations, considerably cheaper than steel, probably accounts for this demand. As they are tubular very great care is necessary in their manufacture so as to ensure that the reinforcement is absolutely accurate in position.

Painting.—The question of painting, although only now referred to, is one of vital importance with all reinforced concrete structures (other than buildings such as houses, offices, etc., which are usually plastered and papered), as it is well known that all naked steel and iron work deteriorates rapidly from rust and corrosion unless it is periodically very carefully scraped and painted. Even when this is done, the amount which is, rightly, deducted for depreciation in the case of a valuation for sale, transfer, mortgage or similar, is very marked, in addition to the actual cost of such scraping and painting. This is particularly the case with bridges owing to their exposed position, and the expense of painting them is frequently considerably increased by the extra cost of the necessary cradling and scaffolding. All this is eliminated in the case of reinforced concrete, which increases in strength with age and is not subject to depreciation, nor are painting or scraping or other methods of preservation necessary. In fact, when comparing the cost of a reinforced-concrete structure with that of a similar one in other materials, it is quite a good rule to work out the cost of the painting and upkeep, and, having capitalized the same at a rate per annum (say one per cent. over the current Bank Rate), to deduct this sum from the estimated cost of the reinforced concrete in order to place both propositions on an equal basis for purposes of comparison.

The author is fully aware that one of the very important questions relating to reinforced concrete from the users' point of view is that of the attitude regarding it of the various authorities, both those governing the country as a whole and those governing each municipal or county area. In some cases it is certainly true that serious restrictions have been placed on the use of this material, but these adverse views are rapidly decreasing, and it is only a question of time till they are eliminated altogether in exactly the same way as the strenuous opposition to the use of iron and steel in buildings or in ships has now disappeared. With reference to municipal restrictions, in Liverpool they are more fortunate than in any other city in the kingdom within the author's knowledge, as each reinforced concrete proposal is considered solely on its merits. Not only must the plans be deposited as usual, but also all the calculations, which are carefully checked. If they prove satisfactory, permission is given to proceed with the structure as designed without any of the vexatious regulations, such as those regarding the thickness of walls which are frequently enforced in other towns quite irrespective of what the said walls have to carry or the strength of the material.

THE FIRE IN CANNON STREET, LONDON.

The accompanying illustrations, which have been reproduced from photographs taken at the scene of the fire that occurred on August 22nd at a large block of business premises between Cannon Street and King William Street, E.C., show, respectively, the effects of the fire in the confined space of a kind of light-well, and the appearance of (1) glazed bricks, and (2) glazed tiles after subjection to this ordeal. It will be noticed that the defacement of the glazed bricks is very thorough, and that some of the tiles have dropped out. The fire appears to have started in a basement, and, when it was first observed, had spread through the lower part of buildings extending 150ft. in one direction and 70ft. in another, and Mr. S. G. Gamble, who was temporarily in charge of the Fire Brigade, set on a force of seventeen steamers, three horsed escapes, four long ladders, motor hose tenders, and 120 firemen. Three large buildings, occupied by about thirty different firms, were "well alight" when the brigade got to work, and the firemen were mainly concerned in preventing extension to surrounding buildings. In this object they were extremely successful, and but for their activity and skill the fire might have assumed enormous proportions. As it was, the damage was mainly confined to two buildings in Abchurch Lane, and one in Cannon Street, which were burnt out. These buildings were five or six storeys high.

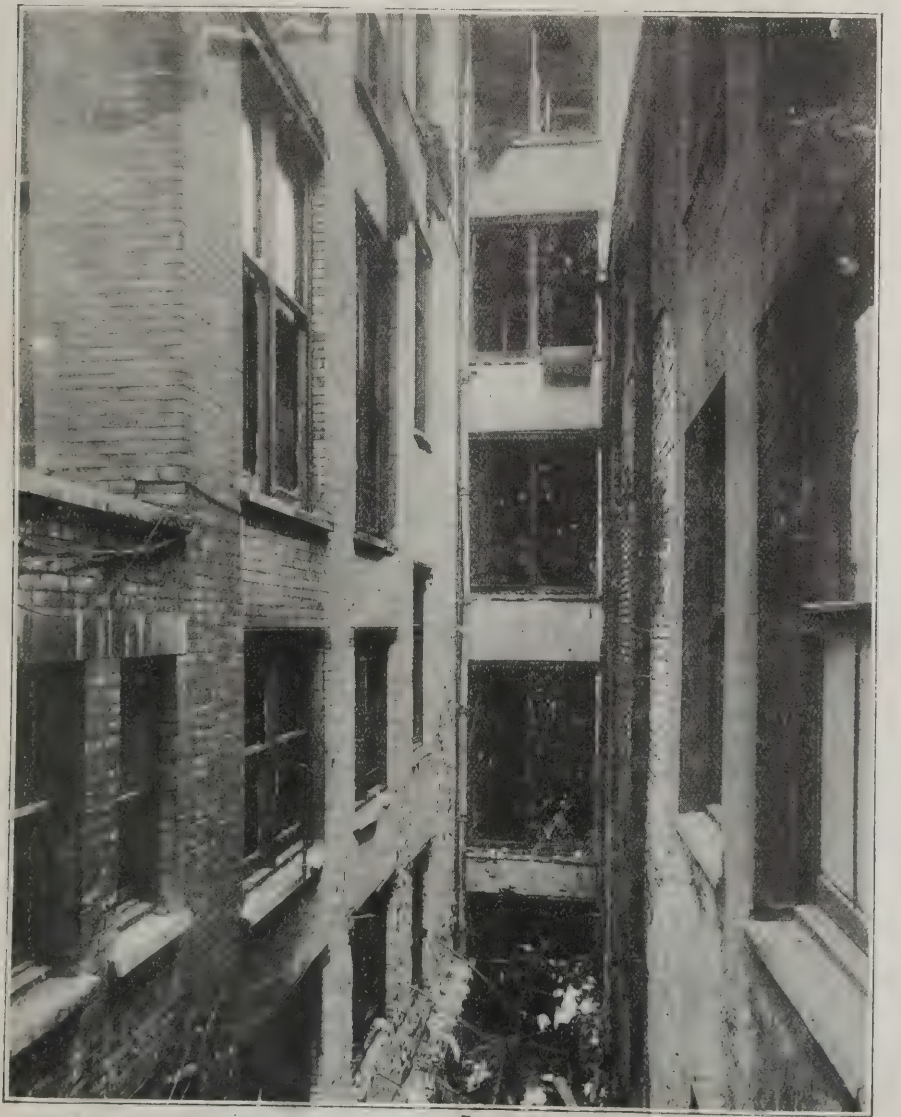


Photo: Bolak.

THE EFFECT OF FIRE IN NARROW LIGHT-WELLS AS EXEMPLIFIED IN THE CASE OF THE CANNON STREET FIRE.

This fire, which occurred in a basement café, burnt through the skylight, and affected no fewer than fifty-five offices lit from the court above.

FIREPROOFING COUNTRY HOUSES.

Mr. Frederick Squires, who, with his partner, Mr. Wynkoop, is doing a great deal of work in the erection of fireproof country houses in the United States, has published an interesting description of the methods that his firm is pursuing. He admits that tile, in common with concrete and other materials, is probably still far from its ultimate development, and that many of its qualities are not yet fully understood. Dampness is perhaps its worst enemy, and in order to avoid it the greatest care is required in the method of constructing doors and windows in tile walls. The sill is especially vulnerable, owing to the lack of firring.

In general, a fireproof house, be its walls of brick or tile, has a concrete foundation up to the underside of the first floor beams. Spans are best kept down to about sixteen feet, interior bearing walls carrying the beam ends. With a little adjustment in plan these bearing walls may be made to carry up through the building. Where openings are wanted, concrete girders may take the place of the walls, and, if too much weight is thereby concentrated, their ends may be carried on concrete piers instead of tile walls, although this is seldom required. Pipe locations should be very carefully studied, as carelessness in this way may result in cutting which will seriously reduce the strength of the structure. The following is a part of tile specification for a country house, and is quite typical.

Concrete floor beams.—All floor beams to be 4in. by 8in., of concrete, 1, 2, 4 and reinforced with one $\frac{5}{8}$in. twisted iron rod secured in place one inch from bottom by nailing to blocks in form. These rods to be bent up at 45 degrees at a point six inches from their bearing, and to run to within one inch of the top of beam and to continue parallel with the top of the beam to the outside of its bearing. All beams to follow framing plans provided by architects, which plans will show sizes of girders, lintels and all structural concrete members.

On top of floors lay sleepers at right angles to beams and bed in cinder concrete.

All lintels that carry ends of floor beams to be 12in. deep by the thickness of the wall and to be 12in. longer than the width of the opening and reinforced as specified for floor beams.

Sills.—All sills to be of concrete cast on the ground and to have a drip and to be detailed on top to fit a rebated wooden sill.

Terra-cotta Tile.—No bearing wall, outside wall or floor to be built of tile less than 8in. thick. Non-bearing partitions to be built of 3in. tile. Window and outside door frames to be detailed with a strip on the outside which will bed in the lintel at the top and will fit between 4in. and 3in. tile, which will form the jambs. Frames to be provided with a bevelled strip on outside casing, which will be removed after stucco has been applied, the space caulked with oakum and the joint covered with a mould. The sills to be rebated on the bottom to cover the rebate in the cast concrete sill and for a weather-proof joint.

All interior and exterior frames to be built with the masonry as it goes up. Interior openings to be formed with wood bucks the width of the tile wall in which they occur.

Of course, there are many forms of steel reinforcement which could very well be substituted for the twisted bar specified above. The designer has a wide range from which to make his selection, and each form has its advocates.

Solid brick exterior walls may take the place of terra-cotta tile, and this is still required by some departments, as Manhattan and Brooklyn.

It was through the Church of St. Luke the Evangelist that the firm got its idea of building fireproof buildings. This building is of brick with a hollow wall and a brick interior and tile and concrete floors. This construction gave such an impression of solidity and permanence that it was shortly followed by the Interlaken house, but by that time the architects had learned that by using tile they could lay their hollow wall twelve inches at a time and all in one piece.

The building departments of most of the towns where these architects have built have accepted fireproof construction after investigation, and in many cases have welcomed it in the hope that it would displace frame. Contractors, whenever they have been thorough workmen, have found no great difficulty in mastering the idea, and some of the firm's best executed buildings have been the first attempt in this line of clever local masons.

Mr. Squires concludes his interesting article (which appears in "The American Architect" for August 11th) with the observation that if good contractors will give fireproof materials earnest thought, well-trained architects will give them careful study, and owners will pay a higher price for a superior article, they will, between them, produce buildings of such a character that everybody will be glad that they can't be burned down.

According to a German trade paper, reinforced concrete construction has hitherto made but little progress in Germany as compared with the great strides that have been taken in other countries, the municipal authorities of the Fatherland having opposed it under all sorts of more or less frivolous pretexts. This opposition, however, now shows welcome signs of yielding steadily, as it is in Great Britain, before the clear demonstrations of the manifest advantages of this form of construction for certain classes of buildings.

Fire Prevention Notes.

Private Fire Brigades. The servants at Windsor Castle, who number nearly a hundred, are being instructed in the duties of firemen. Chief Officer Starie, of the Royal Fire Brigade, is drilling them in sections, and they are rapidly becoming proficient. As this announcement has been made in the daily Press, it is presumptively news. Yet one would have supposed, as a matter of course, that a well-drilled domestic fire brigade had long been regarded as an indispensable part of the equipment of all the royal palaces, as well as of all public buildings, institutions, clubs, schools—in fact, in all large buildings where a few or many men are available for systematic instruction in the methods for suppressing outbreaks of fire, and of using fire-escape apparatus. We can hardly believe, therefore, that the amateur fire brigade at so important a building as Windsor Castle is an innovation. The newspaper item referred to was probably suggested by improved organisation of an existing brigade. In any case, the news is very welcome; the example of Royalty being so much more potent than all the precepts of experts. Private fire brigades are doing, in a quiet way, an enormous amount of good work in the prompt suppression of incipient outbreaks.

Fire Insurance Surveying for "Stickit" Architects. In the current issue of a certain popular weekly periodical there is an article headed, "An interesting Profession: Fire Insurance Surveying." The duties of the surveyor are tersely summarised. He inspects buildings covered by the company he represents, draws up plans and reports of the premises, details processes of manufacture, points out defects in provision against fire risks and suggests remedies, and examines and tests appliances for the extinction of fire. The occupation is said to possess considerable variety and interest, sometimes taking the surveyor far afield—even on to the Continent and into the Colonies. The work is fairly well paid. A surveyor with mature experience receives a salary of anything from £200 to £500, though before he attains to the requisite degree of ripeness his salary may be "anything" (or perhaps nothing) up to the giddy height of £20 a year, "increasing at the rate of £10 per annum." The aspirant to this career should enter some insurance office as a junior, keep his eyes very wide open, study the journals of the Insurance Institute, practise plan-drawing, and acquire some knowledge of building construction. Whether or not it is absolutely necessary to "go in on the ground floor" does not appear. If competence, actual or potential, is a sufficient passport, here is a career to which the unemployed or underpaid architect's assistant might well turn in the forlorn hope that it would give him brighter prospects than the lamentably overcrowded profession in which he may happen to find himself somewhat badly bunkered. The article to which reference has been made appears in "T.P.'s Weekly" for August 27th. In venturing to develop from it the hint just given, we feel bound to add the reminder that, in this congested country, it is altogether beyond probability that the one profession for which there is a dearth of candidates is that of fire-insurance surveyor!

Three Big Fires. The great fire at Glasgow spread with such amazing rapidity, and was so completely destructive—leaving, in the buildings chiefly involved, hardly one stone standing on another—as to suggest the supreme importance of arming authorities with power to insist on the adoption—at least in the great buildings of great cities—of every known and practicable means of preventing such catastrophes. It should be insisted that every compartment of such buildings should be rendered as far as possible insular or self-contained, so that any outbreak could be confined to the point of origin, and that the combustible materials in it should be rigidly restricted to the movable contents—such as the stores of stationery, wines and spirits, and provisions, with which some of the Glasgow buildings are stated to have been replete—and should certainly not include the materials of construction, which should sturdily resist fire instead of joining with a light heart in the general conflagration. The necessarily extensive rebuilding should of course embody the latest fire-resisting principles, but the public, whose property and lives depend to some extent upon the issue, are too ill-informed and too apathetic in such matters to know or care whether or not their interests are being efficiently safeguarded. The more recent fire in Cannon Street, London, might easily have covered a much larger area but for the splendid energy and skill of Mr. Gamble and his merry men. Perhaps the inquest on this fire may bring out more points than are at present available for consideration. A properly prepared digest of these enquiries should supply valuable data for the students of fire prevention; but the newspaper reports of them are so exceedingly meagre and scanty as to be almost entirely valueless from this point of view.

Tile and Concrete Fireproofing. There is being waged in the States, it appears, an internecine war between rival material interests. Upon one point only are the rivals agreed, and that is that the man of property has got to have his house fireproofed, whether he wants it or not. The strife begins in arranging the details of this very desirable consummation. Of the one party it is said that it must be done with bricks and tiles; of the other, that concrete is your only ware. The noted architectural firm of Squires and Wynkoop are incurring the love or the hatred of both parties by using both classes of material in conjunction. Mr. Frederick Squires boldly lays claim to a fundamental art value for the resultant building—that of simplicity. The materials, he says, are more structural than those in which the architect has been accustomed to work, and the result is a more direct and simple building than his previous efforts. "The natural avoidance of wood decoration in a fireproof house," he continues, "has worked wonders in simplifying exterior and interior. The fact that the building is apt to stand for a long time makes for a simpler and thus for a better country-house architecture." The illustrations that he gives in "The American Architect" of houses that he has built of this material certainly look comely and simple; but he solemnly warns his architectural brethren who are as yet without experience in this system of construction, that the appearance of extreme simplicity is apt to be very misleading in any inferences as to cost; and has led many a contractor astray in his figures. That the building is much more costly than it looks is unfortunate, surely, with respect to the equanimity of the client. He always thinks that a building is more costly than it looks; and

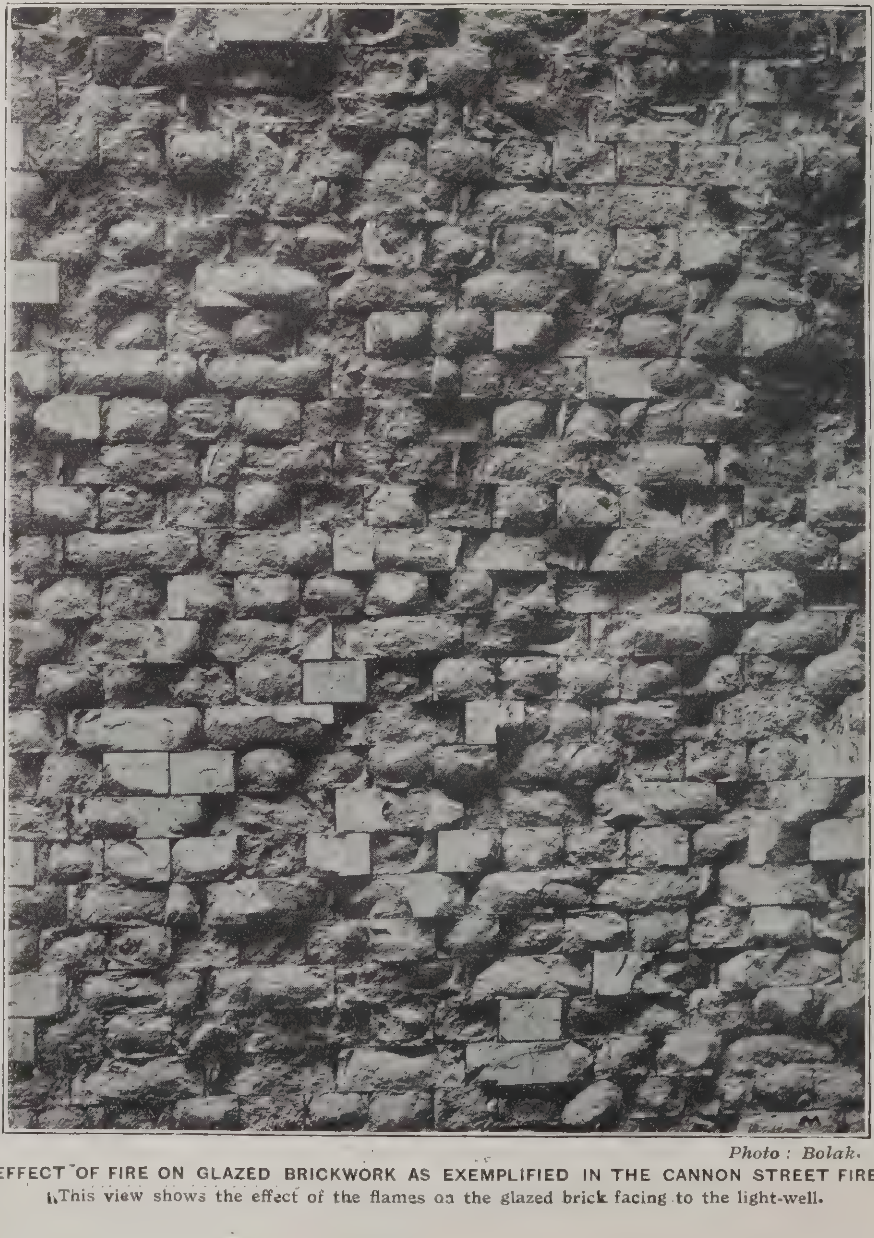


Photo: Bolak.

EFFECT OF FIRE ON GLAZED BRICKWORK AS EXEMPLIFIED IN THE CANNON STREET FIRE.

This view shows the effect of the flames on the glazed brick facing to the light-well.

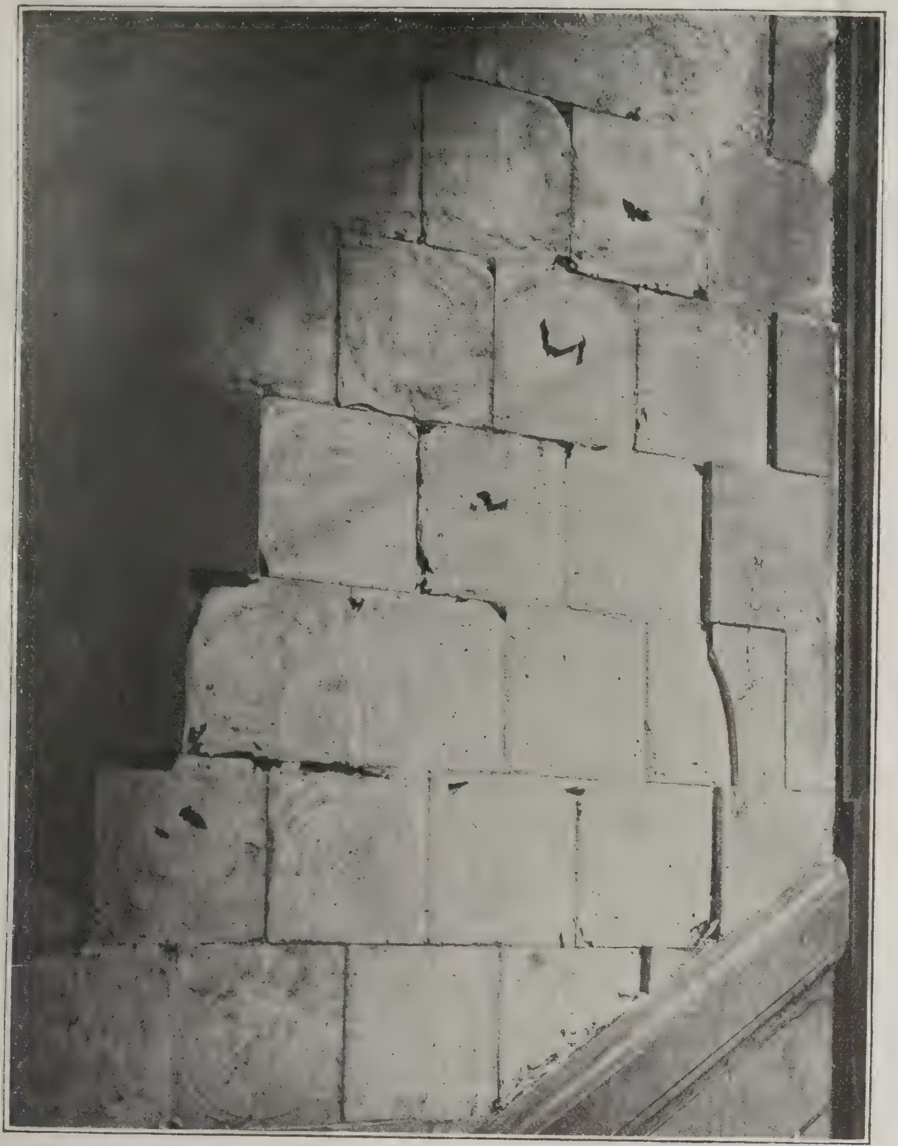


Photo: Bolak.

THE EFFECT OF FIRE ON GLAZED TILE WORK, AS EXEMPLIFIED IN THE CANNON STREET FIRE.

This view shows the effect on tiles lining one of the staircases.

any system that tends to heighten this inconvenient illusion is severely handicapped in the struggle for popularity. Still any system that ensures a dwelling that is at once comely and fireproof, and of which actual examples are in existence, is worthy of close attention, and we have therefore much pleasure in giving, on another page, some particulars of Messrs. Squires and Wynkoop's tile-concrete fireproof houses.

Printing Office Fire Risks. The paper by Mr. Ralph Hazell, on fire risks in printing offices, which we reproduce in another part of the present issue, is as it were illuminated by a great fire that occurred on Sunday last at Messrs. McCorquodale and Co.'s extensive printing works in Cardington Street, Euston, N.W. The damage, which is said to be estimated at between £40,000 and £50,000, is stated to be fully covered by insurance, and the possession by the firm of other extensive works will no doubt prevent any serious interruption to business. Block "A" of the premises was burnt out; but it is important to notice the statement that the main block was saved by the interposition of fireproof doors.

A telegram from Krementchug, in the Government of Poltava, states that a serious fire has occurred there, and that two sawmills and ten large stacks of timber have been destroyed. A large number of dwelling-houses have also been burnt down, and about a thousand families are homeless.

* * *

An earthquake-resisting system of construction which has been patented by Professor Eugène Boermel, has steel foundations which absorb the shock buffer-fashion.

* * *

The work of preserving the Moot Hall, Dewsbury, a building that dates back to between 1250 and 1300, is at present in hand. The architect's estimate for the work is £750, but the committee, at present, are only committed to an expenditure of £600. This includes the making good of the Moot Hall and the pulling down of certain buildings adjoining, which, when removed, will leave room for a back entrance to the Church House. The Hall is to be provided with a new entrance and porch, and its ancient walls and stone-work are to be made good. A new floor will have to be laid, and the chimney, now about fourteen feet wide, has to be re-built. All the old windows are to be preserved. The principal item of expenditure which the committee have left over for the present is an oak ceiling, to cost about £100. The work is being carried out under the superintendence of Mr. A. H. Kirk, architect, in consultation with Mr. J. Bilson, of Hull, a prominent member of the Yorkshire Archæological Society.

FIRE RISKS IN PRINTING WORKS.

Dealing with the causes of fire in printing works, which are notoriously heavy fire risks, Mr. Ralph C. Hazell, in a paper read at a conference of the Federation of Master Printers, cited the following most frequently recorded causes of fires in printing works:—Faulty construction of flues, etc., hot ashes and sparks from fires, drying of materials, swinging gas brackets, and gas supplies generally, heat from gas engine exhaust pipes, and from slow-combustion stove pipes, spirit vapour coming into contact with naked lights, matches thrown upon the floor, defects in electric wiring and machinery, spontaneous combustion of oily rags, and fire transmitted from adjoining premises.

Mr. Hazell then gives as the reason why fires occur more frequently in printing works than in some classes of factories, the fact that the printing trade is subject to spells of rush work and of irregular night work, with the employment of casual labour, and the consequent careless handling of inflammable materials, such as oily rags and paper. He insists, however, that to a large extent fires in printing works are preventable if only reasonable precautions are taken. He then proceeds to outline a few of these, beginning with the construction of a printer's building.

The ideal building from a fire, as well as from a manufacturing, point of view, is characterised as a ground floor structure built entirely of brick and steel, with concrete floors, and with the steel work cased in some fireproof material to prevent buckling in case of fire, but in the case of existing buildings which are the growth of a generation or more, and which are perhaps not so perfect from a fire point of view, he offers the following suggestions:—

Whenever minor alterations are made in a printing works, it is worth while for a printer whether he cannot by some slight extra expense improve his fire risk. The multiplication of match-lined partitions should be avoided. Instead of enclosing the lift well from top to bottom with match lining to keep out the draught, it should be enclosed in galvanised open wire guards, and if cold air is excluded from the ground floor, very little, if any, inconvenience will be experienced from draught on the upper floors. Whenever alterations are being made, it is worth considering whether partitions can with advantage be constructed in fireproof material instead of in wood; and when reglazing windows which overlook dangerous property the use of wired glass is also worth consideration. If a watchful eye is kept on the works carpenter, many possible fire spots can be eliminated. Spaces out of sight, in which will accumulate scraps of paper, oily rags, old boots, and fossilised fragments of lunches, should be blocked up so that no dirt can accumulate in them.

Every fire which has occurred in a printing works has had a small beginning, and a very large portion of them would not have occurred had greater attention been paid to cleanliness and order in a number of matters, each of which may appear in themselves comparatively trifling. Paper shavings and waste, instead of littering the floor indiscriminately, should be kept in proper receptacles and bagged at least once a day. Oily rags are notoriously liable to spontaneous combustion, and as long as they are required for use they should be kept in metal bins and the used-up rags burnt daily. Oil and grease should be kept in check by fitting drip trays under shafting hangers and by placing sheet zinc under all machines and upon benches where oils or inks are handled. If simple precautions such as these are insisted upon, and the few inexpensive appliances mentioned obtained, a hitherto dirty and untidy factory is in a short time transformed into a greatly improved fire risk, and at the same time an improved standard of cleanliness and order is set up which undoubtedly has a good effect upon the workpeople and the work produced.

Appliances for lighting and warming a building should be carefully considered from a fire point of view. Slow-combustion stoves, gas stoves, and similar appliances should be properly fixed in such a way that no wood work comes into contact with dangerously hot pipes. Swinging gas brackets should be carefully fixed, and all gas burners should be enclosed in wire globes. The use of flexible rubber gas piping is most undesirable. Flexible metal piping, connected at each end, not with rubber connections, but with proper screwed metal unions, should be used; moreover they are the cheapest in the end. Indiscriminate connecting of gas rings to ordinary gas burners is a very dangerous practice.

The use of matches should be strictly forbidden. Either electric lighters or wax tapers should be kept provided, and, in the latter case, a pilot for lighting the tapers should be kept constantly alight.

As to the importance of electricity as a cause of fire, provided care is taken that electric wiring and electric machinery are properly installed and maintained in good order, the risk of fire from them is very slight. On the other hand, if electric wiring is carelessly installed in such a way that cables are insufficiently insulated, or damaged by careless handling, short-circuiting, or partial breakdown to earth may occur, and thus set fire to the woodwork in the neighbourhood of the cables. Cleanliness is, in this connection as in most others, important. Users of electricity should beware of gradually increasing the load on electric cables by adding lights here and there or by substituting 32 c.p. for 16 c.p. or 8 c.p. lamps. Each individual addition is in itself trifling, but in the course of a year or two, without realising it, additions may be made which cause a serious overload on the wiring, causing over-heating, and consequent risk of fire. Paper should not be hung up to season close to the flexible wires of electric light. If a short circuit occurs in a flexible wire, the insulating material sometimes catches fire before the safety fuse has time to act, and this may easily set fire to any loose paper near.

Although printers may not consider it necessary to organise a private fire brigade amongst their workpeople, a few simple arrangements as to the duties of responsible people in case of fire should at least be made. Fire hose and water buckets must be looked to periodically, and chemical fire extinguishers specially should be tested at intervals. If a few people are made responsible for these duties, and an occasional fire drill, and possibly now and then a false alarm of fire be given, the chances of dealing with a fire promptly and effectually are greatly increased.

It is generally desirable to post in the works a few simple instructions as to means of exit, method of calling the brigade, and similar matters which need attention if a fire breaks out. If a night watchman is employed it is important to see that he clearly understands what to do under such circumstances, and his movements should be checked by a telltale clock. Perhaps the best method of keeping a night watchman awake is to give him some work to do. It cannot be too strongly insisted upon that there probably never was a fire in a printing works which could not have been extinguished without loss if a single bucket of water had been poured upon it at the right moment. Hence, any little time or trouble expended upon organisation of this kind is well invested.

Mr. Hazell concluded his paper with the following remarks on reduced insurance rates:—Discounts are allowed by the insurance companies for approved sprinkler installations with two water supplies, varying according to circumstances from 30 per cent. to 50 per cent. off the ordinary rate charged. With regard to automatic fire alarms, the insurance companies allow for them discounts varying from 10 per cent. to 25 per cent., subject to the insured providing them with an adequate supply of buckets and chemical extinguishers. It will generally be found that money spent on sprinklers or automatic fire alarms will yield in the shape of reduced fire premiums a good return on capital invested, apart altogether from their value in immensely reducing the risk of a serious fire.

Various trade insurance companies have been in existence for many years, most of which were started by members of the trade concerned. The most successful of these, such as the Millers, the Mutual Companies of New England, U.S.A., and others, have paid special attention to inducing the insured to lessen his fire risk by making improvements to his premises. The result has been that the average risk of fire in a trade has ultimately been greatly reduced, and as the companies are run for the benefit of the trade in question, the fullest possible reduction in rates has been allowed for all improvements made. The Printing Trades Insurance Company has just completed a most successful first year's trading. The company was launched under the auspices of the Master Printers' Federation, and as the capital and management are entirely in the hands of members of the printing trade, the company is virtually a mutual one. The company's surveyors, who are especially expert in printing risks, are prepared to advise intending insurers as to the best means of improving their premises, so as to reduce their fire risk and the cost of insurance, and it is anticipated that as the operations of the company are extended, great savings to the trade may be expected, and at the same time a good profit on the business may be earned for the shareholders.

Parliamentary powers having been obtained, the work of extending the Central London Railway from the Bank to Liverpool Street will be begun at once. The new line will provide for the first time a direct train service from Liverpool Street to the West End. A new subway is to be constructed giving additional access to the Bank station from the street, and the scheme includes the construction of a movable platform connecting the British Museum station of the Central London Railway with the Holborn station of the Great Northern, Piccadilly, and Brompton Railway.

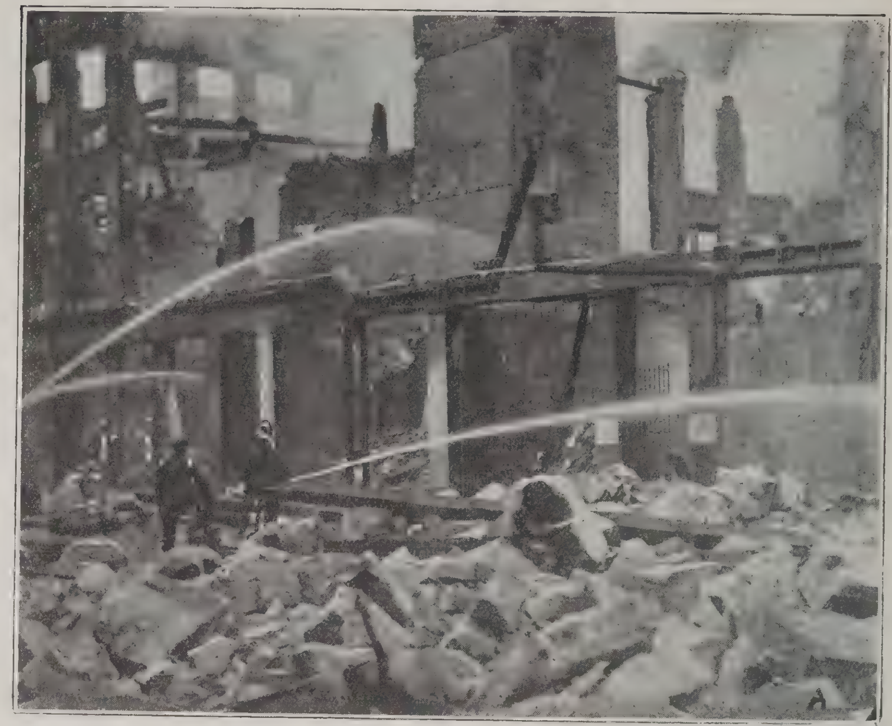


Photo: Topical.

THE GLASGOW FIRE. GENERAL VIEW OF THE RUINS, SHOWING THE EFFECT ON UNPROTECTED GIRDERS AND STANCHIONS.

The view shows the scene in Ingram Street after the fire had lasted ten hours.

THE GREAT FIRE AT GLASGOW.

The devastating fire which broke out shortly after midnight on August 17th, in the heart of Glasgow, and immediately opposite the headquarters of the City Fire Brigade, was first noticed in a stone building of four storeys, with a frontage of 80 yards in Ingram Street. The block of buildings destroyed was bounded on the west by the narrow thoroughfare of Shuttle Street, on the east by High Street, where the Cathedral stands, and on the north by College Street; the whole area occupied by the destroyed block consisting of about 6,000 square yards. Within the main building were the warehouses of twenty wholesale produce merchants, the wares including wines, stationery, boots and shoes, and pork. The Albion Halls, in College Street, the central meeting-place of all the trade organisations of the city, were reduced to ruins; and surrounding buildings, including the fire station itself, were in great danger, and had to be kept drenched with water to protect them against the intense heat. Within an hour of the first alarm, the top storey of the building in which the fire originated fell into the street, in which the mass of masonry, as shown in the accompanying illustrations, must have endangered the lives of the firemen as it fell, and must have greatly hampered their movements as it lay on the ground. The firemen were able to save the business premises on the opposite side of the narrow thoroughfare known as Shuttle Street, although the flames reached right across; but the Albion Halls could not be preserved, because, according to a local reporter, "the floors and fittings in the halls and rooms were all of wood." The affected portions of Ingram Street and College Street had each a frontage of 237ft., while the frontage to Shuttle Street was 198ft.; the average height of the blocks being 74ft. The buildings on this area were utterly destroyed within a period of about twelve hours from the first observation of the outbreak; the fragments that were left standing having to be at once demolished because of their extremely dangerous condition.

The handsome Central Fire Station had all its front windows broken, and was much damaged by fire and water. One curious incident was that a huge block of stone from the burning building opposite was hurled across the street through the window of the firemaster's office, and struck the wall on the far side of the room, smashing some pictures that were hanging there. The damage was at first estimated at £250,000; but the actual cost has been since assumed to reach about one-half that amount. Nevertheless, the fire is probably the greatest that Glasgow has ever known.

CANONS OF TASTE IN STREET ARCHITECTURE.

The Right Hon. James Bryce, British Ambassador at Washington, who is not only a distinguished publicist and man of letters, but has also a very pretty taste in the arts, was invited to address a convention of the National Academy of Art at Washington, and a portion of his speech dealt in a very interesting way with certain points of architectural interest. Mr. Bryce said:

I was asked, some days ago, to tell you what has been done in Great Britain in the way of bringing general canons of architectural taste to bear upon public buildings, and especially what statutes, or local regulations, existed preventing the unfortunate results which arise from erecting side by side buildings in different styles and of different heights, each marring the effect of the other. There was very little time to ascertain what our laws in Great Britain were on the subject. However, I wrote at once to a friend there, and I received, by cable, the answer which I expected, namely, that we have not got those statutes and regulations. This is very melancholy, because I should have been in a very strong position if I had been able to come before you and tell you what we had done in England, holding it up as a model for you! It would have been a beautiful thing for the old country, which claims to have done something in originating institutions which have been developed further in this country, if it had been able to pose as a leader and standard-bearer in the cultivation of art in its public aspects and in the bringing of legal weight to bear upon the artistic growth of cities! Unfortunately, that is not so.

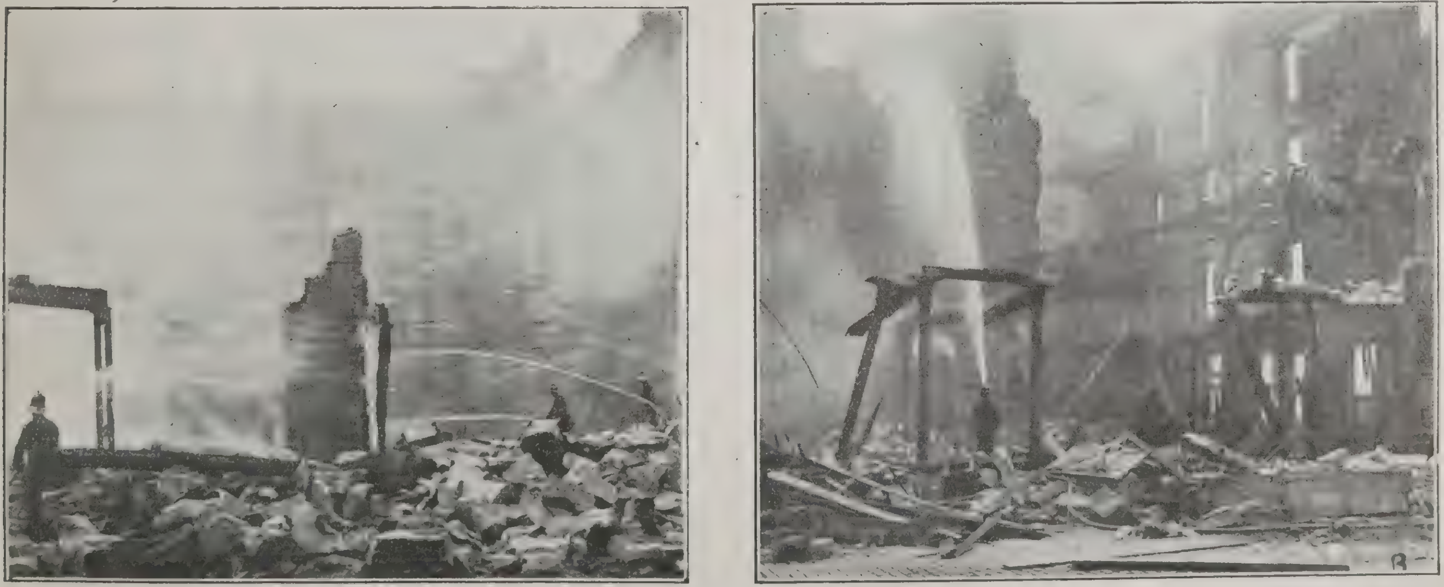
I will tell you, Mr. President, as far as my recollection goes, what are the only ways in which we do incidentally prevent the disfiguring of cities by improper buildings, but, meantime, let me tell you that those who love art and taste in England, and in particular the organisations of architects themselves, have for a long time past been endeavouring to obtain some public regulation of streets and buildings. So far they have failed. They have failed for an obvious reason, which no doubt would be operative here also. They have supposed that regulations by public authority would infringe what are called the sacred rights of property. Now, property is a very good thing in its way, but property sometimes carries its demands a little too far, and that, because the right of ownership of a piece of land is vested in an individual he should therefore have the right to put up buildings, which may not only destroy the general beauty of a street or square, but may also destroy the beauty and effectiveness of buildings directly adjoining them which some man of better taste and higher public spirit has erected, with a view to the public enjoyment, as well as his own, would seem to be going a little too far. You may recall the words of Madame Roland at the time of the French Revolution, who said, "O, Liberty, what crimes are committed in thy name!" And I feel sometimes inclined, when I see the extravagant demands that are made in the name of property, to say, "O, property, what atrocities are justified in thy name!"

It seems unlikely that for some time to come we can, at any rate by public authority, secure that which we may call the censorship or supervision of the erection, style, design and size of buildings to be erected in streets and squares, which I understand the members of this association desire. But one must not despair of the future. After all, there is some progress marked by this mere fact that many more people desire the thing now than desired it formerly. There is, furthermore, this consolation, which we may apply to our minds, when we regret the absence of legal regulation—that if legal regulation had existed in former times we might have had things done which we should now regret. We might have had whole lines of streets, or large squares and circles built in styles which we should now think uninteresting and monotonous, merely because they represented the particular dominant taste and tendency of a particular time. Note, for instance, what was done by Baron Haussmann when he built so large a part of the great thoroughfares of Paris in the day of Louis Napoleon. Most of us would now feel that those long lines of boulevards are monotonous and, indeed, many people would call them dull and soulless. Certainly there is far too much of that sort of thing in Paris. That was the style of the time. Haussmann was able to carry out the ideas which he, or somebody else for him, endeavoured to apply, and the consquence was that the picturesqueness and charm of old Paris vanished. A great many of its quaint, winding streets, which carried one back to the days of the Renaissance, and which we would gladly have preserved, then made way for the tame and conventionally ornate, but essentially wearisome, style which Haussman applied to those great Parisian thoroughfares.

We cannot be too sure that something of the same kind would not happen again; and, therefore, perhaps, we must not too much lament the unchartered freedom, the unqualified and absolute license which is now enjoyed, because it, at any rate, does preserve a certain measure of variety. And when taste grows better it may be that everyone putting up a building in a street will think a little more than he has hitherto thought of its harmony with the adjoining buildings.

As you know, there is one difference between the condition in London and the condition here. In your American cities, as a rule, the man owns his own land and puts his own house upon it; or even if the builder builds the house upon speculation and afterwards sells it, it is generally not done in large stretches of houses. In London, on the other hand, the existence of large estates, each owned by a great landlord, has led to the erection of long stretches of houses, sometimes perhaps half a quarter of a mile or even a quarter of a mile, all upon some uniform plan. The architect of the estate controls the whole affair, and what is erected follows the designs he suggests or approves. You have not that here, and therefore you see the results in the fact that in London many of the streets belonging to these large estates are exceedingly monotonous, and such streets as Gower Street or Harley Street, for instance, are as dull as can be. Here, and in Washington, in particular, on the other hand, you have the very opposite extreme. Everybody does what is right in his own eyes. He builds his own house in his own way, and you very often have the most incongruous styles or sizes close together. At the same time you have a certain amount of variety, which, on the whole, is better than dreary uniformity.

On Monday last, when the House of Commons went into committee on the Housing and Town Planning Bill, Sir F. Banbury, moving the omission of the clause which makes Part 3 of the Working Classes Act, 1890, compulsory, declared that this made the President of the L.G.B. a sort of emperor; a kind of Julius Cæsar, who of his own sweet will should direct the destinies of his less fortunate fellow subjects. Mr. Burns replied that the clause had the exactly opposite effect!



Photos: Topical.

THE GREAT FIRE AT GLASGOW.
These views show the effects after the fire had lasted twelve hours.

Societies and Institutions.

Architectural Association School of Architecture.

The "Curriculum" of this school for the session 1909-10 forms a booklet of seventy-eight pages, to say nothing of the advertisements. The master, Mr. H. P. G. Maule, F.R.I.B.A., is assisted in the Day School by Messrs. H. A. Douglass, A.R.I.B.A., L. M. Gotch, A.R.I.B.A., H. L. Samson, Alan Potter, Alan L. Snow, and Guy Church, A.R.I.B.A. Mr. Ernest Newton, F.R.I.B.A., has been appointed by the Board of Architectural Education to act as special visitor, and will keep himself in touch with the work of the school, and confer with the masters from time to time as to the progress made and the methods adopted. The Master of the Evening School is Mr. C. E. Varndell, A.R.I.B.A., who is assisted by Mr. A. C. Dickie, A.R.I.B.A., and Mr. J. B. Scott, with about a dozen lecturers and instructors. Syllabuses, time-tables, lists of text-books, and dates of meetings of the Architectural Association are included in the booklet, for which application should be made to the secretary, Mr. S. G. Driver, F.C.I.S., 18, Tufton Street, Westminster.

Committee on Ancient Earthworks.

The Committee on Ancient Earthworks and Fortified Enclosures (chairman, Lord Balcarres, M.P.; hon. secretary, Mr. A. G. Chater, 41, Porchester Square, W.), have favoured us with a copy of the report prepared for presentation to the Congress of Archæological Societies held in July. The Committee report a steady growth of interest in ancient fortifications, as shown by measures taken for the preservation, exploration, and recording of these remains. It is noticed, however, that many large areas, such as Buckinghamshire, Norfolk, and Surrey, are still neglected. A Royal Commission on Welsh monuments was appointed in August, 1908, and in October, 1908, the Government appointed a Royal Commission to make an inventory of the ancient and historical monuments of England, and to specify those which seem most worthy of preservation, while a sub-commission has been appointed to deal with earthworks and pre-Roman remains. The county of Hertford is now being surveyed, and other counties will follow in turn. The officers in charge of the revision of the Ordnance Survey on the scale of 25ins. to the mile have agreed to keep the Committee informed of the position of their field parties, in order that any earthworks hitherto omitted or insufficiently shown may be made good in the next revision. Many instances of preservation, of destruction, and of exploration are chronicled; and under the second of these sections it is mentioned that many instances have been noticed of the mutilation of ramparts and ditches through the utilisation of ancient earthworks in the laying-out of golf courses, and that this practice is apparently increasing; the destruction being in most cases due, apparently, to ignorance of the scientific value and historical interest of the remains. Another *bizarre* incident was the mutilation last year of the walls of the hill fortress at Conway Mountain by Territorials, who entrenched themselves behind the walls. Quarriers and road-menders have shown similar disregard for the monuments of antiquity. Among the interesting items recorded as to exploration, it is mentioned that in the spring of the present year the Society of Antiquaries conducted an exploration on the site of Christ's Hospital, under the direction of Mr. Philip Norman, LL.D., and Mr. Francis W. Reader, with the object of finding remains of the angle bastion of the city wall, where the latter, after running due west, turned southwards in the direction of Newgate. A considerable portion of the north side of the bastion was uncovered, together with a piece of the city wall. The latter showed masonry of the same character as in other parts of the wall that have been examined; and the bastion proved to be of later date than the wall itself. Signs of an external ditch were looked for, but the indications were those of a running stream at the foot of the wall. The important excavations at Corbridge, at Maumbury Ring, and others elsewhere, are also noticed, and a bibliography of the year's literature on the subject is appended.

Birmingham Municipal School of Art: School of Architecture.

A Day School of Architecture has been founded at the Municipal School of Art, Birmingham.

The object is to provide architectural students in the Midlands with a thorough training in all the branches of their profession, and to prepare them for the examinations of the Royal Institute of British Architects.

The school course will be spread over four or five years. It is intended that the first two years shall be spent at day classes, and that they shall take the place of the first two years of articled pupilage. The latter two or three years will be spent at evening classes, and will run concurrently with articled pupilage.

The syllabus will be as follows:—First year: Lectures on architectural history, building construction, elementary physics and geometry; demonstrations and practical work in stone-masonry, carpentry and bricklaying; simple planning, elementary design (doors, roofs, windows, etc.); perspective; drawing and lettering. Second year: Studies in ancient architecture, including measuring; practical work; lectures on the historic styles and on iron and steel construction, physics, etc.; design. Third and fourth years: Mainly design and advanced physics and kindred subjects. It is hoped that third and fourth year students will be able to take some of their science subjects and carry out tests as to strength of materials, etc., at the Birmingham University. The machinery and equipment possessed by the University for this purpose is quite unique.

The teaching staff is as follows:—General director, J. L. Ball; assistant director and lecturer in design, E. F. Reynolds (Sloane Medallist, 1903); lecturer in history, W. H. Bidlake, M.A., A.R.I.B.A. (Pugin Scholar, 1885); lecturer in physics, etc., F. B. Andrews, A.R.I.B.A., assistant, John B. Surman, A.R.I.B.A. The school will meet daily, from 9 to 5 (Saturdays, 9 to 1), and the first session will commence on Monday, September 13th, 1909.

It is anticipated that students who follow the full course will be exempted from the Intermediate Examination of the R.I.B.A.

Further information will be supplied upon application to Mr. A. H. Leaney, secretary.

Our Plate.

Vicarage in the English Lake District.

The plans and perspective drawing show the first design for the new vicarage at Winster. The cost had to be reduced somewhat, and this led to a slight modification of the plans before the work commenced.

The house occupies an elevated site on the eastern slopes at the head of the Winster valley. The ground falls rapidly from N.E. to S.W. Rising ground and plantations afford a protection from the cold N. and N.E. winds; from all other points the views over hill and valley are very extensive, with, in the distant south, glimpses of Morecambe Bay (fourteen miles away).

The main drive approaches from the S.E., and the carriage court forms a wide terrace enclosed by walls of local stone with a wide flight of steps descending to the tennis lawn. The western terrace is a continuation of this, but is much less in width.

The whole of the walls are of local stone from a quarry adjoining. The house is roughcast and whitewashed externally, and the roof is covered with Westmorland green slates.

The windows, external doors, and main stairway are of English oak; the whole of the remaining joiners' work is of best yellow pine, painted white throughout the private portion.

The whole house is lighted with Cox's patent air gas, installed by Messrs. J. K. Thornborough and Co., of Windermere.

Mr. Joseph Braithwaite, of Windermere, is the general contractor. Messrs. Doulton and Co., have supplied the sanitary fittings.

Mr. W. L. Dolman, of Windermere, is the architect, and the pen-and-ink perspective drawing is by his brother, Mr. Lewis J. Dolman.

House on Boyle Farm Estate, Thames Ditton.

This house has recently been erected on the historical estate of Boyle Farm at Thames Ditton. It is built of local red sand-faced bricks, and half timber work, left rough from the saw and plastered smooth between the timbers. The roofs are covered with red sand-faced tiles. The accommodation provides dining-room, large drawing-room, lounge sitting hall, and the usual offices on the ground floor, and five large bedrooms, and bath-rooms on the first floor.

The architect is Mr. A. Jessop Hardwick, F.R.I.B.A., of Eagle Chambers, Kingston-on-Thames, and the contractor is Mr. S. Hurst, of Chiswick.

Our Illustrations.

Houses near Golder's Green.

The houses shown on p. 163 are typical of a series of buildings, both detached and semi-detached, to be erected near Golder's Green by Messrs. Spiers and Son, of St. John's Wood. No two sets of plans are alike, some being a little unusual in arrangement, but all elevations suggest the same period. The facings are Luton bricks, with red sand-faced long-and-short work, and red rubbed arches. Black sand-faced roof tiles are to be used throughout. All the joinery work is painted deal, except the front doors, which are mahogany. The halls are all tiled with black and white marble, the entrances in front gardens with old York paving, and the gates are of wrought iron. The architect is Mr. John W. Rhodes, Mitre Court Chambers, Temple, E.C.

Six Labourers' Cottages, Heath End Bucks

In these cottages, which were built for Mr. O. A. Keane, Wycombe, the accommodation comprises four rooms in each, with coals, stores, pantry, etc., and a small bath in scullery is provided. The bricks are local made reds and purples. The walls on the ground floor are 11¼ins. hollow, and 9ins. with lime rough-cast. Brick-on-edge coping and tile creasing roof are to be covered with hand-made tiles, and large ornamental W.I. brackets support the gutters, with wide projection to the eaves. Earth closets are to be fixed, and the rain water is to be run into large oak butts. All external woodwork (except sashes, doors, and frames) is to be left rough, and treated with solignum. The estimated cost is £798.

White City Exhibition Building.

This building has recently been erected in the Machinery Hall, Stand 49, at the Imperial International Exhibition, Shepherd's Bush. The walls are constructed inside and out with fibro-cement slabs, with a perfectly plain surface, which can be treated in any decorative way desired. It is roofed with Buttermere green slates in diminishing courses, the chimneys, where emerging from the roof, being rough-casted. The living-room, with its old-time ingle-nook, roofed over at 7ft. from floor, open timbered ceiling, and other features, is noteworthy. The cost of the building erected anywhere in England is £236 in client's foundations. The contractors are the Alnwick Foundry and Engineering Co., Alnwick, and 52, Queen Victoria Street, the architect being Mr. Andrew Sell, 3, Howick Street, Alnwick.

Messrs. Henry Lovatt (Limited), of Wolverhampton, have secured the contract for the erection of new barracks for the Egyptian Government at Abbassia, near Cairo. The barracks will take three and a half years to build.

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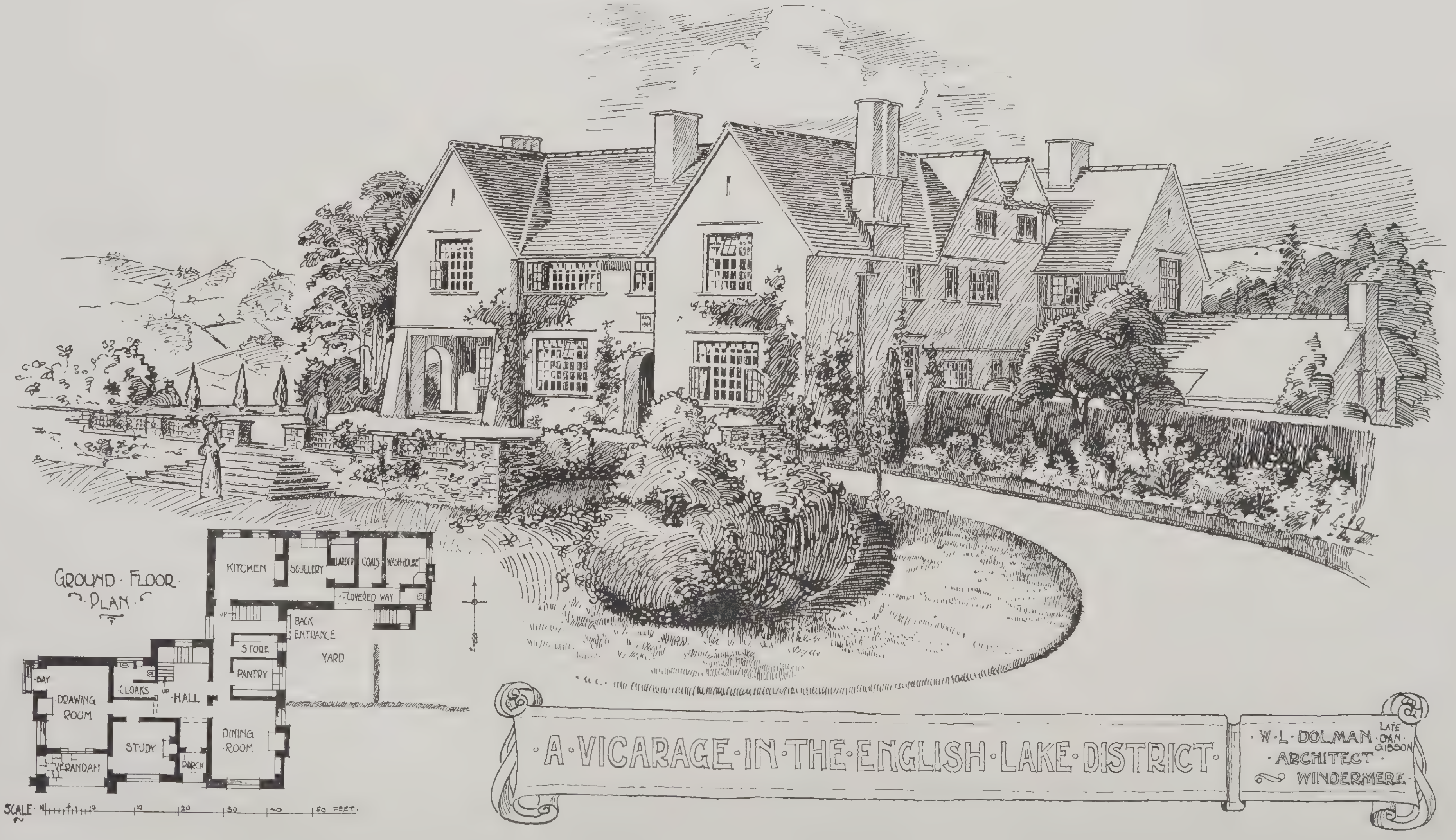
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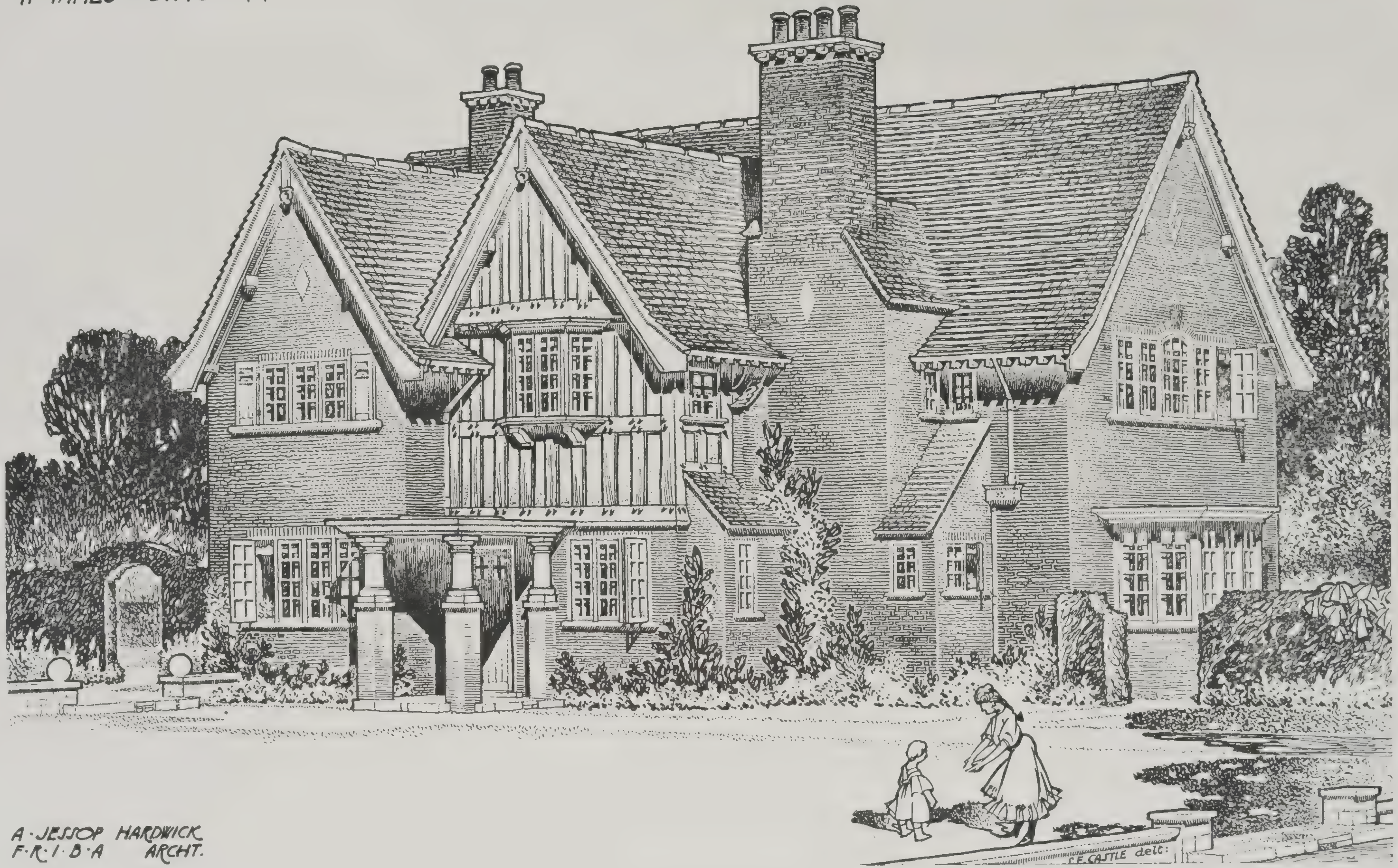
HOUSE ON THE NEW
BOYLE FARM ESTATE
THAMES DITTON



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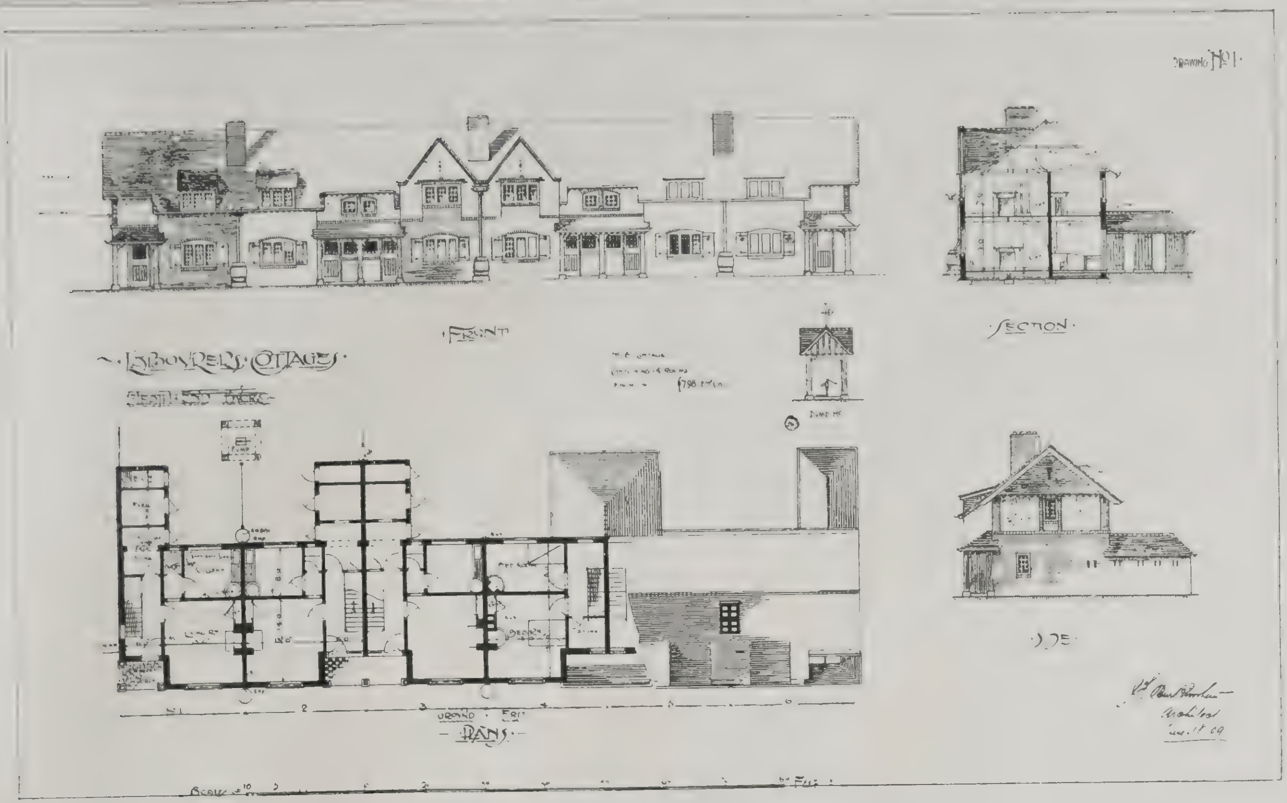


SIX LABOURERS' COTTAGES, HEATH END, BUCKS. J. F. BURKINSHAW, ARCHITECT.

In these four-room cottages, local-made red and purple bricks have been used, and the roofs are to be covered with handmade tiles. Large ornamental wrought-iron brackets support the gutters, with wide projections to the eaves.

Correspondence.

[The Editor declines responsibility for the statements made by correspondents.]

Hardships of Tendering.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I was much interested in your article in the Journal for August 25th, headed "Hardships of Tendering," and consider your suggestion, "that the tender to be accepted should not be the lowest, but that which approximates most closely to the mean of all the tenders received," is a most excellent one, and ought to receive serious attention from architects especially.

In most cases the great difference between the top and bottom tenders ought to convince the architect that there is something seriously wrong, and he should hesitate to advise his client or committee, as the case may be, to accept a tender which is so obviously underpriced, as in all probability he has worked out a rough estimate of the probable cost before asking for tenders.

Some time ago I tendered for a considerable contract in my department. The work had all to be done to a carefully prepared and stringent specification, and the names of the firms whose goods had to be used being given, all the competitors were upon the same basis, and it was simply a question of the margin of profit.

On looking over the list of some 20 tenders, most of them from well-known firms, it was evident that there was a serious error in the amount of the tender at the bottom of the list, which was accepted.

On comparing this sum with my own prime cost, I found that it just represented the value of the material! The sequel showed the unwisdom of accepting an abnormally low tender.

It is well known that many architects do advise their clients to accept the tender which in their opinion most fairly represents the value of the work which they propose to put into their building, and which is likely to reflect credit upon themselves, and give the utmost satisfaction to their clients, and if this custom could be applied more generally by the profession, we should hear less about shoddy materials and scamped workmanship.

HEATING ENGINEER.

London, S.W.

Is Joinery a Declining Trade?

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Is joinery a declining trade? is a question that more than one craftsman of the present day asks himself, and does not fail to point to the introduction of machinery as one of the principal causes of such depression. Let that joiner or builder, or architect, whatever he may be, answer satisfactorily to himself the further question, has machinery ruined any trade? Has it ruined the cotton trade, the iron trade, or, indeed, any manufacturing concern?

It may possibly have diverted it for a time into other channels; I have often heard it stated that machinery has spoilt all artistic feeling as regards woodcraft. Surely this is erroneous. There can be no need of art and beauty being destroyed by the labour being lightened; for that is the chief idea of employing machinery. The design should not be made to fit the machine, but the machine employed to carry out the design. This chronic misuse of machinery is not so much amongst the large firms as by the little builder. I will quote from my own experience of such.

We will say our builder has just taken to the idea of machinery in his shop. He has purchased, say, a circular saw, planer, and moulder combined, and a band saw. More than likely, where these were bought, he was shown in how many minutes (or how few) a door stile could be planed true. He saw the circular saw ploughing its way through a batten or deal. He listened to the eloquent tongue of the seller. Naturally he goes home fancying he knows all about it, and dreams of future work being done at lightning speed. Oh that speed! It is that that is the cause of all bad work, machine or hand. Well, the machines being sent home, and fixed, all in good working order, he next thinks of who will work these new friends of his. Most likely there is about his yard a handy labourer, clever at anything. "Just the fellow for the circular saw," says our builder; for what skill is required to push a log? Perhaps not, Mr. Builder. Very likely he will be more pushing than skilful. For such a man as I am speaking about pushed so forcibly on a saw I was working beside once, that he broke the belt, and thus caused a delay, much to his own surprise.

To return to our machine shop. Our friend now thinks of the planer. Ah! there is a joiner in the shop—perhaps not superb at bench work, but he'll jog along all right on the machine, because the machine does the work, not he. And so on goes our builder, plunging onward, finding machinery does not pay so well as he expected. Saws run; spoil materials. Planer will not work true. Tenons all want easing by hand. Work requires extra cleaning up. And the engine—certain to be a gas engine, which the makers assured him required no attention—this will soon start playing pranks, suddenly stopping for no known reason. This being Master Knowall Jack's job, he starts unscrewing and fiddling. Very likely his master helps him at this important job. Perhaps between the two they make a little improvement; but at any rate troubles have begun, for the newness has worn off. Saws are not so perfect. Planer knives are thick, and our scrap mechanics do not know how to regulate these things.

Now if (always an if) our builder had in the first place employed a skilled expert, his machines would still be running at their best, and the output would be as high as possible. Not that I intend to say joiners are not machinists, for I always contend no man is more suitable for machine joinery than a skilful hand joiner. Still, however, he cannot expect to jump to the top of the tree at one bound. It has ever been my advice to present-day workmen to study machinery at every opportunity, for it seems that in the near future every carpenter or joiner will need to be as thoroughly conversant with machines as with hand tools. Not that hand labour can ever be entirely superseded. That is well nigh impossible. But they will have to equip themselves with a thorough all-round knowledge, and so study their machines that they know exactly what can or cannot be done on them. For instance many a joiner still thinks nothing can be done on a circular saw save ripping and perhaps a little cross-cutting. Never so much did he deceive himself, for that useful tool can be made to perform many a helpful operation in joinery; so likewise will the band-saw, although this is not so tractable to workshop rigs as the circular. Still, with the machines previously mentioned, it is possible to perform well nigh everything required in an ordinary joiners' shop. If space and funds will allow, it is far better to have separate machines than a universal woodworker. As far as they go, the universals are admirable machines, but at some time or other the circular will be wanted in a hurry just in the middle of a moulding job, and it is no joke resetting cutters for the same job.

So long as craftsmen, employers, as well as employees, look to the future of their trade, and adapt themselves to present-day requirements, there will be no fear of a decline. At present the building trade is undergoing a metamorphosis, after which no doubt it will burst out into a beautiful future. At least, this is the hope of the writer.

Arthur Castle.

Proposed New Works.

ACTON.—For purposes connected with its new public buildings, the Council has decided to apply to the Local Government Board for sanction to borrow £2,200.

BRIDLINGTON.—The proposal to widen the north end of St. John Street at an estimated cost of £670 11s. for street works only, has resulted in an application to the Local Government Board for sanction to borrow £3,400.

EPPING.—The Epping Guardians propose to erect temporary buildings at the workhouse to meet the increased pressure on the infirmary accommodation.

LIVERPOOL.—The Lancashire Asylums Board have recommended the adaptation of Seafield House for the accommodation of 345 patients, and the extension of Whittingham Asylum. The alterations at Seafield House are estimated at £14,500 or £42 per bed.

LLANDRINDOD WELLS.—A special meeting of the Urban District Council has been held to consider a letter from the Local Government Board relative to the Council's application for a loan of £10,000 for the purpose of the erection of a pavilion in the recreation ground. The Local Government Board wrote stating that whilst they saw no objection to the erection of a pavilion, they could not sanction a loan of £10,000 for the purpose. Mr. John Burns has confirmed the decision given in the Local Government Board's letter and has very strongly insisted that there should be "no frills." The Council has accepted the decision, and a modification of the scheme is under consideration.

LONDON.—The cost of a new recruiting depot, which it is proposed to erect between Great Scotland Yard and Craig's Court, Westminster, is estimated at between £25,000 and £30,000.

SOUTHPORT.—The plans of the new theatre have been before the Plans Sub-Committee of the Highway Committee, but have not yet received the approval of that body. Mr. Bertie Crewe, of London, who for many years was with Mr. Frank Matcham, is acting as joint architect in the present scheme with Mr. G. E. Tonge, of Southport.

SUTTON-COLDFIELD.—The proposed new post-office buildings to be erected on the site of the old Emmanuel College Arms Inn, Mill Street, comprise, on the ground floor a public office, a sorting room, sub-postmaster's office, postmen's, messengers' aid lady-clerks' rooms, and cycle and truck sheds. On the first floor house accommodation is provided for the sub-postmaster. The elevation to Mill Street will be carried out with stonework to the ground floor storey, the upper part being of red brick with stone dressings, surmounted by an ornamental stone entablature and balustrade. Messrs. Essex and Goodman are the architects.

Works in Progress and Completed.

ASHBOURNE.—The Duke of Devonshire recently performed the ceremony of opening the new buildings of Queen Elizabeth's Grammar School. The old Grammar School, which is now superseded, obtained its charter from Queen Elizabeth in 1585, but there is evidence that the institution itself dated a good many years further back. The idea of considering a plan for extending the old school was abandoned when the Governors were advised by the Board of Education to make provision for the education of girls as well as boys. The new buildings were designed by Mr. E. M. Longsdon, F.S.I., M.R.S.I., Bakewell, and the builder was Mr. W. Thorley, of Noding. There is accommodation for about 180 scholars, and without difficulty 200 could be received.

BOTHWELL.—A boom in the building trade appears to be in progress in this district, there being at present in course of erection a large chapel school for the R.C. community of Bothwell and Hamilton Palace Colliery districts, the probable cost being £8,000. The plans, which were prepared by Mr. W. Orr Watson, architect, 95, Bath Street, Glasgow, not only show the large chapel school now in course of erection, but also the opening up of a new street, and the erection of a chapel and presbytery on the adjoining ground. The contractors for the mason work are Messrs. Robert Park and Co., Motherwell, and for the wright work, Messrs. Allan and Baxter, Glasgow. An addition to the Convent at Bothwell for the accommodation of the local priest is also in course of erection.

In contiguity to the fountain, Bothwell, a group of buildings to be known as the Donald Institute is being erected.

Owing to the abnormal growth of Bothwell Haugh, school accommodation has been found to be quite inadequate, and schedules have been issued for the erection of a second school. The work will be proceeded with at once. The architects are Messrs. Bruce and Hay, Glasgow.

A petition has been presented to the Bothwell School Board to erect a school at Bothwell Park, a large colliery district midway between Bellshill and Uddingston.

A new school for the Dykehead and Udston districts of Hamilton was opened recently.

BURNLEY.—The site of the new technical school erected in Ormerod Road, Burnley, to be formally opened on September 11, covers an area of about 10,000 yards. The purchase price of the site, which was acquired from Sir J. O. S. Thursby, Bart., was £5,296; and when completed it is estimated that the total cost of the building will be £50,000.

CARR-BRIDGE.—The United Free Church which has just been opened here, has cost £1,600.

DONCASTER.—The Doncaster Race Committee have just had erected an additional stand and enclosure at a cost of £5,960. The plans and specifications were prepared by the Borough Surveyor, Mr. F. O. Kirby, and the contractors were Messrs. Mullins and Richardson, builders, of Doncaster. Mr. W. Booth acted as clerk of the works.

DOVER.—The great marine Continental station, which will involve a sum of £1,000,000, is now being erected. The new station will have special accommodation for mails, and everything required for the comfort of passengers. Work has also been started on a great landing-stage, large enough to accommodate two Atlantic liners at once, and it will probably be ready by next spring.

GLASGOW.—The Dean of Guild Court has given permission to the erection of buildings in connection with the reconstruction of the Glasgow Royal Infirmary. The plans which have been passed pertain to the Castle Street portion, which is estimated to cost about £89,000. When these buildings are erected, about one-half of the new scheme will have been completed. Other linings that have been passed at the Court include the following:—Glasgow and South-Western Railway Company, to erect dwelling-houses and shops in Howard Street and Stockwell Street; Andrew Anderson, builder, to erect four tenements of dwelling-houses in Laverockhall Street and Auchentoshan Terrace, Springburn; the Glasgow Magdalene Institution, Maryhill, to take down buildings in Lochburn Road, and to erect new buildings; J. and J. Fraser, to erect two dwelling-houses on the lands of Burnbank, East; A. and R. Bryson, dairymen, to erect tenements and other buildings at the corner of King Street and Claythorn Street; Archbishop Maguire, and others, for the Roman Catholic Church, Govanhill, to erect a church and clergyman's house in Dixon Avenue and Belleisle Street, Govanhill, at an estimated cost of £15,000.

GORLESTON.—The Primitive Methodist new church upon which work is now proceeding, supersedes an iron structure which has served as a place of worship for over 14 years. Mr. B. G. Beech, of Yarmouth, is the builder.

GRIMSBY.—The new extension which has recently been made to the Welholme School, and which will accommodate an additional 500 children, was opened recently. The extensions occupy what was a vacant space between the boys' and girls' department, and consist of two storeys with four class-rooms on the ground floor, and four on the first floor. Four of these are for girls, with accommodation in each class-room for 50 girls, and four are for boys with an equal accommodation. There are also new additional class-rooms for infants, with school places for 100, a new laundry department, with cloakrooms and latrines. The old buildings have been entirely renovated and brought up-to-date. The architect is Mr. H. C. Scaping, and the builder Mr. H. Marrows. The total cost of the school amounts to over £18,000.

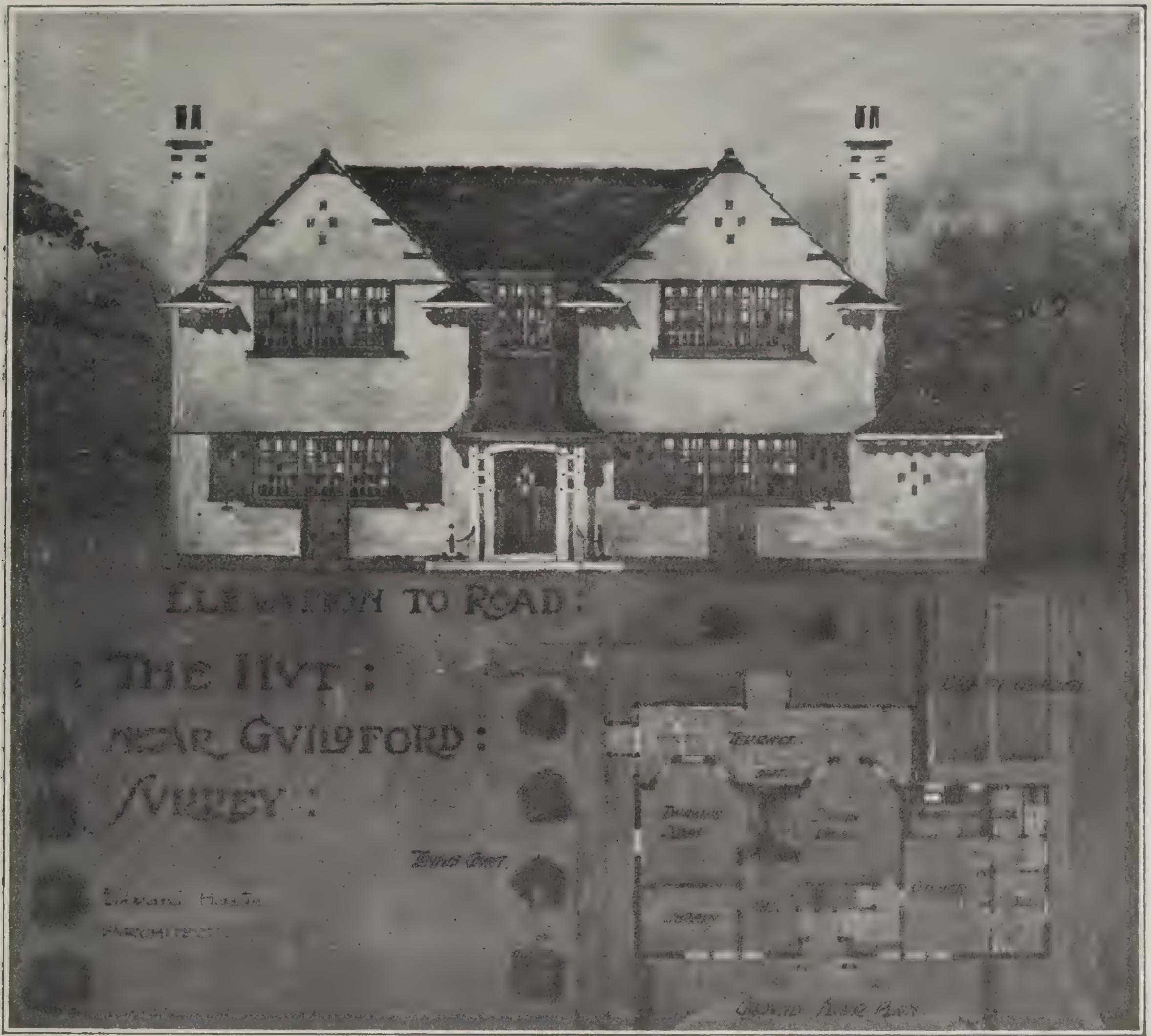
LEES. — The new District Council premises, which have just been opened, and which were the late offices of the Christian Brethren Chapel, have been thoroughly overhauled, and adapted to the requirements of the authorities.

LONDON.—The demolition of Holy Trinity Church, Kingsway, W.C., has been authorised by the Consistory Court. The walls of the church, which was built in 1831, began to crack soon after the construction of Kingsway was begun, and the building has now become unsafe. A new church, seating 800, is to be built, and £7,500 has been raised towards the cost of £8,000.

MANCHESTER.—The Corporation baths, which have just been opened, occupy an area of 3,173 square yards. The males' first-class, with 41 dressing boxes, is 75ft. by 28ft.; the second-class, a little wider and the same in length, with 49 dressing boxes. The baths for females, used as first and second class, is 66ft. by 25ft., and has 49 dressing-boxes. Of the wash baths there are in all 65.

NEWBURY.—The foundation stones of an additional block of municipal buildings which are being erected on part of the site of the old Georgian town hall, demolished a few months ago for the purposes of street improvements, were laid recently.

PETERHEAD.—The extended buildings at the Peterhead Academy, which were opened recently, have been built at a cost of £8,000. Every requirement that the educational needs of the town have rendered imperative, has been catered for. The architect is Mr. Arthur Clyne, F.R.I.B.A., Aberdeen.



"THE HUT," NEAR GUILDFORD, SURREY. EDWARD HASTIE, ARCHITECT.
This house may be regarded as an excellent example of the dignity of simple masses and symmetrical composition.

Mr. Alexander Hay, Peterhead, has acted as clerk of works. The following is a list of the chief contractors:—Mason work, Messrs. Findlay and Henderson, Aberdeen; (the following gentlemen are all of Peterhead): carpenter work, Mr. James Taylor, jun.; plumber and gasfitting work, Mr. John Ferguson; slater work, Mr. James Greig; plaster work, Mr. William Shand; painter and glazier work, Mr. Alexander Ferguson; steel and iron work, Messrs. Milne and Robb; heating installation, Mr. R. Tindall, Aberdeen.

PRESTON.—A plan and estimate referring to the laying out of Haslam Park, having been submitted to the Parks and Baths Committee, it has been recommended that application be made to the Local Government Board for sanction to the borrowing of £6,000, this being the estimated sum necessary for the satisfactory execution of the work.

RETFORD.—The new mission room, the foundation stone of which has just been laid, is, including the land, estimated to cost about £500. Seating accommodation for upwards of 300 people will be provided. The contractor is Mr. Frank Fenton.

SHEFFIELD.—Rapid progress is being made with the new Post Office, work upon which commenced about two years ago. The instrument room is virtually finished, and is about 70ft. broad and 160ft. long, well ventilated, and lit by numerous and spacious windows. Work on the ground floors is not so far advanced, on account of the stonecutting machinery having been placed there, but it is now being pushed forward with great rapidity. It is intended that part of the building shall be ready for occupation at Christmas. This section is at the rear, and comprises an enlargement of the sorting office in Flat Street, which will then afford more than double the present accommodation. The rest of the structure will be opened a year hence.

TOXTETH.—The two important blocks of buildings which have recently been added to the Workhouse, are to serve as mental hospitals for 200 males and 100 females. The complete cost of both buildings, including furnishing fire mains, hydrants, and heating, is about £20,000, or equal to £70 per bed. The architect is Mr. Walter W. Thomas.

WALLSEND.—That portion of the parish scheme which, owing to lack of funds, cannot at present be carried out in its entirety, now in course of erection, comprises the following: The parish hall, an apartment 52ft. long by 31ft. wide, a ladies' parlour, a large class room, and a spacious lobby. The part that has been postponed includes a small hall to accommodate about 100 persons on the ground floor. The contractor for the general work is Mr. John Lant, Tyne Quarry, Walker Road, and for the plumbing work Mr. Thomas Hedderley, of Wallsend. The architects are Messrs. Frank Caws, Steele, and Caws, Sunderland.

WEARHEAD.—The foundation stones of a new Wesleyan Church were laid recently. Mr. Reed, of Fosterley, is the contractor for the building.

WEST BRIDGFORD.—The foundation stone of a new masonic hall has been laid. The main front of the building is to face the river, and a balcony will afford a pleasant view of the reach between Trent Bridge and Wilford Bridge. The main features of the building will be banquetting, lodge, and club rooms. Mr. A. E. Lambert, who is a Brother of the Lodge, is the architect.

PAINT FOR "TOP COATS."

Having dealt with the foundation coat, it is important to determine the chemical and physical properties of each subsequent coating. The difference between the successive coats should be gradual, so as to form a layer which, starting upwards, becomes more elastic as it approaches the finishing coat.

As to the character of the pigment that should be used with the linseed oil varnish for making paint for use as top coats the pigment used must be practically both chemically and physically inert; more important still, it should be in a fine state of division, and form a perfectly homogeneous product which can only be obtained by repeated grinding.

One of the principal functions of the solids in paint is to protect the dried binder from destructive influences. Some substances, by reason of their stable nature, possess this property in a high degree—they do not act chemically upon the oil, and are not easily changed. They are classed as inert pigments, and should be used simply as a means of improving and increasing the durability of the paint.

Regardless of colour, there is no *one* pigment that will "answer all requirements, fill all the offices" of a perfect pigment to mix with the linseed oil varnish for paint making, not a single one that will do what pigments must do, until an ideal binder is found to mix with it, that will retain it and prolong the life of the paint.

Certain solids, under certain conditions and in certain proportions, have mutual action upon each other; they inter-change elements and combine to form new substances.

In Parliament.

By our Gallery Representative.

The Valuation of Sites.

Mr. Ridsdale asked the Prime Minister whether the Government had consulted any professional land surveyors or land agents as to the cost of valuing the whole of the land of the United Kingdom; if so, whether any of the gentlemen consulted had had any particular experience in the valuation of land on the assumption that it was deprived of the improvements attached to it; and, if so, whether he would lay before the House a summary of the information received from those gentlemen, including any records they might have communicated to the Government of actual sales either by private treaty or public auction of site values as defined in Clause 14 of the Finance Bill.

Mr. Hobhouse, who replied, said:—The answer to the first and second parts of the question is in the affirmative. As regards the last part of the question, my right hon. friend does not see his way to accede to my hon. friend's request.

The Piccadilly Hotel.

Mr. Ashley asked the Prime Minister if his attention had been called to the statement with respect to the Piccadilly Hotel (Limited), now in liquidation, that alterations in the designs of the building were insisted on by the representatives of the Crown, as landlord, which entailed an expenditure of about £160,000, and a further large loss owing to the diminished rental of shops sublet in the building; and whether it was proposed to continue this system.

Mr. Hobhouse, who replied, said: I have seen the statement referred to, but there must, I think, be some mistake in it, as I am advised that the Crown requirements, which were in the main settled by the previous Government, could not in themselves have entailed the extra cost or loss in rental alleged. It is clearly desirable that, in the case of large rebuilding schemes on Crown property, due regard should be paid to the architectural result, and I am not prepared to say that a slight additional expense is not sometimes justified for this purpose. At the same time, I can assure the hon. member that care is taken that commercial considerations are not overlooked; indeed, I am at the present moment considering the best method of securing these two objects in another important rebuilding scheme.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns.

Freart's "Parallel of Ancient Architecture."

STAMFORD. PARALLEL.—In reply to this correspondent, Mr. Batsford, bookseller and publisher, 94, High Holborn, W.C., to whom we submitted the question, states that Freart's "Parallel of Ancient Architecture with the Modern" has very little value (only a few shillings).

WIMBLEDON.—T. S. writes: "Please name a building in Rome, with an imposing facade, suitable to measure for the R.I.B.A. Final. It must be easily accessible, and able to be measured quickly. Is there any difficulty about obtaining permission to measure such a building?"

T. S. will be most unwise if he visits Rome without first reading Anderson's "Architecture of the Renaissance in Italy," and a selection at least of the books mentioned therein, which should enable him to judge for himself as to what buildings would be most suitable to his purpose. If his time is short he will be better advised to measure completely a comparatively small building, such as Bramante's Tempietto in the Cloisters of San Pietro in Montorio, rather than to make a hasty drawing of an "imposing facade," such as the Farnese Palace. He should provide himself with the R.I.B.A. travelling card (see current Kalendar), and get it *visé* by the Italian Consul before leaving this country. Architectural students are so usual in Italy, that they are apparently tolerated with a fairly good grace, and difficulties are not as a rule great. G.

Constructing Large Rainwater Tanks.

SLOUGH.—W. R. M. writes: "Please state whether the walls of the rainwater tanks shown in the accompanying sketch (not reproduced) are of sufficient thickness."

The proposed method of constructing rainwater tanks with thin brick walls and cast-iron struts is not at all desirable, as the iron would rust very rapidly in such a position. This is a case where reinforced concrete walls would be very suitable, and application to any of the recognised concrete specialists would enable you to construct an economical and lasting pair of tanks. If the brick walls must be used, then brick arches from pier to pier would be more effective than cast-iron beams. HENRY ADAMS.

The [London] City Engineer, in his annual report, alludes to the various subways for pedestrians provided in the City. The work of constructing subways at Blackfriars Bridge, which would shortly be completed, would cost about £30,000. It would be provided by the London County Council in co-operation with the City's action in widening Blackfriars Bridge. A proposal to construct a subway beneath Bishopsgate Street at its junction with Liverpool Street was considered but not adopted, as the police effectively regulated the traffic at that spot. There were in the City subways of a total length of one mile and 947 yards. The total length of mains and conduits in subways was 13 miles 999 yards. This return does not include certain subways under the control of the London County Council or the Central London Railway Company's subways at the Mansion House, or the subways under private thoroughfares. Various subways have been permitted to be constructed to connect premises occupied by the same persons on either side of streets, and an annual charge is made for each, except when special circumstances prevail.

* * *

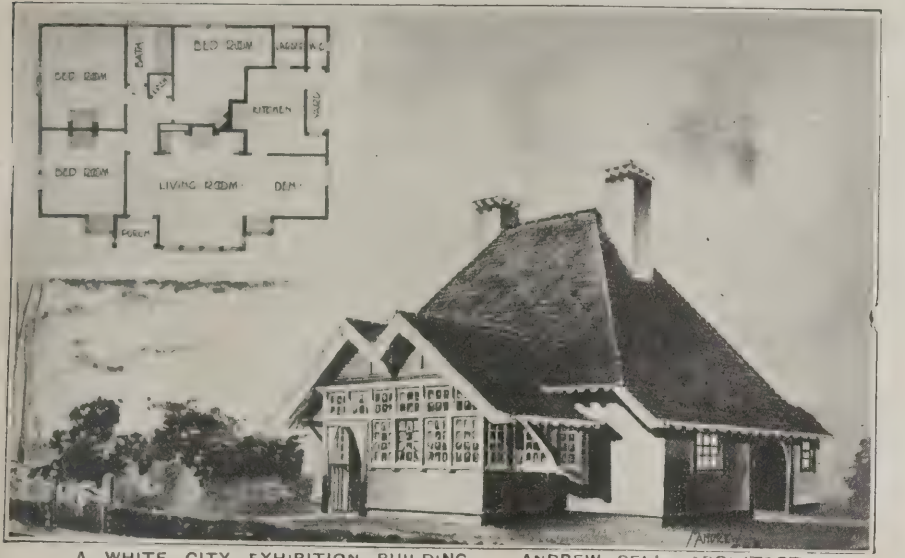
A month ago the members of the Main Drainage Committee of the London County Council paid their annual visit to the outfall works at Barking and Crossness. Since then many members of the Council have expressed a desire to examine the main drainage outfalls, and arrangements are therefore being made by the officials to conduct parties of councillors, during the recess, to the works. The members will be conveyed down the river in the steam yacht Beatrice. Arrangements are also to be made to enable some of the councillors to travel on one of the sludge vessels, in order that they may have an opportunity of seeing the manner in which sewage sludge is finally disposed of.

Federation News.

SHEFFIELD ASSOCIATION.
Secretary: T. Smith.

At the monthly meeting of Sheffield Association, the suggested form of sub-contract submitted by the Yorkshire Federation formed one of the principal subjects of discussion, the points involved being so drastic, and so contrary to local custom, that it was deemed advisable to relegate the further discussion to the Emergency Committee, who subsequently discussed the matter at very considerable length. It was held that it was fair and reasonable that a principal contractor should give notice to a sub-contractor of his intention to apply to the architect for a certificate, though there was a strong opinion held by many members that the sub-contractor had no right to interfere in matters between the principal contractor and the architect, as the sub-contractor had his remedy against the principal contractor, by whom he was solely employed, and as such was not a party to the contract. The further clause giving the sub-contractor the power to terminate forthwith his contract and bring an action against the principal contractor for labour and material to date if the principal contractor omitted within two days of the receipt of a certificate to advise the sub-contractor of the receipt of such certificate was considered to be beyond all precedent, likely to cause litigation and altogether unreasonable, and the committee unanimously decided to refuse absolutely to consider such a clause in any shape or form. The committee also objected to a clause absolutely exempting the sub-contractor from any contingent liability in a case where a claim for compensation to a sub-contractor's workman was based on the alleged negligence of the principal contractor. This matter was considered to be one which affected the respective insurers of the principal and sub-contractor, and any provision of this nature in a contract could only tend to complicate the issue and possibly lead to costly litigation.

The question of the proposed abolition of walking time was again considered on a letter from the operatives, refusing to accept the arrangement that the payment of lodging money or tram or railway fares on jobs over four miles from the parish church should not apply to men "started on the job." This is the main point contended for, seeing that the outside contractor in carrying out work outside the city is able to draw on local labour without paying lodging money or tram fares, whereas the local contractors would be called upon to pay lodging money or tram or railway fares to any Sheffield men who might be set on, whether or not such men had previously been in such contractors' employ. The Association are quite willing to pay lodging money or tram fares to all men sent from contractors' works to a job over four miles from the Sheffield Parish Church, but they consider it most unfair and unreasonable that they should be called upon to conform to conditions which are not enforced or sought to be enforced on the outside contractors. And so the matter now stands at a deadlock, each side having apparently reached the limit of its concession. The meeting unanimously decided that the only course was to give the prescribed notice for abolition of walking time, and this will be given in due course. The matter thus gets beyond the stage of discussion by the Trades Committee and will duly come before a meeting of the Conciliation Board, who, it is to be hoped, will find a satisfactory solution to the difficulty. The Association hold that the prolonged period of bad trade has warranted a reduction of wages, but nevertheless the operatives have not yet been asked to consider such a proposal. The abolition of walking time will put the Sheffield contractor on a level with outside competitors, and of necessity be an advantage to the operatives, who up to the present seem to take the view that it is better to allow an outsider to employ outsiders on terms to which they object, and



A WHITE CITY EXHIBITION BUILDING. ANDREW SELL, ARCHITECT.

The walls are constructed of fibro-cement slabs. The roof is covered with Buttermere green slates in diminishing courses, the chimneys, where emerging from the roof, being rough-casted. The builders are the Alnwick Foundry and Engineering Co., Alnwick and London.

thus lose the local contractor the job, and the local operative the wages. The position the operatives take up is anomalous enough, and is working to the disadvantage of both parties.

The advisability of the adoption of a uniform rate of day-work prices has occupied attention for some considerable time, and the matter was again brought forward on the report of a special committee, who after considering the prices in operation in various parts of the country, unanimously decided to recommend to the Association a uniform rate of 2d. per hour profit on skilled labour and 1½d. on unskilled labour. It was pointed out that the absence of a standard rate had led to a practice of charging only 1½d. on skilled labour, and there were even instances where a still lower rate was reported. The action of one member in sending out a circular advising a reduction of ½d. per hour on day-work prices was very strongly deprecated. After a lengthy discussion, the secretary was instructed to send out a circular to each member in order to ascertain what rate he was charging, and if he were agreeable to fix a minimum of 2d. and 1½d. profit respectively.

NORTHERN COUNTIES FEDERATION OF BUILDING TRADE EMPLOYERS.

Secretary: W. H. Hope, Solicitor.

At a meeting of the Executive Council of the Northern Counties Federation held at Sunderland on Tuesday, August 24th, Mr. J. Davison (Stockton-on-Tees) presided, and there were twelve members present.

Arising out of the minutes, reports were received upon the Darlington Association and affiliation, Auckland Union Building alterations and additions, Hexham District Council and conditions of contract, and dangers attendant upon the use of lead in the painting trade.

The question of the invitation of the National Federation to hold their summer meeting in 1911 within the Northern Counties was considered, when it was unanimously resolved to recommend to the next meeting of the Federation: "That a small Committee be appointed to go into the matter for the purpose of submitting a scheme of arrangements for entertaining the National Federation, and that the Committee consist of the presidents of the Associations on Tyneside, with power to add."

A communication received from the Teesside Association with respect to uniform working hours in that district was considered. At present the various trades work different hours, and are agreeable to fall in with the Teesside employers' suggestion that they should have uniform hours, which alteration would involve a reduction of the total hours worked, providing the labourers do not suffer any reduction in their present weekly wage, so that the readjustment therefore practically means an advance of ¼d. per hour, from 6¼d. to 6½d. This advance would only affect the Stockton and Middlesbrough Associations, the Hartlepool rate being 6½d. The matter was carefully discussed, and it was asked if the desired alteration would not be brought about by notice in a formal way, and appeal to the Conciliation Board. The Teesside secretary (Mr. Creasor) explained the position, and intimated that the feeling on Teesside was unanimously in favour of securing the rearrangement in an amicable, if informal, way. After considerable discussion, Mr. R. Johnson moved that the Teesside Association's proposals to secure uniformity of working hours be approved, all objections being withdrawn.

The financial statement was considered, and attention was drawn to the subscriptions owing from the local associations, the hope being expressed that these associations would remit without delay.

On the proposition of Mr. J. Proud, seconded by Mr. J. Pelton, accounts amounting to £10 8s. 10d. were passed for payment.

It was decided that the quarterly meeting of the Federation at Stockton be held about the third Wednesday in September.—W. H. HOPE, Post Office Chambers, 14, Norfolk Street, Sunderland.

SUNDERLAND AND DISTRICT ASSOCIATION.

Secretary: W. H. Hope, Solicitor.

A meeting of the Executive Council was held in the Board Room on Tuesday, August 17th, Mr. R. J. Huntley presiding.

A letter received from the Amalgamated Societies of Wood-cutting Machinists asking for admittance and representation, was read. After discussion, on the proposition of the president, seconded by Mr. James Taylor, it was resolved: "That the secretary reply to the communication, asking what they desire admittance to and representation upon; further, that the timber merchants be written asking if they have any agreement for working rules with the wood-cutting machinists, and after the necessary information is received, the matter will be further considered by this association."

With respect to the winter working rules, a communication was read from the joiners' society saying they are willing to give the employers' proposals a trial, which was accepted by the employers.

The secretary reported that they had to meet the bricklayers at the close of the meeting to discuss the question of the winter working rules, and it was probable that they would be also willing to accept the employers' proposals.

The amended notice had also been forwarded to the stonemasons, asking them to adopt them, so as to bring all working time into line.

At the subsequent joint meeting of the Association and the Operative Bricklayers' Society, Mr. R. J. Huntley presided.

The employers' secretary explained that the joint meeting had been called to discuss the amended proposals of the employers for the alteration of the winter working hours which were submitted to the operatives on June 22nd, 1909, and read as follows:—"From November 8th to November 27th (both days inclusive), all workmen shall commence work at 7 a.m. and cease work at 4.30 p.m., with twenty minutes for breakfast and forty minutes for dinner, except on Saturdays, when work shall cease at 12 noon, with half an hour for breakfast, making a total of 47 hours per week. From November 28th until January 24th (both inclusive), all workmen shall commence work at 7.30 a.m., and cease work at 4.30 p.m., with 20 minutes for breakfast and 40 minutes for dinner, except on Saturdays, when work shall cease at 12 noon, with half an hour for breakfast, making a total of 44 hours per week. From January 25th until February 20th (both inclusive), all workmen shall commence work at 7.30 a.m. and cease work at 5 p.m., with 20 minutes for breakfast and 40 minutes for dinner, except on Saturdays, when work shall cease at 12 noon, with half an hour for breakfast, making a total of 46½ hours per week."

The operatives said they were willing to accept the amended proposals providing the employers were willing to accept their proposal with respect to paragraph 2 of rule 5 as follows:— "A lock-up shed with fire shall be provided for the sole use of the workmen in which they can have their meals and store their tools when not in use."

The employers pointed out that they could not agree to this proposal, as, if strictly adhered to, it would entail unnecessary expense in carrying out work; and unless it is to be enforced strictly, the present form is as good as one can reasonably expect it to be; but the employers would do all in their power to see that the rule is carried out. After considerable discussion upon the matter, on the understanding that the employers would do all in their power to observe the rule, the operatives agreed to withdraw their suggestion, and agreed to the employers' proposals for the alteration to the winter working rules.

Mr. Irwin, bricklayers' secretary, said that he was of opinion that the word "sufficient" should be placed before the word accommodation in line 2 of paragraph 2 of rule 5, making the rule read as follows: "A lock-up shed shall be provided for the sufficient accommodation of the workmen's tools, and where they can have their meals," and moved its adoption, which was seconded by Mr. James Taylor, and agreed to unanimously.

With respect to rule 12, the proposal of the operatives that the present reading should be deleted and the following substituted was accepted by the employers: "These rules shall be binding on employers and employed alike, and shall only be altered after the expiry of six months' notice given between September 1st and February 28th, either party receiving notice shall be at liberty to counter notice within 14 days of the receipt of the notice."

The employers' secretary reported upon the operatives complaint against a non-local builder for violation of the working rules which had been forwarded to the secretary of the National Federation, who had made a review of the case, which was read and received.

The Sunderland and District Building Trades Association held their Annual picnic on August 19th, when 35 gentlemen, including the members, their guests, and the secretary, had an enjoyable outing. The party left Sunderland for Barnard Castle by the 9.13 a.m. train, and on arrival they were met by a motor char-a-banc, which conveyed them through Ronaldkirk, Middleton-in-Teesdale, stopping at Langdon Beck Hotel for luncheon, thence to Alston, and Hexham for dinner, after which they entrained for Sunderland, arriving at 10.16 p.m. The weather was fine, and the outing a complete success.

Notes and News.

We are informed that Messrs. William Hodge and Co., Edinburgh and Glasgow, have in the press and will shortly publish a work entitled "Construction, Equipment, and Management of a General Hospital," by Donald J. Mackintosh, M.B., M.V.O., Medical Superintendent of the Western Infirmary, Glasgow.

* * *

In pursuance of a scheme inaugurated some years ago with the object of preserving ancient royal buildings against the ravages of wind and weather, repairs are at present being carried out on certain parts of Linlithgow Palace. One apartment to which attention is being directed is the room in which Mary Queen of Scots was born.

* * *

One of the Local Government Board inspectors (Mr. H. Shelford Bidwell) has held an inquiry at Eastbourne in reference to the application of the Town Council for a loan of £15,000 for surface water drainage purposes, and £1,100 for four groynes at Langney Point. There was no opposition, and the action of the Town Council in arranging to do as much work as possible in winter time for the sake of the unemployed is greatly approved.

* * *

Before the Housing and Town Planning Bill reached the Committee stage, Mr. Henry Aldridge, secretary of the National Housing Reform Council, had written to urge the preservation of Clause 30, which, he says, "is regarded by housing reformers as in some respects the most valuable clause of the Bill, providing as it does for the making of a survey of all workmen's dwellings let below a certain rental and the keeping of a register recording the sanitary condition of each dwelling, the state of repair, sanitary equipment, including light, air, space, and ventilation, number of rooms (including bedrooms), water supply, rent, and name and address of owner, etc." It is probable, however, that the clause will be regarded as sanctioning too close an approximation to the invasion of private rights and domestic privacy.

* * *

Following the reduction of the price of gas in Paris to 20c. per cubic mètre (4s. 6d. per 1,000 cubic feet) the consumption has rapidly increased, and the New Paris Gas Company, founded in 1907, has been compelled to undertake extensive additional works, now in course of construction. The sum allocated for this purpose amounts to £1,880,000 and the area of the former works has been increased fourfold. At the present time a new retort house has been completed which is capable of furnishing 6,181,000 cubic feet of gas in 24 hours. Two new retort houses of the same capacity are under construction, and in 1910 the company will be in a position to produce 18,543,000 cubic feet daily in addition to the former output. There will then be four retort houses placed in a straight line. The old plan of working is still maintained; in each house there are six batteries of six double benches, with seven retorts n a row, open at both ends, heated by Siemens furnaces.

* * *

The text of the Development and Road Improvements Bill, which was introduced into the House of Commons last Thursday by the Chancellor of the Exchequer, has been issued. Its full title is "A Bill to promote the Economic Development of the United Kingdom and the Improvement of Roads therein." It is divided into three parts, headed respectively, "Development," "Road Improvement," and "General," and it includes a schedule providing for the compulsory acquisition of land by the Road Board or by a Highway Authority. As the text of the Bill can be obtained from Messrs. Eyre and Spottiswoode for a penny, there is no need to reproduce it here. From the building point of view the gist of it is that, if it passes, a very large sum of money can be voted for the repair and widening of the roads of the country, and this course would naturally involve a large amount of demolition and rebuilding, while the term "development" at once charms and alarms by its immense vagueness and nebulosity.

* * *

More than 16,000 masons, or about three-fourths of the total number employed in Paris, struck work on August 26th. The question at issue is the objection of the men to the system of middle-men contractors, or *tacherons*, who contract to furnish the men required for any job. The masons demand the right of treating directly with the masters. The masters are willing to suppress the *tacheron* on condition that the men accept the principle that, to a given wage must correspond a fixed amount of work, as recognised by the workmen's syndicates in all countries where labour contracts are in force. A later communication states that it is difficult to estimate the exact number of the men on strike. The most authoritative information up to date fixes the figures at about 12,000. An immense mass meeting of the strikers was held on August 27th at the Tivoli Vauxhall, in order to discuss the situation. All the speakers protested against the refusal of the masters to do away with piece work. They discussed in detail during this meeting the masters' proposals relative to a method of payment based on a regular labour contract which could be applied throughout the Department of the Seine.

* * *

We regret to record the death of Mr. W. F. Stanley, the founder of the firm of mathematical-instrument makers that bears his name. Mr. Stanley, who died on August 14th, at his residence in South Norwood, had attained to the age of 81. He was born at Buntingford, Herts, where he gained his early mechanical training in the workshops of his father, who was a mechanical engineer. Mr. W. F. Stanley started in business as a worker in metal and ivory in 1854, and in 1856 he invented the first open stereoscope; but it was in the invention and improvement of drawing and surveying instruments that he gained his high reputation; his first patent in this kind—a bolt to hold firmly the needle of a pair of compasses—being taken out in 1860. He was the author of several scientific treatises, and was an enthusiast for technical education and the handicrafts, founding, in furtherance of his ideals, some trade schools at South Norwood, where, also, he was a generous benefactor in other interests.

Trade and Craft.

Boom in Asbestos Slate.

It is evident that intelligent manufacturers can still hold their own in this country, despite foreign competition. The British Uralite Company (1908), Ltd., report that their current output is phenomenal, as instanced by 200,000 tiles having been just shipped to the Argentine against one order, and 70,000ft. to a West Indian port. This is quite independent of home consumption. They have so arranged their plant, which is supplied by a large engineering firm near London, as to produce 1,000 tiles per hour, and this is hardly deemed sufficient for the orders in hand.

A New Anthracite Heating Stove.

The "Alpha" stove, No. 1, which has just been introduced by the Carron Company, of Carron, Stirlingshire, is specially constructed for burning anthracite coal or coke. The fire chamber is brick-lined, and fitted with movable bottom grates operated by outside handles, thus removing all ash or dust into the ashpan at the foot of stove. All joints are airtight, insuring perfect combustion, which is regulated by the ventilator in the ashpan front. The fire-door is fitted with mica front and nickel-plated handle. The stove is supplied in various finishes, as black-leaded, dull Berlin blacked, finished in armour bright, rough, or best, or in majolica enamel of various colours,, and the prices are graded accordingly.

Insurance.

Free £500 Accident Insurance Coupons have this week been sent to the following:

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Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Abertillery (Mon.).—Accepted for extensions and alterations to Abertillery County School. Mr. E. A. Johnson, architect, Abergavenny. Quantities by architect.

J. Morgan, Blaenavon, £3,396 10s.

Andover.—For erection of house at Redenham. Mr. J. Henry Pitt, architect and surveyor, 9, Summerfield Avenue, Kilburn, London:—

Martin Wells, Aldershot	£1,275	0	0
Staines and Co., London	1,195	0	0
Mussellwhite and Sapp, Basingstoke	1,088	0	0
Sturgess, Deal	1,017	15	7
Bell and Co., Deal	965	0	0
Beale and Co., Deal	964	0	0
Grace and Sons, Deal	960	0	0

Bishop's Stortford.—For erection and completion of a new high school for girls at Bishop's Stortford, for the Hertfordshire County Council. Messrs. Talbot, Brown and Fisher, architects, Wellingborough:—

D. W. Barker, Croydon	£7,062	0	0
W. Lawrence and Son, Waltham Cross	6,624	0	0
S. Roberts, Ltd., Plymouth	6,483	8	7
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H. Martin, Ltd., Northampton	6,017	0	0
Goodman and Murkett, Wellingborough	5,964	16	7
Beardsmore and West, Northampton	6,096	0	0
Hacksley Bros., Wellingborough	5,969	12	6
Brown and Son, Ltd., Wellingborough	£5,890	0	0
J. S. Kimberley, Banbury	5,850	0	0
G. Henson and Son, Wellingborough	5,829	7	6
J. Day,* Bishop's Stortford	5,786	0	0

*Provisionally accepted.

Birkenhead (Ches.).—Accepted for alterations and additions to the bakery at the Workhouse, for the Guardians.

P. Rothwell, Birkenhead, £905.

Bray (Ireland).—Accepted for erection of the new Carnegie Library on the Eglinton Road.

Hull and Co., Ringsend, £1,867.

Chopwell.—Accepted for erection of five shops at Chopwell, for Mr. M. F. Rupp. Mr. D. M. Spence, Shotley Bridge, architect and surveyor.

Bowers and Anley, Rowlands Gill, £2,127.

Culworth (Northants.).—For additions to school. Messrs. Law and Harris, architects, 1, Sheep Street, Northampton:—

A. Bird	£1,425	0	0
W. J. Bloxham	1,134	0	0
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G. E. Stanton	925	19	0
E. D. Sharman and Son	923	15	0
E. Green,* Northampton	898	0	0
A. J. Chown	860	0	0

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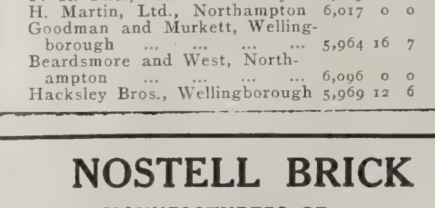

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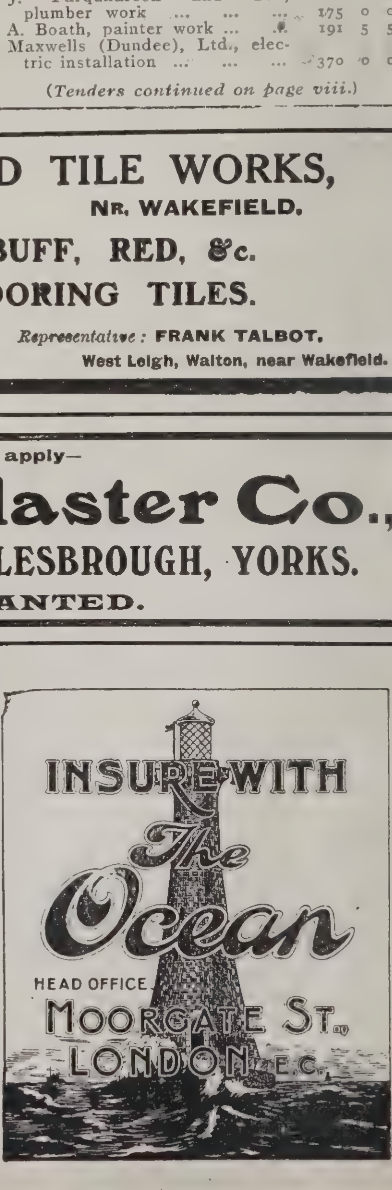

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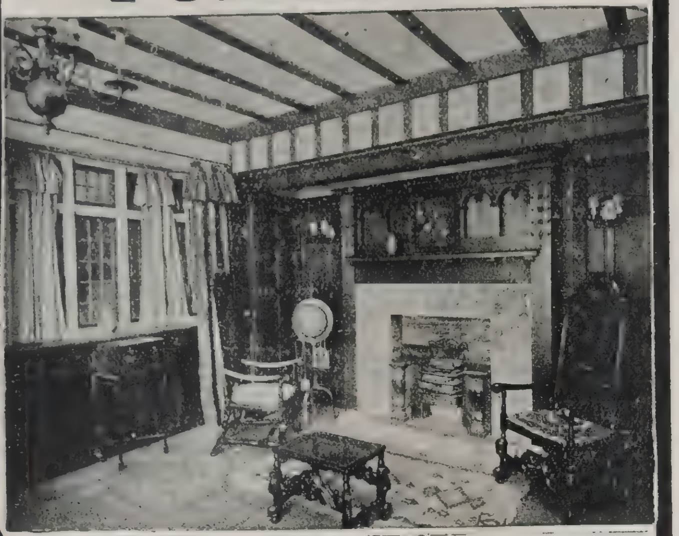

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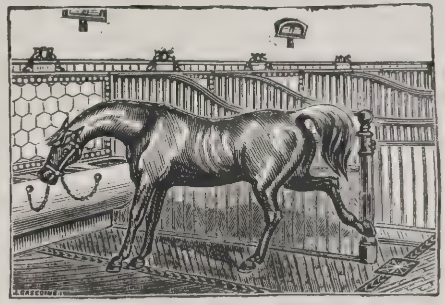

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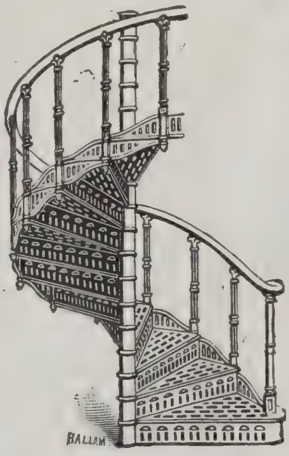

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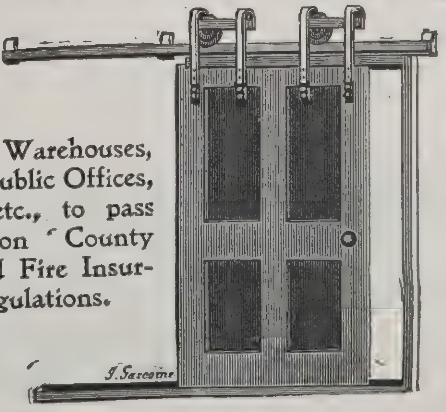

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(Tenders continued from page vi.)

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Original tenders.

T. E. Dives, Lingfield	£612	0	0
J. J. Pink, Merstham	654	0	0
C. Cooper, Warlingham	523	0	0
T. J. Hawkins and Co., Westminster	566	0	0
F. W. Honour, Warlingham ...	530	0	0

Revised tenders.

T. E. Dives	657	10	6
J. J. Pink	611	0	0
C. Cooper	607	0	0
Ginger, Lea and Co., Manchester	598	10	0
T. J. Hawkins and Co.	593	0	0
F. W. Honour	544	10	0

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Smith and Hodson	£1,062	17	0
Emerson Bros.	995	0	0
G. Carter and Son	990	0	0
Marshall and Son	980	15	0
H. and G. Smith	980	8	6
H. W. Parker and Son,* Boston and Grimsby	958	0	0
Edwards and Raynor	912	0	0

Rest of Grimsby.

* Accepted.

Newark.—Accepted for the erection of a new secondary school for girls, for the Governors of the "Lilley and Stone Foundation," Newark. Messrs. Brewill and Bailly, FF.R.I.B.A., architects, Nottingham. Quantities by Messrs. C. Pearson, Shaw, Son, and Hemingway, Ms.Q.S.H., Nottingham, and Bingham, Notts.

Brown and Son, Newark £4,445.

Newcastle-on-Tyne.—Accepted for the work in connection with the erection of the technical buildings at Rutherford College, for the Education Committee.

Middlemiss Bros., Newcastle, £4,659.

Penistone (Yorks.).—For new cattle market, for the Urban District Council. Accepted tenders :—

F. Eyre, Sheffield, excavating, bricklaying, mason and concrete work	£815	0	0
G. Beard and Sons, Thurlstone, stone, slater and plasterer ...	34	15	0
J. Tinker and Sons, Thurlstone, carpenter, joiner, and ironmonger	96	2	4
Atkinson and Sons, Leeds, founder and smith	95	6	10
F. Tinker, Penistone, plumber and glazier	£67	3	7
J. Tinker and Sons, Thurlstone, painting	11	4	1

Perth.—For erection of stone and brick boundary walls for extension to Wellshill Burial Ground, for the Town Council :—

Fraser & Morton, Priory Place	£1,142	2	0
J. K. Paton, Cherrybank ...	1,131	0	0
M. Kerrigan, 58, Atholl Street	1,123	18	0
D. Beveridge, 15, New Row ...	1,121	0	0
E. McKearney,* 20, Scott Street	1,103	3	3

*Accepted

Putford (Devon).—For a mistress's house and other work at the West and East Putford Council school, for Devon County Education Committee. Mr. Percy Morris, architect, 1, Richmond Road, Exeter :—

W. E. Bennett	£791	0	0
Ridge and Shute	750	15	0
Carter and Morris,* Barnstaple	608	10	0

*Accepted.

Sheffield.—Accepted for erection of new buildings and for the adaptation of the existing buildings at "Southbourne," for providing residential accommodation for 60 men students, together with the principal and necessary staff, for the Education Committee.

T. Roper and Son, £11,559.

Towcester (Northants.).—For alterations and additions at the Towcester infants' school. Mr. J. T. Blackwell, architect, 53, High Street, Kettering :—

Sturgess and Sons, Roade ...	£670	0	0
W. W. Webster, Guilsborough ...	540	0	0
T. Heath, Ltd., High Street, Towcester	515	0	0
E. Green, 24, Palmerston Road	510	0	0
G. Haddon and Co., 14 Parade	502	0	6
Holland and Marks, New Street, Daventry	497	15	0
T. Wheeler, Towcester	495	0	0
T. Higgs, Moore Street ...	490	0	0
J. Bentley and Co., Clarendon Park Road, Leicester	477	0	0
Beardsmore and West, Stimpson Avenue	459	0	0
Smith and Bunning, Lancaster Road, Kettering	429	0	0
T. Hickman,* Northampton Road, Market Harborough ...	419	19	0

Rest of Northampton.

* Accepted.

Winchester (Hants.).—For erection of County Council offices, for the Hampshire County Council. Mr. J. W. Taylor, county architect, Winchester. Accepted tenders :—W. Moss and Son, Ltd., Loughborough, £13,436. For the concrete floors : Yorkshire Hennebique Contracting Co., Leeds, £1,000.

Windsor.—For the work in the demolition of the old Theatre Royal, Windsor. Mr. Harry St. J. L. Percival, architect, 47, Mortimer Street, W. :—

N. Wise	£437	10	0
Hollis and Sons	365	0	0
J. Dovey	350	0	0
J. Watson	297	0	0
Dunkley	290	0	0

Whittlesey. — For erection of the Whittlesey Turves School, for the Isle of Ely Education Committee :—

D. Gray, Peterborough	£1,441
Clarke and Son, Whittlesey	1,307
Guttridge and Son, Peterborough ...	1,295
G. Brown, Peterborough	1,292
Duddington, Whittlesey	1,270
Wilkinson and Son, Elm	1,222
Bridgefoot and Son, Peterborough ...	1,220
Rands and Son, Wisbech	1,195
Elworthy and Son,* Wisbech	1,125
G. W. Heath, March	1,117

*Accepted.

Woolfar-Disworthy (Devon).—For enlargement, etc., of West Council School, for the Devon County Education Committee. Mr. Percy Morris, architect, 1, Richmond Road, Exeter :—

W. E. Bennett	£645	18	6
Ridge and Shute, ...	557	0	0
Carter and Morrish,* Barnstaple	436	10	0

*Accepted.

Worcester.—For secondary school for girls, Victoria Institute, Worcester, for the Corporation. Mr. A. G. Parker, architect, Worcester :—

J. Guest and Sons, Stourbridge ...	£6,950
Estcourt and Sons, Gloucester ...	6,936
Stokes Bros., Worcester	6,895
W. Sapcote and Sons, Birmingham	6,875
T. Broad, Ltd., Malvern	6,790
J. Bowen and Sons, Birmingham ...	6,714
Stephens, Bastow and Co., Ltd., Bristol	6,661
J. Wood and Sons, Ltd.,* Worcester	6,437
J. and A. Brazier, Bromsgrove ...	6,400
W. Bowers and Co., Hereford ...	6,384

*Accepted.

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The Crux of Competitions. With reference to our few and casual remarks, in last week's issue, on the perennial and increasingly important subject of competitions, a correspondent expresses surprise that we did not then seize the opportunity to protest against the hardship inflicted on the rule-abiding competitors when an assessor premiates designs whose authors have deliberately disregarded some of the controlling conditions. "For example," writes our correspondent, "the architect who exceeds the stipulated cost by £5,000, or even by a much less sum, assumes a winning advantage, providing the assessor and the client will wink at it, and such audacity on the one hand, and such complacency on the other, are manifestly unfair to those conscientious competitors who scrupulously confine themselves within the limits." Certainly we had by no means overlooked this cardinal point. But it was so self-evident, and had been dealt with so recently in these pages, that it seemed to be in no urgent need of further emphasis. Moreover, it seems to us to be a point of which the importance can be easily exaggerated. Whilst admitting, as we needs must, that competitors should neither be penalised for observing the rules nor rewarded for breaking them, we would nevertheless repeat our plea for some degree of sympathy with the hard case of the embarrassed assessor, on finding himself confronted with conditions that demand interpretation rather than obedience, and really deserve to be either broken or burnt. Conceive his difficulty. He has to decide between conditioned and absolute merit, between designs that are relatively inferior because they are strictly governed by conditions that in some particulars are patently absurd, and other designs that are superior because their authors have temerariously disregarded those particulars. It does not seem so very wonderful that he occasionally—perhaps more often than not—follows the more audacious course, and selects what seems to him to be the best design, independently of literal obedience to details that, architecturally speaking, are better disregarded. That seems to us to be the crux of the matter. As to the morality of such decisions we prefer, for the moment, to say no more than this: that it must not be forgotten that the assessor may possibly feel it to be as much his duty to be faithful to his art and loyal to his employers as it is to insist that all the competitors should toe the line. The mischief arises when the conditions are so faultily drafted as to compel an unnatural antagonism between these interests.

Dolly Statuary. Mr. Clement Shorter, travelling in France, has noted the much greater prevalence of statues in that country as compared with this. Seeing that the French know so much better how to compose statuary, the disparity in numbers is not altogether to be regretted. Seeing that so much, even most, of our outdoor sculpture is so sadly out of harmony with its environment, and that it suffers so severely from the ravages of a soot-and-sulphur laden atmosphere and of a devastating climate, architects are more than ever inclining to the belief that it should be used very sparingly if at all. In particular, they have grown tired of the colossal bronze or stone doll elevated on an inartistic pedestal, and braving, bareheaded as often as not, the vagaries of the English weather. Your monumental group, nobly conceived, and as nobly situated, may perhaps add grace and dignity to a park or square; but the one-man statue (how few are the women commemorated!) should be hospitably entertained indoors out of the wet, and only that by invitation of a responsible architect; who, however, if he have the root of the matter in him, will probably share in our own personal objection to seeing any fine building converted into a sort of dolls'-house. Sculpture should never have been divorced from architecture; and we cannot share Mr. Shorter's regret that the evidences of this upstart independence are fewer in this country than in France.

Patriotism in Art. Our national diffidence in matters of taste is commented upon by Mr. Walter Crane, incidentally or allusively, in a letter which he has addressed to a daily newspaper with the main object of removing certain misconceptions with regard to some work of his and with respect to the aims and influence of the Arts and Crafts Exhibition Society. He finds it necessary to state that he is not "answerable" for the Arab Hall of the late Lord Leighton. The building is planned on the lines of the old Palace of La Ziza, at Palermo. Mr. George Aitcheson was the architect, and Mr. Crane claims only the design of the mosaic frieze. "As to the question of parental responsibility for that *enfant terrible 'l'Art Nouveau,'* " Mr. Crane writes, "when the inner history of the Arts and Crafts movement comes to be written, I think it will be found to be of Scottish and Continental descent. The influence of the Arts and Crafts Exhibition Society as a body may be said to have been entirely counter to it, as one of our main principles is the fitness of design to material." The innuendo in the last sentence is surely a master-stroke of quiet satire. Not less incisive is the observation to which we set out with the express object of quoting. "With regard to the existence of a distinctive English style in decorative art, it is curious that, while the English style is quite frankly recognised on the Continent, where it is eagerly studied and welcomed, it appears to be ignored or to be invisible to the native eye, our people preferring in their turn foreign importations. There does not appear to exist what one might term patriotism in decorative design, except, indeed, in Sweden and in Hungary, where there is national pride in the forms of the traditional peasant arts and handicrafts of those countries, which are carefully fostered and encouraged as of national importance." We should have thought that Italy might have made up a trinity for Mr. Crane's commendation; but, at any rate, it is only too true that English self-effacement in matters of art almost amounts to a disease. It may even be doubted whether the peculiar charms of our English domestic architecture were realised at home until enthusiastic foreigners generously pointed them out.

York Minster Endangered. A line that appeared on the placards of most English newspapers on the first day of the present month filled the lover of architecture with genuine alarm. It was "Fire at York Minster." The foreboding gained intensity from the knowledge that some buildings seem to be specially marked out by some inscrutable fate to suffer from fire, and that apparently York Minster is one of them. Edwin's Minster at York was burnt down, it is supposed, in 741. Albert rebuilt it in 767-780, and his building was destroyed by fire in 1069. The nave, transepts, and probably the choir, were re-edified in 1080, and building of various portions went on intermittently until late in the fifteenth century, when the north-west bell-tower was erected. The choir was injured by fire in 1829, the nave in

1840. It was in the north transept that the fire of August 31st occurred, and as this part of the Minster appears to have been built between 1241 and 1260, it was extremely gratifying to learn that the outbreak was promptly suppressed, the fire hydrants installed in the Minster having been used with excellent effect; otherwise we might have had to mourn an irreparable and a truly lamentable loss. The transepts, each of them four bays long, show a length from north to south of 223ft., with a width of 93ft., the height to the summit of the roof being 99ft., and to the top of the lantern 180ft. "Taken in conjunction with the lantern, they produce an effect to be found in no other Gothic church in the world. In England there are none so wide and so lofty. In France there are interiors even loftier, but in France the transepts are seldom a prominent feature of the design. Often they do not project beyond the outer wall of the aisles of the nave, and oftener still there is no central tower large enough to allow of a lantern at all." In the eastern aisle of the north transept is the very fine tomb, in the fullest beauty of the Decorated style, of Archbishop Greenfield, who died in 1315, the statue of the archbishop being, however, a modern addition. It was behind this tomb that, in 1829, the lunatic Martin hid himself before setting fire to the Minster. In the present instance the fire originated in the lower roof, which was under repair. The roof of the transept is, the more is the pity, covered with zinc, which was substituted for old stone tiles that were found to be too heavy.

Form and Colour. The architect or the decorator who is amative of his art, and who of course keeps a commonplace-book, in which to enter any felicities concerning it, may be glad of this item concerning two views of colour. It is derived from a review, in the "Morning Post," of a new book on Rubens: "The Florentines, using colour to define form, thought of it as a property of form. Florentine colour is an adjective. It is used to qualify a noun, and its own duty and merit consist before all in its qualifying its noun correctly. The Florentines' interest in art was an intellectural interest, and, having at all times something significant and fine to say in their compositions, their tendency, like the Attic tendency, was towards purity of outline and an exact articulation, conditions to which colour was subject. But in Venice the case was utterly different. To the Venetians colour itself was a noun. They thought not of a blue this, a yellow that, and a red the other, but of blue, of yellow, of red. Their compositions presented themselves to their imagination not as a collection of definite shapes of intellectural significance, but as melting depths of colour of emotional significance." The Grammar of Ornament, it would seem, may advantageously borrow its terminology from the grammar of language. But how do you change your point of view so as to regard colour as adjectival or substantival? The answer is that "a great scheme of chiaroscuro is able to make up forms as it pleases, to separate, combine, and unite them in masses, and for purposes of its own. Following this larger distribution, colour finds itself released from its narrow servitude to form, and able to participate in great effects of glowing light or darkening shadow." This seems to be a point that decorators should study with care, as the distinction drawn with such subtlety would, when thoroughly understood, help them to a much clearer view of the functions of colour, and will prove as useful in indicating the limitations as in suggesting the possibilities of their resources. Where the object is not pictorial, the decorator will doubtless be well advised to keep to the Florentine or "adjectival" view of colour; the form being as a rule supplied to him as a concrete entity. He has not to make it, but to colour it. The jotting, at all events, is thought-provoking, even though it should turn out to be of no great practical value.

The Tardy Revival. The business outlook is improving very gradually, and is attended with all the hopes and fears of a slow convalescence; the haunting dread of a relapse still subduing voice and movement. In this matter also a cheerful atmosphere is highly beneficial to the patient, and helps materially towards recovery. Signs of improvement are not lacking. The London bankers report brisker business. The woollen and worsted manufactures show distinct expansion, so that the millowners should soon be in a position at the least to settle their little accounts with architects and builders, even while the improvement is not yet sufficient to warrant any great amount of building extension. The iron and steel industry, both in this country and in America has taken a turn for the better; but this improvement, while heartily welcome as a symptom of reviving trade, is likely to have a directly adverse effect in sending up the prices of materials. This is not altogether a disadvantage. It will have a steadying influence on any tendency to travel too fast or too far in advance of the boom that seems to be coming along; and it will bring prices to the healthy normal level below which they may not sink without creating all sorts of fortuitous and fallacious conditions; as, for instance, when a merchant or manufacturer, grown desperate over his excessive stock, parts with it below cost to a builder or contractor who is by this means enabled to underbid his neighbour, and incidentally to create further depression in the trade. Of course the symptoms of revival are seasonable at any time. It is nevertheless regrettable that the improvement is coming along so slowly that it is not likely to have any very marked effect on this year's building accounts, nor to mitigate to any great extent the gloom of the coming winter; but there seems to be every reason to hope that next spring will see a renewal of that briskness in building of which we have almost forgotten the joyous sensation.

Too Many Houses. A Local Government Board enquiry of rather unusual character has been held at Manchester. It related to the application of the Manchester City Council for release from the obligation to build dwellings to take the place of some that have had to be demolished. The City is unhappily by no means exceptional in having ready to hand housing accommodation enough and to spare. It held a very prominent position in the return of places issued a week or two ago by Mr. John Burns—"returned empties," someone has called them—in which empty houses throw an excessive burden on the community and bring building enterprise to a standstill. Manchester, like most other large towns, is feeling the effects of comparatively recent developments of the transit service. People naturally prefer to get as far away as they can from the smoke and bustle; and this desire is stimulated by the love of novelty. Houses of old type are on this account willingly discarded for what is new in arrangement and in appearance as well as in substance The habit of "flitting," formerly peculiar to the far North of these Islands, seems to be spreading rapidly as the means of gratifying it increase; and the nests that are quitted in the process of flitting, whether or not the flitters be winged and feathered, commonly remain forsaken. In Manchester, as in London, complaint is made that the newness of the suburban houses seems to be their chief attraction, for they have no beauty that men should desire them. In particular, they show the dreary monotony of elevation that has made Suburbia a by-word, and takes the sting out of the chief reproach that has been levelled at Mr. Edison's "poured" houses, which, being all cast from the same mould, would all look exactly alike. Indeed, Mr. Edison seems to be justified of his boast that with half-a-dozen moulds of different patterns he can give more variety of elevation than is usually perceptible in our long lines of deadly monotonous suburban streets; and we are quite without his excuse of cast-iron necessity. A repeat-pattern of essentially pretty elevations, extending through miles of streets, is in the net effect rather more appalling than a town-full of ugly houses that at least show diversity in their hideousness. Uniformity is a foe to picturesqueness, and a foil to town-planning.

THE PARIS MASONS' STRIKE.

At a mass meeting of Paris masons now on strike, which was held at the Tivoli-Vauxhall on September 1st, the delegates of the Masons' Union were empowered to treat directly with the representatives of the Contractors' Union. Some rioting took place outside the building as a result of the efforts of the police, who were assisted by the mounted municipal guard, to obtain possession of a red flag which bore the inscription "Respect for the Law of 1848: Death to the Employers." There was a sharp scuffle, but no one was seriously hurt.

The agreement drawn up by the Paris masons for signature by the employers demanded the abolition of sub-contractors, master-men, and piecework. The men also stipulated for a working day of nine hours all the year round, subject to reduction by mutual consent in times of slackness. Extra time may be worked, however, in cases of urgency, when an increase of twenty-five per cent. on the normal wages will be exacted. Night work is to be charged double. The wages per hour asked are as follows:—Macon, 90c.; garcon macon, 70c; macon limousinant, 85c.; garcon limousinant, 65c.; poseur, 1fr.; pinceur, 90c.; bardeur, 80c.; night watchmen, 4 francs the night. These rates are to apply all the year round, and the men are to be paid on the job; if they are required to make a journey to the office, the employer is to pay for the time occupied in making the journey. Fares are to be charged against employers where jobs are at a distance—as, for instance, outside the fortifications—and the time taken to make the journey is to be credited to the workmen; and, where the mason is compelled to sleep away from his home, the expenses of his lodgings are to be defrayed by the employer, who is to pay on this account a minimum of three francs a day. Payment is also demanded for any loss of time for which the workman is not himself responsible. Lock-up sheds for the safeguarding of clothes and tools are also demanded.

Architects of the Day.-IV.

Mr. George B. Post, of New York.

George Browne Post was born December 15th, 1837, educated as an engineer in the University of the City of New York, and graduated in 1858. It was in that year that the late Richard Morris Hunt first opened his *atelier* for students, and Post entered this school at the same time with the late Charles D. Gambrill, who was first his partner, and afterwards the partner of Henry Hobson Richardson. In the year 1861 the Anti-Slavery War took Mr. Post away from his practice, and kept him for some years in the service of his country. This dissolved the firm of Gambrill and Post. The war over, Mr. Post returned to the practice of architecture, and began to come into prominence as the architect of large and important buildings about the year 1875; and during the years that have elapsed since then, his business has been one of the largest in the United States.

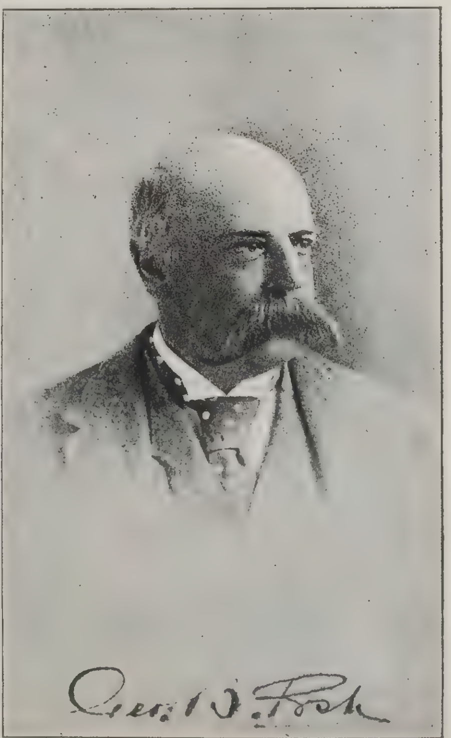
This business is, moreover, distinguished by the importance, from a social and commercial point of view, and by the high cost of many of the buildings, as well as their extremely thorough and workmanlike construction. Many American cities have, among their most important public and mercantile buildings, the structures erected from Post's designs, and several of the most sumptuous and splendid residences in America are also of his work. These buildings are appropriate and enduring, useful and worthy, and, as instanced by his late works, are not without conspicuous artistic merit. Of his earlier work the late Russell Sturgis wrote: "That charm of conventional proportion which, in our modern practice, can only be got by the deliberate sacrifice of convenience and logic to the massing of lines of a facade, is not especially a characteristic of his compositions. On the other hand, these buildings are admitted by all to be among the best built, best planned, most useful and most truly economical of our modern structures. It is, moreover, generally admitted that this architect, more than most men in very large practice, designs his own work. Of course, the mysteries of a working office are impenetrable. No one really knows which member of the firm, or which subordinate of the many in an office of seventy or eighty employees, is really responsible for the merit or demerit of a design. We call a building the design of Smith or Brown, because Smith or Brown is the responsible man; it is he who has received the commission and who draws the percentage; but who deserves the credit or discredit of the plan, the general design, or the details, is absolutely unknown to the outside world. And yet it is not to be doubted that the architect whose work we are now considering does far more of his own original planning and designing—arranges his own studies far more thoroughly and in person—than is at all the rule. It is not many months since Mr. Post said, himself, in the course of discussion at the Architectural League, that the limit of business in his office was that of his own capacity to originate the designs—to make primary studies—and it is probable that no one of those present was inclined to dispute this saying, rash as it seems, and almost incredible, if measured by the well-known practice of many architects in a large way of business."

Since the above paragraph was written Mr. Post has taken into partnership with him his two sons, Mr. William S. Post and Mr. James Otis Post, whose more modern and more thoroughly artistic training has doubtless assisted greatly in the continued improvement which has constantly been observed in Mr. Post's work since the earliest examples began to attract the attention of the American architectural profession.

To use the words "continued improvement" might possibly suggest the idea of "damning by faint praise," and if we were to consider the earliest of Mr. George Post's work as representing in the least his present understanding of architecture, or that his work to-day were merely "improvement" over that of the period of time between the closing of the war and the opening of the Columbian Exposition, the idea might not improperly be suggested. Such, however, is far from being the fact. In few recorded instances has the existence of latent talent been so clearly proved as in Mr. Post, by his works since the days when, through association with a number of brilliant artists, his own artistic instincts were awakened.

One may classify Mr. Post's work into four principal divisions as to time and style: first, his "engineering" period, when he produced the very large, important, and altogether hideous Pulitzer building, Park Row, New York, and one or two others equally unlovely; secondly, his experimental period, when he became more interested in the beautiful side of his work and presented the Produce Exchange Building, at Bowling Green, the old "Times" building in Park Row, the Union Trust Building in Broadway, New York, the first Prudential Building at Newark, N.J., and the building of the Erie County Savings Bank at Buffalo, N.Y.; thirdly, his period of development, when he produced the Cornelius Vanderbilt town house—probably to-day the largest in New York, the Liberal Arts Building at the Columbian Exposition, the Bank of Pittsburgh, and the Park Building at Pittsburgh, Pa., and the Huntington residence in Fifth Avenue, New York; and fourthly, his period of achievement, which may be said to have begun with the strong design which won the competition for the building for the Department of Justice at Washington, D.C., about ten years ago.

Of the earliest of these stages of his work all that should be said in fairness is, that it was much better in construction, and a little better in design, than what was being done by other so-called architects at the time—a time when architecture had almost ceased to exist in all countries boasting "Western civilisation." It was not *architecture* in the sense in which we use the word to-day; it was only good building, which grew simpler, and consequently better as years went on. In the Produce Exchange there is a hall of great dimensions, which is wonderfully effective, due to good proportions and simplicity of scheme. It impresses one immediately as the work of an artist untaught beyond the first rudiments of his art, but not without great native ability. This Produce Exchange Building and all of the vigorous designs mentioned as belonging to his experimental period show the influence of the work of Richardson, but more than this, they reflect truly the life and spirit of the times.


Geo. B. Post

It may be said that the architects of the Columbian Exposition educated themselves at that exposition, since it is a fact that several of those who took part in the work upon that famous design had never done anything else comparable with what they did there. Mr. Post was one of the members of the Board of Architects, and architect of the Palace of the Liberal Arts—from a general point of view, perhaps the finest exposition building that has ever been built, and which was the largest of the Chicago exposition buildings.

For several years following the exposition Mr. Post's work was almost exclusively the commercial class—the gigantic office building being his portion—and with this class of work he kept busy a large number of draughtsmen. But enthusiasm in the artistic side of his profession had been much developed by his experience upon the work at Chicago. Association with such artists as Hunt, McKim, Burnham, Atwood, and Saint Gaudens, had aroused his deep interest in the arts, and especially in monumental architecture, of which his first remarkable study was the successful competitive design for the Department of Justice at Washington—above mentioned. This Department of Justice design is a scholarly study in architecture, at once Classic, modern, and distinctively American.

An entirely different style and feeling is evident in the interesting group of buildings built soon afterwards for the College of the City of New York. This is built on a most admirable site, bounded on the east and north by the curving line of St. Nicholas Terrace, from which the hill goes steeply down to Harlem Flats. To the west and south the ground is level, or even rises a little from the College site, and the entrance front, with its triple gateway, is seen by persons approaching it along what is practically a common city street without much rise or fall. On the other hand, the perspective view with the tower (p. 182) is practically what is seen by the person approaching the building by climbing the steep hillside which will of necessity always be used as a park, the view which is seen by anyone a mile away on what used to be called Harlem Flats. If, in other words, one were to stand on top of a house at 150th Street and Sixth Avenue, the point which we take to be practically coincident with the edge of the Harlem River at that point, he would see the college in this way, or nearly in this way. The Tudor Gothic or "Collegiate Gothic" style of this work suited itself well to Mr. Post's idiosyncrasies as a designer. It appears that the persons charged with the responsibility of selecting a design after what proved to be a very thorough and fair competition, found themselves led to the conviction that this style, associated with memories of Oxford and Cambridge, was what they desired to see used for the new building. A fresher and less "decadent" one would have pleased many of us much better, but it has been interesting to see what this essentially picturesque designer has made of this rather conventional style. The plan is worked out with closest regard to common-sense and the requirements of the situation, and the exterior design has been developed naturally from that well-studied plan.

Since its completion much has been published in regard to this group of fine buildings, and much harsh criticism has been hurled against it, particularly as regards the colour scheme. Due allowance has not been made by the critics for the weathering properties of the materials used, and the ultimate effect when partly covered with vines and relieved by the trees and shrubbery now being added.

The strong character of the design and vigour of its scale are shown by the illustrations of the main hall from the garden side (p. 184), and the detail of the entrance to the Mechanical Arts Building (p. 190).

In his New York Stock Exchange (p. 188), built in 1901, Mr. Post returned to the Classic style, and scored a great architectural success. It is located between Broad Street and New Street, with a side entrance on Wall Street, on a site approximately one hundred and fifty by one hundred and twenty feet. The front to Broad Street, being 140ft., and that to New Street being 153ft., and the entrance on Wall Street 15ft. (page 188). All of the facades, and also the interior, are built of white marble. The Exchange Hall is 86ft. high. The floors above this room are carried on four double girders, 15ft. deep, which span a clear space of 111ft. The twin columns supporting the ends of these girders are 100ft. in height. In design and construction the building was peculiar and original. The requirements demanded that the great hall in the Exchange occupying the principal floor should be as large as possible, and that it should be provided with the maximum amount of diffused light. This result was accomplished by making the colonnades at the ends of the hall on its two street fronts themselves form the end design of the hall, by placing behind them continuous screens of glass. This design is believed to have been entirely original, and it has been extensively copied.

The system of heating and ventilating in the building was also a novelty, and has been entirely successful. The building is heated by direct radiation and ventilated throughout by air of the same temperature, which is forced into the rooms under pressure through carefully placed registers, and removed by a system of exhaust ducts, the position of which has also been carefully selected. From the Exchange Hall the air is removed from the outside walls at a point slightly above the level of the heads of the brokers, and through the tops of trading posts, which are fixed pieces of furniture spaced at regular intervals over the floor. The result has been that during an exceptionally cold snap, when the thermometer fell to 16 degrees below zero, that a variation of but 1½ degrees of temperature could be found in any part of the building. In summer, when the heat is excessive, the incoming air is passed over the coils of a refrigerator apparatus through which zero brine is pumped, and the air is not only cooled, but the moisture which it contains is partially frozen out of it, and the result of this system, which was used for the first time in this building, has been to reduce the temperature by 7 degrees, which was found practically the extent it could be reduced without discomfort to the brokers, and to reduce the humidity, which is far more important than a reduction of temperature 70 degrees.

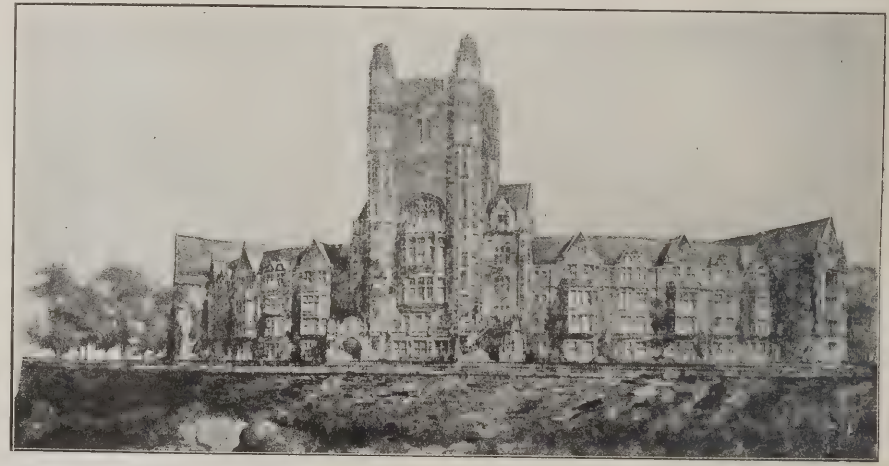
The construction of the building formed a very puzzling engineering problem. The lot was partially occupied by the old Stock Exchange, which contained in its basement a safe deposit vault of very large dimensions, which was filled with millions of dollars of treasure and securities. This vault was constructed on a crust above the quick-sand at a level of about four or five feet below the principal street, and it was essential that the new building should be constructed without disturbing this vault until another could be constructed to which the treasure and securities could be moved. It was evident that in order to provide spaces for the necessary mechanical plant for the building, the cellar would have to be constructed to contain it below the level of the old safe deposit vault, and consequently below the level of the water in the lot. It was evident that if a water proofed cellar were constructed (no matter of what material) sufficiently rigid to retain its form, it would have a flotation. Inasmuch as a great portion of the space above the basement floor was a void, the flotation would be many times the load which could be imposed on the cellar in order to hold it in position. The problem was solved by sinking pneumatic caissons of wood to bed rock touching each other as nearly as possible and in the form of parallelograms. Each caisson was filled with a strong concrete with a semi-circular void several feet in diameter at each end where the caissons nearly touched each other; through this void the caissons were drawn together with bolts, after which the wooden forms between the voids were removed and the joints caulked. A round concrete key was filled into the voids, making a continuous dam around the entire lot to bed rock, extending to a depth of about 50ft. below the curb. Inasmuch as this dam was necessary to the construction of the building, and inasmuch as the ground was extremely valuable, it was decided to excavate the entire lot and utilize the space to a bed rock level. When the entire work was completed the leakage was taken up by a one-inch pipe.

The columns supporting the floors to the level of the great hall were spaced to avoid the old safe deposit vault, and were carried to bed rock through cylindrical pneumatic caissons before any excavations were done. The weight of the old safe deposit vault was transferred to girders between these columns before the remainder of the lot was excavated, and the work was so carefully executed that the old vault was in constant use by the depositors until the new vault was constructed and the securities removed to it.

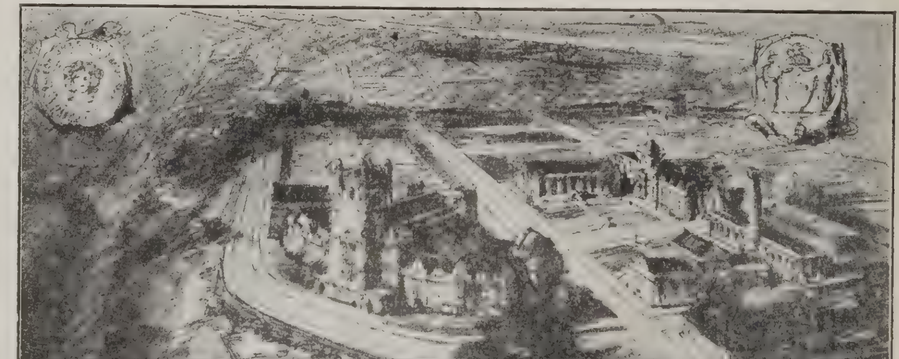
As soon as the dam which formed the foundations of the exterior walls and the interior columns were set, the erection of the building was pushed forward rapidly, and at the same time the excavation of the lot was commenced, which led to the very singular result that the excavation of the lot was not entirely completed until the building was under roof.

The design for the Mutual Benefit Life Insurance Co. Building was selected in competition.

This building, recently erected, is on Broad Street, Newark, and is on a plot of land 191ft. by 99ft. The problem was to design a building indicative of the strength and greatness of an important insurance company. The principle of the design of the New York Stock Exchange, i.e., large free standing columns in front of a glass screen, was followed. The Corinthian order was used, the columns being four storeys high, supported on a base and crowned by an attic. The dead storey behind the main entablature is completely used for filing and storage purposes. The exterior of the building is of white marble, with window screens of copper treated to imitate bronze. The south side of the first floor is occupied by the National Newark Banking Co., and the north side by bankers' offices. The walls of the main corridor are lined with white Vermont marble. The interior of the building is of simple design, appropriate for use as offices, with the exception of the Board Room, which is more ornate and beautifully decorated. The main office of the Cleveland Trust Company is situated on Euclid Avenue and East Ninth Street, Cleveland, Ohio, and has a frontage of 140ft. on Euclid Avenue, and 123ft. on East Ninth Street. The main feature is the Euclid Avenue facade, which has a colonnade of eight fluted columns of the Corinthian order, carrying a pediment with very beautiful sculpture, by Karl Bitter. The building, monumental in character, is built of white granite, and used exclusively for banking purposes. The main entrance



MAIN BUILDING, COLLEGE OF THE CITY OF NEW YORK. GEORGE B. POST, ARCHITECT.
The Tudor Gothic or "Collegiate Gothic" style of this work, which suited itself well to the idiosyncrasies of the designer, commended itself to those who chose it by its associated memories of Oxford and Cambridge.



BIRD'S EYE VIEW, COLLEGE OF THE CITY OF NEW YORK.

leads to a marble lobby, with a staircase arranged at one end and elevators at the other. Directly opposite the entrance are openings to the main banking room, the women's department and the junior officers' quarters, respectively. An entrance also leads into the main banking room from the East Ninth Street facade. The entire first floor is given up to the great rotunda-like banking-room and its dependencies. This room is 61ft. in diameter, and rises to a clear height of 85ft., and has a leaded glass dome. It is finished in marble and bronze, which produces a harmonious and rich effect.

Another fine classical design for a bank is that of the Howard Savings Institution at Newark, N.J. (p. 187).

The design for the group of buildings for the George Washington University—which was planned as part of the great monumental plan of the Capitol City of the United States—was selected in competition in 1905. It is still another fine classical composition of Messrs. Post and Sons (p. 191). The programme was an unusual one, being composed of two parts—one being for the University Buildings, and the other for a Memorial Building to be erected by the George Washington Memorial Association as a memorial to George Washington. Messrs. Post's plan for George Washington University constituted one of the ablest studies which have been made for the details of the city plan of Washington.

Another magnificent piece of city planning—and of a kind too infrequently attempted by architects—is his plan for the suggested improvements of the harbour of Newport, Rhode Island (p. 185).

The capitol building for the State of Wisconsin now in course of construction is a public monument of first importance, and as a work of American architecture will rank the greatest among the many works thus far produced, with which the names of Post will be for ever associated. The site upon which this Capitol is located is one of singular beauty. A square park, situated between two lakes and on the crest of an elevation of land, from the centre of which all of the principal avenues of the city of Madison radiate, both on the direct and diagonal lines, together with the original instructions of the Commission to the competing architects that the building should be cruciform in plan, led to the creation of a design which is radically different from any other existing State Capitol. It possesses singular points of interest both practically and artistically; practically in the fact that the various departments of the government which occupy the building are brought into the closest possible communication with each other, and at the same time are in separate wings of the building, and artistically in the fact that the great central architectural feature of the building, the dome, which rises to the height of about 200ft. above the four wings to the top of the crowning figure representing "Wisconsin," will be approached directly through monumental entrance pavilions constructed on the re-entering angles of the building; and added to this the fact that the whole building to the top of the cupola is of white Vermont granite. On the line of the direct avenues dignified grand staircases lead up to the first floor level of the entrance pavilions. These serve, too, as shelters for the carriage entrances to the ground floor of the building, which may also be entered on the ground floor under the porticos at the end of each wing. The four wings placed on the diagonal lines of the Park on the extension of the four avenues, terminate in dignified porticos composed of six Corinthian columns supporting pediments, in the tympanums of which are groups of statuary by Karl Bitter, that of the west wing representing "The Unveiling of the Resources of the State," and that of the east wing representing "Liberty Supported by Law." The proportion of the building from all directions is enhanced by groups of statuary at the base of the dome overlooking the corner pavilions, which not only add materially to the interest of the design, but to the pyramidal effect of the entire composition. Advantage has been taken of the opportunity afforded to make a thoroughly unique design for the interior, and by the disposition of the grand staircases unobstructed vistas about 200ft. long have been left from the principal rooms in each wing. On the ground floor uninterrupted vistas extend the whole length of the building, more than 400ft. The interior diameter of the dome is approximately 75ft., and its height from the ground floor level to the eye about 200ft. Galleries encircle the rotunda. Those on the second floor level are supported by Waupaca red granite piers, which in turn are supported on the ground floor by Wisconsin green granite piers. The piers which flank the grand staircases are similar, and are erected with each wing. The gallery railings are similar to those of the staircase and stair galleries of each wing. The wall lining of the central portion of the building and the staircase halls of each wing is of beautiful soft-toned Kasota stone. This is up to the main cornice line, above which it will be plaster. The same stone is also used for the wall lining in the main corridors of the first and second floors of the wings, the wall base being of Hauteville marble. On the ground floor corridor stone is used, the skirting and columns being of marble. The staircase rails and the balusters are of dark red Tennessee. The treads and risers are of Meadow Grey Tennessee. The main pilasters of the staircase halls are of Pike River red granite, and the columns flanking the entrance doors to the lobbies of the principal departments at the end of the staircase halls are of red granite. In the interior design Wisconsin stones, or stones from the immediate neighbourhood of the State, have been used wherever practicable, and the architectural effect has been gained rather by elegance of proportion and careful selection of colour than by great elaboration of ornamentation or detail. Where enrichments are used, they are concentrated at the points where they will give the greatest effect, and the best talent has been employed to prepare the necessary sculptural models. In designing the three great rooms of the Capitol—the Assembly Chamber and the rooms of the Supreme Court—the architects have avoided the use, in spite of their architectural beauty, of heavy vaulted ceilings or domical forms, in order to secure as far as possible a good acoustic quality, bearing in mind the fact that the speaker will have to address the audience from any part of each one of the rooms. The form of the Assembly Chamber (A) in the west wing is approximately 73ft. by 68ft. by 41ft. high, lighted through a large circular ceiling light of low-toned leaded glass. The square form of the room is brought into the round form of this opening by very flat elliptical pendentives. The space under the elliptical arch on the north side of the chamber is occupied by the Speaker's platform, behind which the wall is wainscoted to the gallery level. The space above is occupied by the magnificent mural painting by the distinguished artist Edwin Howland Blashfield. It represents "The State of Wisconsin: Its Past, Present, and Future." The space under each of the remaining three elliptical arches is occupied by galleries supported by Breche Violette Italian marble columns, which separate the main auditorium from the entrance lobby and corridors, and in turn give direct access to the loggia on the west front, and the Assembly Parlour on the south side of the wing. The walls of the Assembly Chamber are of the spring of the arches, above which the walls and ceiling are of plaster, decorated with appropriate low tones to harmonize with the marble and Mr. Blashfield's painting. The room is approached through a lobby, the walls of which are lined with Botticino Italian marble, with matched panels in the central portion of Light Sienna marble. The whole length of the lobby is brought into correct proportion by the introduction of columns of Royal Tennessee marble. The central portion of the lobby opens into the main stair hall through three rich electro-plated cast-iron grilles. The Assembly Reception Room is finished in Circassian walnut panelling, with mantels at the ends of Sienna marble, and floor of marble tile. The floor tiling for the halls, corridors, and ante-rooms throughout is in carefully studied mosaic of limestones and coloured marbles in large slabs, and the electric light fixtures and ironmongery throughout have been specially designed as part of the architectural enrichment of the building. The east wing contains on the second floor the Supreme Court Room (B), and a suite of offices for the judges, and on the first floor the Executive Chamber and Attorney-General's Department. On the third floor is situated the library, connected by elevators and stairs with the corridor surrounding the Supreme Court Room, communicating with the judge's offices and also by elevator with the Attorney-General's Department on the first floor. A reading room is also provided for the general public, in connection with the library. A room 46ft. by 40ft. is provided in the attic, the rest of the attic being given up to storage purposes. The Supreme Court Room is square in plan, its dimensions being 42ft. by 42ft. by 30ft. high. It is lighted by a large central ceiling light of low-toned leaded glass work, set in a flat coffered ceiling—this to prevent reverberation. The court room itself will be finished in two shades of Botticino Italian marble, the pilasters being of fine Italian Coralline marble with small columns of Sienna behind the judge's platform. Other marbles of decorative colour are to be introduced where they will produce architectural effect. Space is provided for decorating this room with four mural paintings. The Executive Chamber, with its lobby, is most carefully studied to secure the greatest amount of dignity and decorative effect. The design for this room is in the Venetian Renaissance style, and it is arranged to introduce in the wall panels three historic mural paintings representing prominent events in the early history of the State. The building is designed to stand on a terrace or platform, and thus equalise the differences in the level of the park, and give the building a greater appearance of symmetry.

In describing the recent fire at Messrs. McCorquodale's printing works at Euston, it was noted that the spread of the fire was prevented by the intervention of fireproof doors. We are informed that the St. Pancras Ironwork Co. supplied the double iron doors which rendered this efficient service.

* * *

The sewage scheme which involves the purchase of 600 acres of land at Templenewsam is being expedited by the Leeds Corporation. The price to be paid for the land was fixed by arbitration, and it is announced that the award of the arbitrators is for the payment by the corporation of £149,644. It is estimated that the total cost of carrying out the project will be about one million and a quarter sterling.

* * *

A stained glass window in memory of the Rev. Sydney Orpwood Miller, M.A., was recently unveiled and dedicated in St. John's Church, Horninglow. The window, which is placed in the east end of the south aisle, consists of two large lights, which represent standing figures of St. John and St. Paul. Messrs. Wm. Pearce, Ltd., Bridge Street, Birmingham, were the makers. The cost, about £100, was borne by the parishioners.

* * *

Messrs. E. A. Roome and Co., builders and contractors, of 36, Basinghall Street, E.C., and Crown Works, Homerton, N.E., have secured the contract to pull down and rebuild the "Prince Arthur" public house at Lee, for Messrs. Watney, Coombe, Reid and Co., Ltd., under the supervision of Mr. M. T. Saunders, architect and surveyor.

MAIN HALL, COLLEGE OF THE CITY OF NEW YORK. GEORGE B. POST AND SONS, ARCHITECTS.

The strength of the design and the vigour of scale are conspicuous in this view from the garden side.

THE ATHENÆUM CLUB REDECORATED.

The completion of the new scheme of decoration at the Athenæum Club happily coincided with the recent burst of genuine summer, and no building in Pall Mall during that all too brief period was more attuned to a really blue sky and dazzling sunlight than Decimus Burton's club-house. The work, it is interesting to note, has been carried out under the supervision of the Decoration Committee, consisting of Sir Edward J. Poynter, P.R.A., Sir L. Alma-Tadema, R.A., and Mr. Arthur Lucas. This distinguished body has been responsible for the internal decorations of the club for the last 15 or 16 years, special designs having been presented by the President of the Royal Academy and Sir L. Alma-Tadema. The committee have reason to be satisfied with the success achieved in this instance.

The club in its new dress will be a useful lesson of what a little colour can effect where a too-long tolerated tradition has accustomed us to a monotony of unrelieved stonework or to the more deadening results of stucco. You cannot now walk down Pall Mall without noting the striking contrast between the refreshing harmony of the Athenæum and the cement-washed plaster work of the club confronting it, or the gloomy paint of the Travellers' next door.

In the new scheme the portico, in white and broken white, and the windows, stand out against a background of drab tints, the basement, ground, and first floors, being marked by a scale of three ascending tones; the white spaces are further relieved by the olive green railings of the balcony running round the building, with the pleasing little angle tripods which now show to splendid advantage the delicacy of touch of the original designer of the club. So, too, even with such minor matters as the bronze wreaths on the balustrading to the portico, over which the presiding bronze figure of Athena (formerly in white) completes an harmonious whole, which obtains for its final setting a touch of "living green" in the glimpse of garden that is not without its effect on the amenity of Pall Mall.

It is, however, in the reproduction of the Parthenon frieze, so fitting a finish to the club, that the most noteworthy change has been wrought, for we now see the figures in pure white picked out on a background of ochre, and to many of us the effect will be of having seen the figures for the first time. This is a revolutionary piece of decoration, no doubt, considered in regard to London street architecture. But we must remember that so even the Parthenon must have looked decked out in red and blue, difficult though it may be to forget that it was never one solid mass of pure white marble. No! not even the famous frieze. The frieze of the Athenæum does not of course reproduce anything of the actual treatment of the Greek original—our climate, however propitious for a few days, would not run to that—but it is a departure from latter-day conventions that must go back to Athens for its inspiration.

The work has been carried out by the Decoration Committee by direct labour.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himsel. of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable and it must be understood that both question and reply will, as a rule, be published in these columns

Buying Timber.

LONDON, N.—BOAZ writes: "(1) Is there a book published giving brands, ports of shipment, etc., and means of identifying quality, etc., from brand marks? (2) At what cost, and where, can I purchase a good map of the Baltic Sea, showing ports? (3) What is the routine in clearing timber from docks, and what are the detailed dock charges, rents, landing dues, etc.?"

—(1) A book of the description referred to is being prepared at 84, Leadenhall Street, and will be published about October. (2) It will contain the map enquired for. (3) The secretary of the Port of London Authority will supply a book giving in detail the landing and piling charges on timber. If asking him for it, name the Surrey Commercial Docks in particular. The book probably costs 6d. or 1s. The charges vary very much, in accordance with the nature and quantity of the stuff, but usually run between 10s. and 13s. per standard, when the various small extras are included. Merchants, in selling timber landed in docks, do so, as a rule, free of all charges to buyer, except the 6d. per delivery which the Dock Co. charge the carman when a load of less than one standard is removed. The merchant, in issuing transfer or delivery warrant, usually specifies thereon that goods are to be sent free to buyer for 14 or 28 days. Rent on softwoods is 1s. per standard per month if piled in the open, or 1s. 6d. if piled under cover. This is quite distinct from the landing and piling charges. J. DAVIES.

Powers as to Sanitary Accommodation.

YORKSHIRE.—B. T. writes: "In some old property, middens and privies have been condemned by the medical officer of health, who states that w.c.'s are to be provided. The owner's offer to provide earth-closets, such as are being allowed in new buildings now being erected in the town, has been rejected, though the by-laws seem to permit earth-closets. The houses have w.c.'s on the first floor, so that the earth-closets are not absolutely necessary. Alternatively, could the owner do away with the middens altogether?"

—If there is any provision on the points raised in any local Act of Parliament relating to Scarborough, that provision will be the determining factor. The general law is, according to the latest case on the matter, that if a local authority thinks that a w.c. is necessary, it may require one to be constructed; and if the owner of the house thinks that the w.c. is unnecessary, he may appeal to the Local Government Board (*Sutcliffe* v. *Sowerby Bridge Urban District Council*, 73, J., P., 385; Pub. Health Act, 1875, S. 36). If, therefore, the Local Government Board can be satisfied that an earth closet would be sufficient, or that there are sufficient w.c.'s in the house, an appeal to them would no doubt be successful. Perhaps even if the local authority were informed that the querist was prepared to do away altogether with the privy, they might withdraw their notice and save the necessity of appealing. But the querist cannot neglect the notice, because the local authority may do the work themselves. BARRISTER.

Dampness of Brick and Flint Wall.

BURY ST. EDMUNDS.—INQUISITOR writes: "In a brick-and-flint-faced building, which probably has no damp-course, a damp fungus forms, both on internal and external walls, at places where there is any woodwork. What is the remedy?"

—The age of the building is not stated—whether just erected, or whether built some few years ago—and the nature of the soil would make some difference. There is, however, not much doubt but that the damp rising in the wall is due to the absence of a damp-proof course, and nothing but the insertion of one will prove entirely effective; but if air-bricks are put in at intervals of 5ft. or so round the base, they will help to keep the walls dry, and prevent dry-rot in the ground floors. It may be that the mortar is partly in fault, as poor mortar is always more apt to convey moisture to the interior of a wall. Damp may be prevented from coming through on exterior face by using one of the soluble silicate solutions. All infected woodwork should be removed, and the remainder washed over with a solution of copper sulphate (bluestone).

HENRY ADAMS.

Fee for Design.

Provinces.—Quis writes: "What would be a fair fee to charge for a plan prepared for a speculating builder; and what would be a fair charge for a tracing for the district council?"

—In referring to a "plan," the querist presumably means a design. If so, there is no apparent reason why the speculating builder should be differentiated from any other client. Two per cent. on the cost would be a fair charge for design and working drawings alone. If, however, an ordinary form of plan has been merely drawn out for the builder's use it is a question of draughtsmanship only, and five guineas would probably meet the case. The copy on linen for the District Council would be worth about one guinea.

G.

Remedy for Leaky Tanks.

Lancashire.—J. R. G. writes: "We have some water tanks which are built in cement concrete and finished inside with cement, which are leaking very badly. We do not want to float them in cement again, if there is any other means of stopping the leakage."

—We cannot suggest any remedy for such leaky tanks except the coating of them inside with a bitumen sheeting, of which there are several makes on the market. The tanks are probably leaky because of cracks in the concrete produced by temperature stresses, and these cracks will continually open, no matter what precautions are taken. Therefore, the only thing is to provide a flexible coating that is independent of the tank, and will not be cracked by the concrete opening.

Buildings to Sketch and Measure in Newbury.

In answer to "E. S." (London, N.W.), Newbury itself contains the "Old Cloth Hall" (restored), and a very interesting building called "The Storehouse," besides several good examples of old brickwork. About a mile to the north is Shaw House (1581), and near by is the ruined Early Perpendicular Gate-house of Donnington Castle. About four miles to the west, at Hampstead Marshall, are the splendid series of gate piers—all that remains of the former mansion. About 10 miles in this direction, near Hungerford, is the noble house Littlecote, Wilts, built by the Darrells in the 16th century. At Aldermaston, eight miles to the east, are the entrance lodges of a 17th century house (since rebuilt). About nine miles to the north-east is Aldworth Church, containing a very fine series of Decorated altar tombs of the de la Beche family. Further afield, though strictly speaking, within cycling distance, are the exceedingly interesting towns of Abingdon (20 miles), with its fine town hall, church. and almshouses; Dorchester (20 miles), with its fine Abbey Church, and the delightful village of Ewelme with its 15th century church and cloistered almshouses. The picturesque villages of Blewbury, East Hagbourne, Steventon, and East Hendred, lying close together at a distance of about 15 miles from Newbury, form delightful sketching grounds. At East Hagbourne, the church, village cross, and several half-timbered bricknogged cottages claim attention; Steventon has two very interesting timber and plaster houses, and at East Hendred is a Perpendicular wayside chapel (disused), and an Elizabethan farmhouse.

G.

Quality of Basswood.

Wimbledon. — Columba writes: "Basswood of best quality (left untouched from the plane) is specified for the joinery of a house now being completed. Is it impossible to get this wood in a uniform shade of light brown colour? because what the contractor is using is very varied in hue—some of it being white, like deal, often with very pronounced greenish streaks in it, some of a greenish-yellow tint, and other light brown. Portions of it, too, have black streaks and marks appearing here and there. (1) Can this rightly be called 'Best quality Basswood?' and (2) is it at all likely (if left unstained or polished) to tone down in time to a uniform colour? Strictly speaking, is Basswood obtained from the American Tulip tree (Liriodendron tulipifera) as well as from the American Lime (Tilia Americana) or only from the latter?"

—Basswood is subject to these variations of colour, even in the highest qualities. Prime in this connection means free from knots and splits, and in the trade the differing shades are not regarded as ground for complaint. It is therefore not suitable for joinery unless covered by paint or other decoration to such an extent as to make the original colours invisible. There is no likelihood of its becoming more uniform. It is obtained from the American Tulip tree.

J. Davies.

Combined Drainage.

London, E.—Anglo writes: "Will you kindly inform me through the columns of your valuable paper whether, in your opinion, the whole, or the portion marked B, in the annexed rough plan [not reproduced] of a combined system of drainage, situated outside the metropolis under an urban district council, is legally a sewer repairable by the parish? The property was built some 56 years ago. There is no plan of any part or parts of this system of drainage at the Town Hall, and the Urban District Council have several times at their own expense cleansed the pipes when they were choked up. If you consider the pipes a sewer, will you kindly mention the decision on which you base your opinion?"

—We are of opinion that the drainage system shown from the point where it receives the sewage of the second house (No. 5) is a sewer, and repairable by the local authority (see Travis v. Uttley (1894) I.Q.B., 233). There are numerous other cases bearing on minor aspects, but to the same effect.

THE HOUSING AND TOWN PLANNING BILL IN PARLIAMENT.

The proceedings in Committee on the Housing and Town Planning Bill having been fully reported in the daily Press, it is only necessary to preserve here a summarised record of the proceedings.

The House went into Committee on Monday, August 30th, Mr. Emmott in the chair.

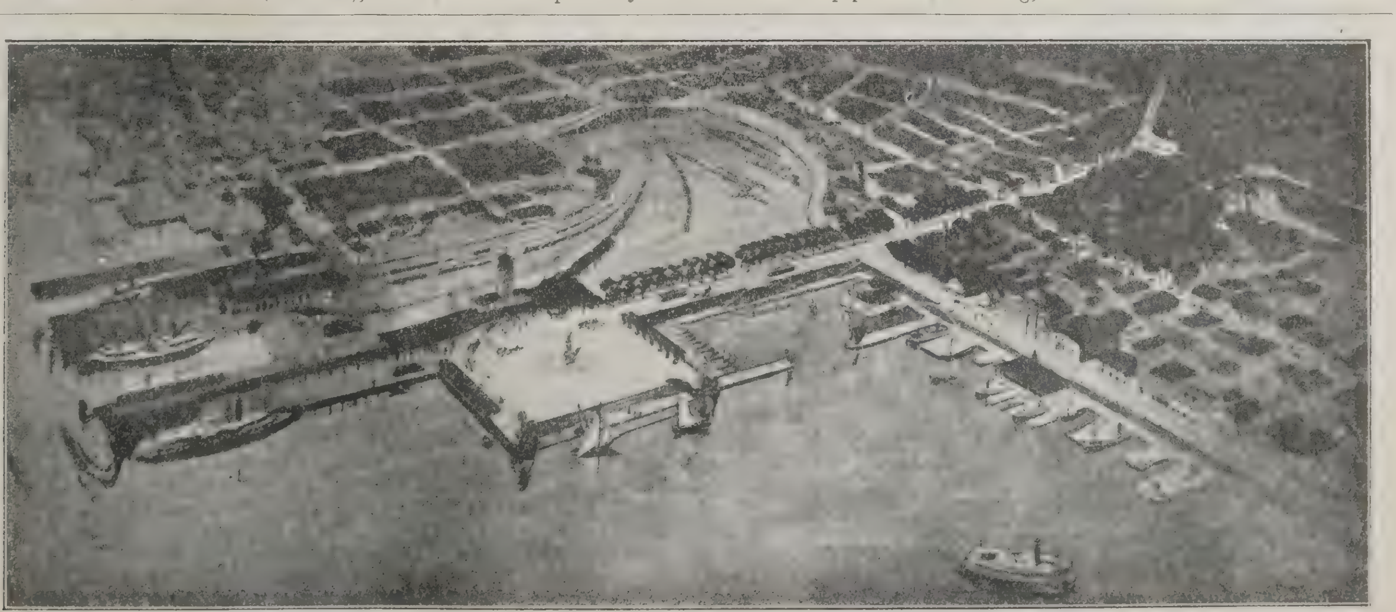
Clause 1 reads: "Part III. of the Housing of the Working Classes Act, 1890 (in this part of this Act referred to as the principal Act) shall, after the commencement of this Act, extend to and take effect in every urban or rural district, or other place for which it has not been adopted, as if it had been so adopted."

Sir F. Banbury moved the omission of the clause, contending that it involved the extinction of the local authorities so far as this part of the work was concerned, and invested the President of the Local Government Board with autocratic authority.

Mr. W. Guinness said that we must depend for better housing on private enterprise controlled and encouraged by the local authorities. Builders at present reckoned on the local authorities not competing; but under this Bill they would put up houses regardless of the heavy loss thrown on the rates, while building in the towns would be checked. It was a dangerous principle to start compulsion where the central authority did not make any grant.

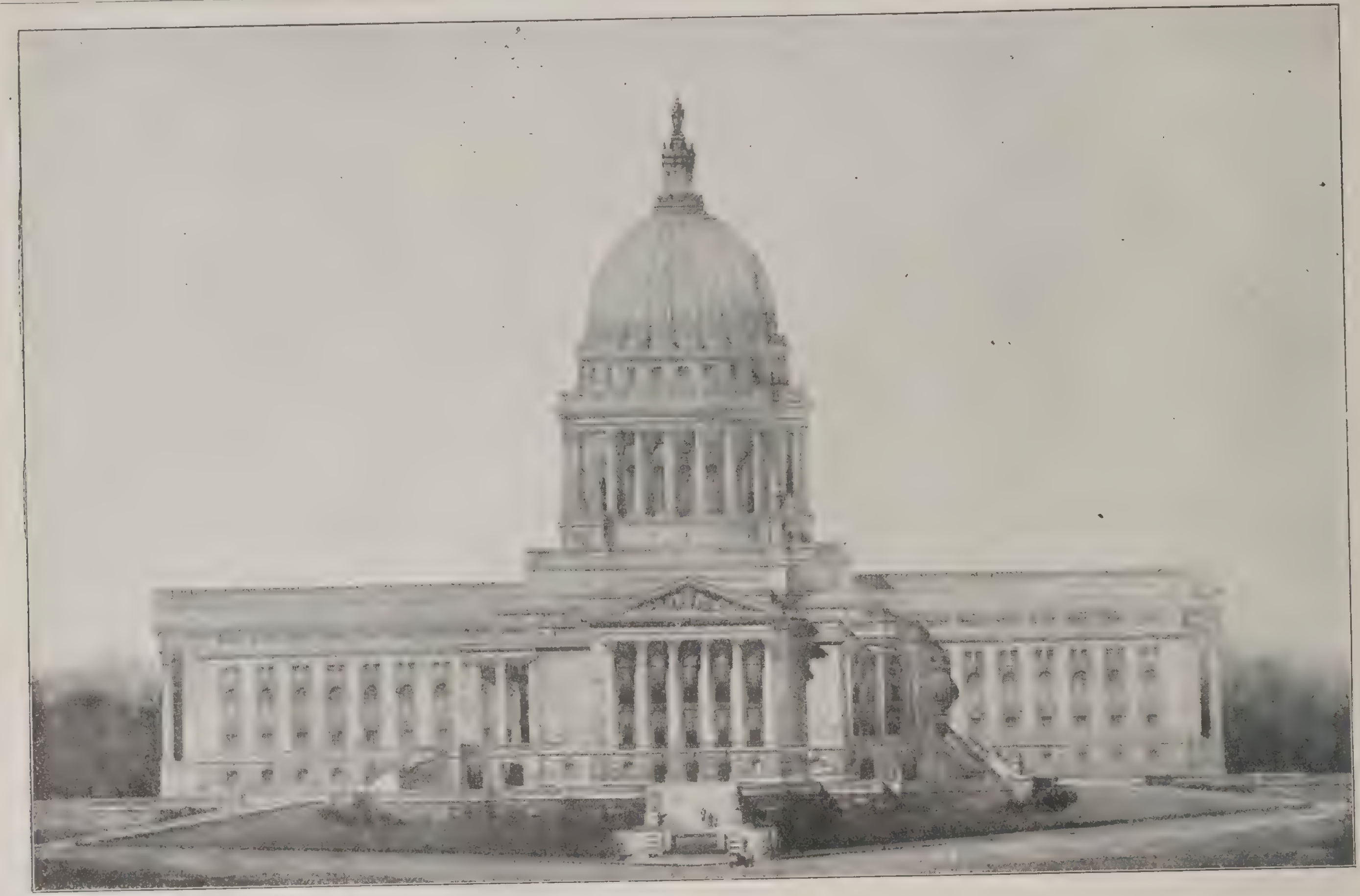
Sir F. Powell, as one who had been long interested in the subject of public health, supported the clause, as he thought the time had come when the House should take another step in advance.

Mr. Burns said that the clause would have exactly the opposite effect to that anticipated by Sir F. Banbury. The object was to enable the 671 rural district councils to cut themselves free from the shackles of the county councils, and, as far as the initiation of housing was concerned, to place themselves under the supervision of the Local Government Board. It would allow these authorities to include in their ordinary sanitary and public health duties the work of housing, which was now denied them. The



SUGGESTED IMPROVEMENTS, NEWPORT HARBOUR, RHODE ISLAND. GEORGE B. POST AND SONS, ARCHITECTS.

This is regarded as a magnificent specimen of city planning of a sort too seldom ventured upon by architects,



WISCONSIN STATE CAPITOL. GEORGE B. POST AND SONS, ARCHITECTS.

This building, which is now in course of construction, is regarded as a public monument of the first importance, and is expected to rank as the greatest work of American architecture yet produced.

conditions in many of the rural districts were such that anything that would stimulate competition between private enterprise and the public authorities in the matter of providing houses would be an advantage. All the clauses did was to give the rural district councils the same powers of grappling with the housing problem as were exercised by the London County Council.

Viscount Morpeth thought the clause futile, as its operation depended on money which the rural councils could not raise..

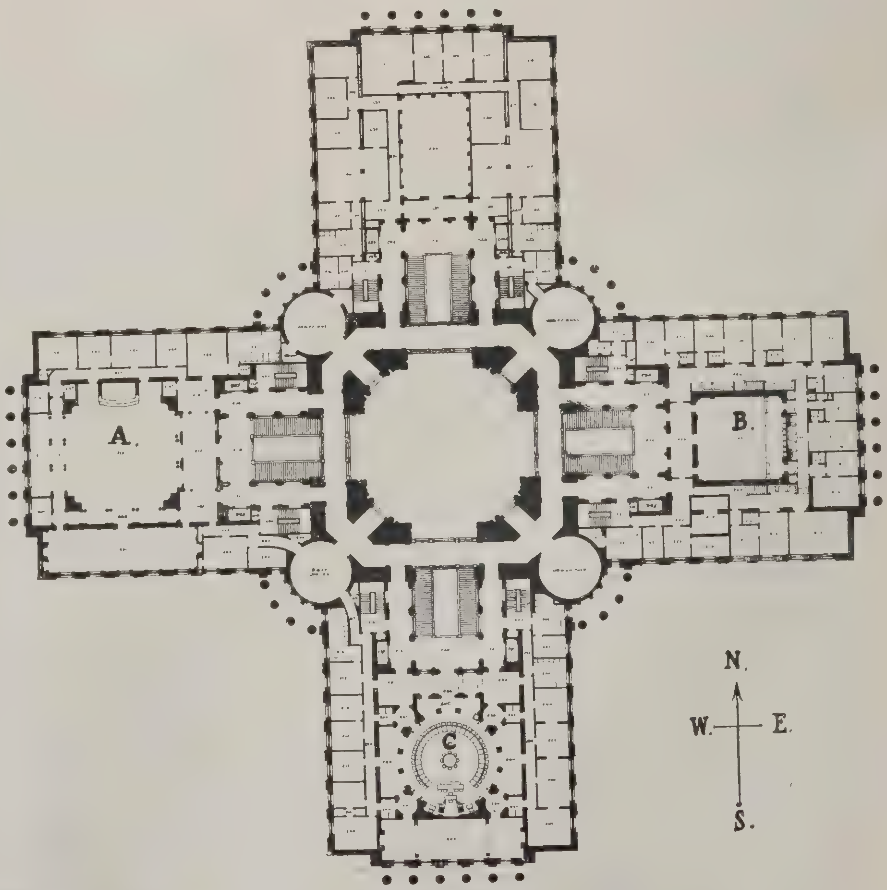
Mr. Lane-Fox did not object to the general principle of the Bill, which he would do his best to help, but he protested against increase of rates imposed against the wishes of the people of a district.

Mr. Munro Ferguson, Sir C. Schwann, and Mr. Adkins supported the clause, and Mr. Carlile opposed it.

On a division, the clause was carried by 132 against 19.

Clause 2 is as follows: (1) A local authority may be authorised to purchase land compulsorily for the purposes of Part III. of the principal Act, by means of an order submitted to the Local Government Board, and confirmed by the Board in accordance with the first schedule to this Act. (2) The procedure under this section for the compulsory purchase of land shall be substituted for the procedure for the same purpose under section 176 of the Public Health Act, 1875, as applied by sub-section (1) of section 57 of the principal Act. (3) A local authority may, with the consent of and subject to any conditions imposed by the Local Government Board, acquire land by agreement for the purposes of Part III. of the principal Act, notwithstanding that the land is not immediately required for those purposes."

Mr. Cave moved to omit sub-section (1). He took exception to the effect that land could be taken by compulsion without the sanction of a provisional order requiring confirmation by Parliament, while, in the ascertainment of the amount of compensation to be paid, no owner of property would



WISCONSIN STATE CAPITOL. PLAN.

The design (the conditions of the competition required it to be cruciform in plan) is radically different from that of any other existing State capitol. The various departments are brought into close intercommunication, and yet are in separate wings of the building. (See page. 183.)

have a right to claim a reference to a jury. He was also strongly opposed to the provisions that any question of disputed compensation should be determined by a single arbitrator appointed by the Local Government Board, and that, unless the L.G.B. agreed, the parties should not be represented before the arbitrator by counsel.

Mr. Munro Ferguson thought that the cost of the introduction of counsel and witnesses would be enormous, and was not in the least necessary.

Mr. Holt thought that there should be independent enquiry before anyone's land was compulsorily taken. The L.G.B. might order compulsory purchase notwithstanding a report unfavourable to that course.

Mr. Lyttelton said that the schedule would enable the L.G.B. to disregard the report of their own arbiter, and sanction compulsory purchase in spite of his report. That was a very strong power, and ought not to be granted. The proceeding the Government laid down was not an arbitration but a valuation.

Mr. W. Guinness, Mr. Morrell, Lord R. Cecil, and Sir F. Banbury having spoken, Mr. Burns said that it was in the interest of the local authority to save money from being spent on legal procedure, so that more money should be available to buy more or better land for more or better cottages.

Mr. Cave pressed the amendment, because he felt that to provide that the Board should nominate the person to fix the price was a gross injustice.

The amendment was lost, the numbers being 146 against 32.

Mr. Brodie moved the insertion of words permitting the local authority to hold land purchased compulsorily, as it would be wise to encourage local authorities to acquire land several years in advance.

Mr. Burns said that the Government could not accept the amendment, as the Bill gave local authorities good and proper opportunities of acquiring land within the purview of reasonably expected requirements. In order to safeguard local authorities from too ambitious enterprises in land speculation, it was advisable to be cautious as to the powers granted them. The L.C.C. had bought 200 acres at Tottenham, of which only a portion was immediately needed for housing. The remainder was being held, with the consent of the Local Government Board. The same thing would happen in the case of land taken by compulsion.

Lord Morpeth, retorting, thought that the holding up of land by authorities would be worse than if it were in the hands of private owners, as the former would escape the increment tax.

The amendment was withdrawn.

Mr. Munro Ferguson moved to omit from the first sub-section the words "Part III. of the principal Act," and to insert "the Housing Acts." The Scottish local authorities thought that the sub-section would make it possible for them to acquire land for sites for lodging houses only.

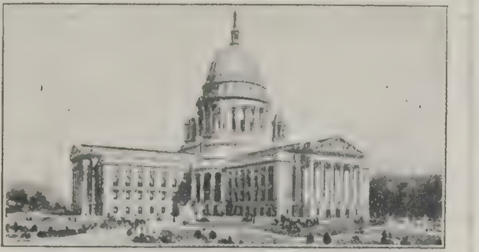
Mr. Burns, in the absence of the Lord Advocate, could not accept the amendment, which was withdrawn.

Sir F. Banbury moved to leave out all the words of sub-section (1) after "principal Act." He objected to private property being dealt with by a sort of Star Chamber.

Mr. Burns objected to the amendment, which was withdrawn.

Mr. Cave moved to add to the sub-section the words, "but this provision shall not apply to any common land within the meaning of the Inclosure Acts, 1845 to 1899, or to any open space used by the public for purposes of recreation," but withdrew his amendment after Mr. Burns had protested that these interests were adequately safeguarded.

Mr. McArthur moved to add the following at the end of sub-section (1): "But this provision shall not apply to any land which, at the date of the order, has been acquired by the owners thereof for the purposes of a railway, dock, canal, water, or other public undertaking." Such bodies had certain powers conferred on them by Acts of Parliament, and he held that it was monstrous that a local authority with the L.G.B. behind it should be able to deprive them of those powers.



WISCONSIN STATE CAPITOL: PERSPECTIVE VIEW.

Mr. Burns said the Government saw no reason why land owned by these companies should be treated differently from the land of other owners. A railway or other company which held land in excess of its requirements, should not be allowed to hold it in perpetuity as against the public needs.

Mr. Lyttelton, Colonel Lockwood, and Mr. Holt supported the amendment, which was opposed by Mr. John Ward, and was lost—33 for, 167 against.

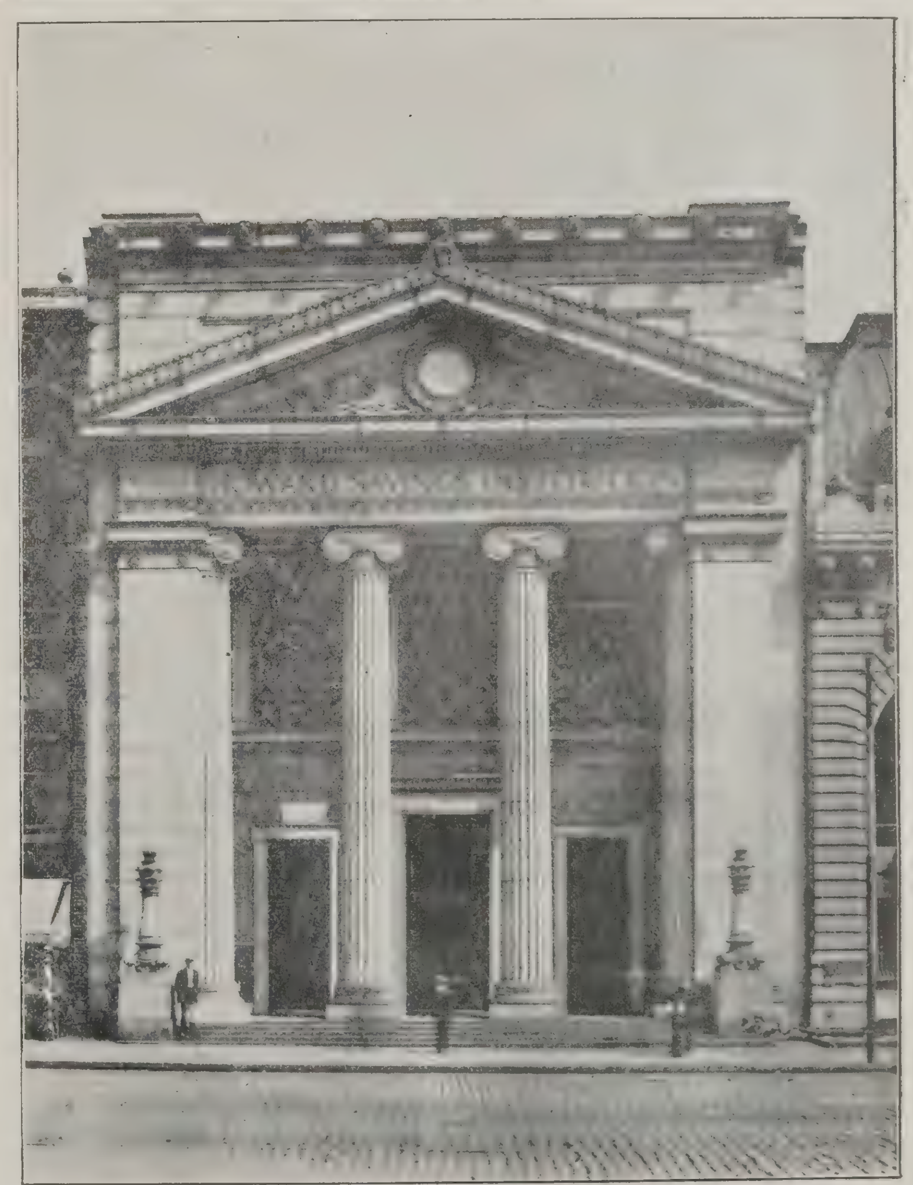
It being now 7.30, the closure was enforced with regard to the other clauses to which private amendments had been set down.

Mr. Burns moved an amendment, which was agreed to, to sub-section (3) of clause 15, which now provides that, on default of the landlord, the local authority may execute repairs and recover the expenses incurred by them from the landlord as a civil debt, or order the expenses to be payable by annual instalments "within a period not exceeding that of the interest of the landlord in the house nor in any case five years."

The remaining clauses, which need not be mentioned in detail, as they possess but little building interest, were carried without much opposition, except clause 30, which deals with quinquennial survey and register. On this Mr. Cave moved to omit the first sub-section, which provides that every local authority shall make an inspection and survey of every house in its district below a certain rateable value, and register the result of such survey, with particulars. He regarded this as a serious blot on the Bill.

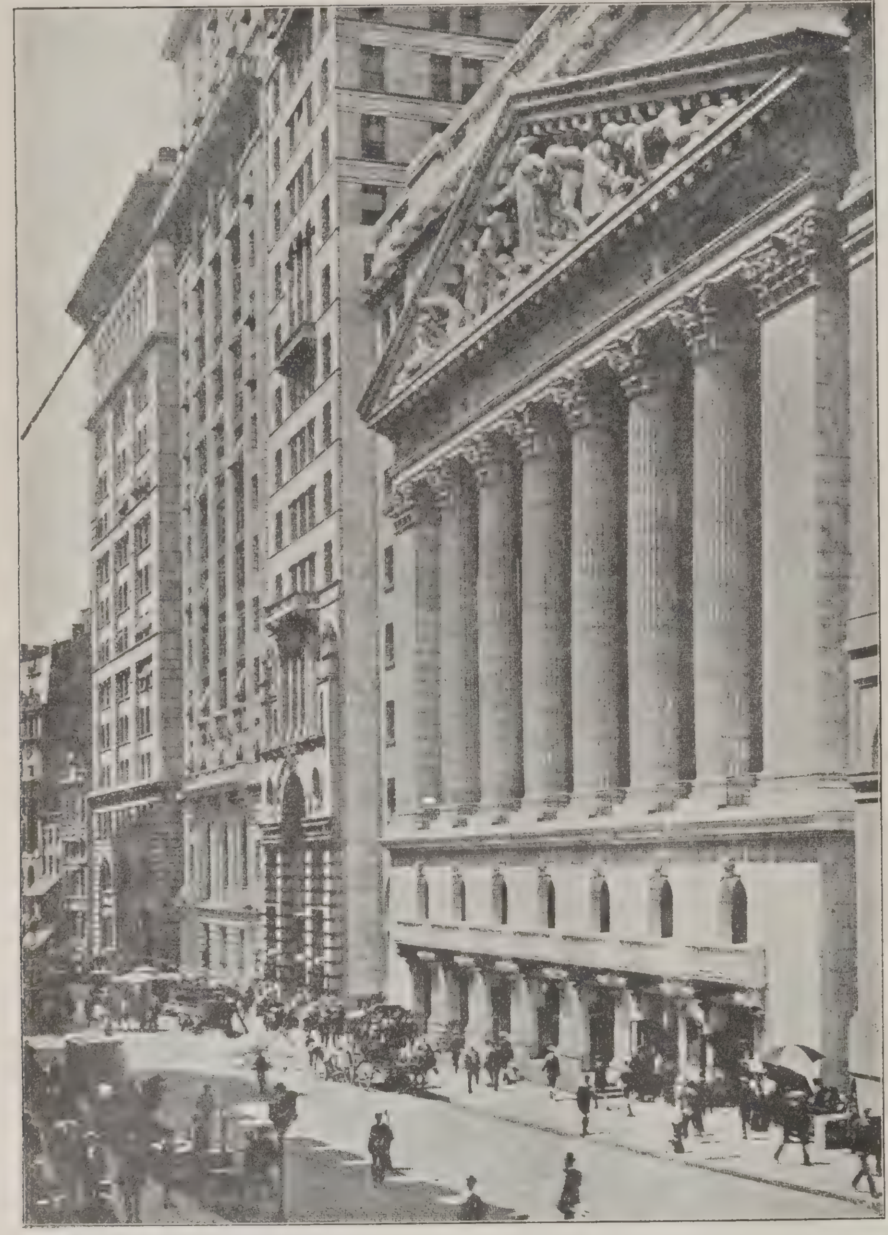
After a somewhat protracted debate, the voting resulted as follows: For the sub-section, 75; against, 121.

On clause 44, prohibition of back-to-back houses, Mr. Burns moved to add at the end of the clause: "Provided that nothing in this section (a) shall prevent the erection or use of a house containing several tenements in which the tenements are placed back to back, if the medical officer of health for the district certifies that the several tenements



THE HOWARD SAVINGS INSTITUTION. NEWARK, NEW JERSEY. GEORGE B. POST AND SONS, ARCHITECTS.

A fine classical design for a bank. (See page 183.)



NEW YORK STOCK EXCHANGE. GEORGE B. POST AND SONS, ARCHITECTS.
In this building all the facade, and also the interior, are of white marble. In design and construction, the building is peculiar and original. (For discription see page 182.)

are so constructed and arranged as to secure effective ventilation of all habitable rooms in every tenement; or (b) shall apply to houses abutting on any streets the plans whereof have been approved by the local authority before May 1st, 1909, in any borough or district in which, at the passing of this Act, any local Act or by-laws are in force permitting the erection of back-to-back houses."

The numbers were: For the amendment, 121; against, 64. On the question that the clause as amended stand part of the Bill, the voting was: For the clause, 115; against, 69.

On Tuesday, August 31st, the House again went into Committee, when Part II., the town-planning part of the Bill, was discussed.

Mr. J. W. Cleland moved to omit the words "the Local Government Board may authorise," at the beginning of sub-section (2), which reads: "The Local Government Board may authorise a local authority within the meaning of this part of this Act, to prepare such a town planning scheme with reference to any land within or in the neighbourhood of their area, if the authority satisfy the Board that there is a *primâ facie* case for making such a scheme, or may authorise a local authority to adopt, with or without any modifications, any such scheme proposed by all or any of the owners, or any land with respect to which the local authority might themselves have been authorised to prepare a scheme." Mr. Cleland said that whereas the local authority must obtain the permission of the L.G.B. before it could prepare a town-planning scheme, a private owner or syndicate was under no such obligation.

Mr. Burns defended the clause, and the amendment was withdrawn.

Sir F. Banbury moved an amendment which stood in the name of Mr. McArthur, excepting from the operation of the clause land acquired by any corporation or company for the purposes of a railway, dock, water, or other undertaking.

The amendment was lost—41 for, 176 against.

Mr. Mitchell-Thomson's proposal to omit "or in the neighbourhood of," in order to prevent friction between lôcal authorities, was withdrawn.

Sir F. Banbury moved the omission from sub-section 3 of the words, "a piece of land already built upon," so as to take it out of the power of a local authority "who fancied that they were endowed with great architectural ability practically to demolish the better part of a town."

The amendment was lost—49 against 196.

Mr. Cave's amendment to sub-section 7, designed to prevent the L.G.B. having power to decide, without appeal, whether or not land was likely to be used for building purposes, was lost—51 against 195.

At this stage the closure was put in force.

Mr. Burns's amendment to clause 57, to omit the words, "Nevertheless, no such compensation shall be paid till such time as the loss has actually occurred"—with reference to compensation to any person whose property is injuriously affected by the operation of a town-planning scheme—was accepted.

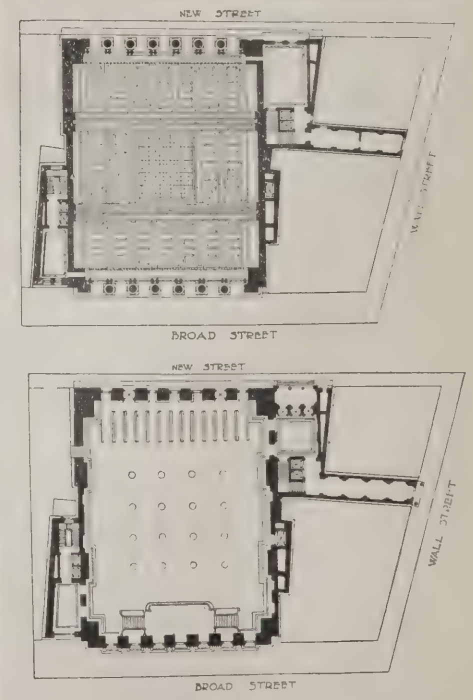
Lord R. Cecil, on behalf of Mr. Cave, moved to omit from sub-section 2 the words "or after such other time as the L.G.B. may fix for the purpose," and to insert, "if in the opinion of the Court such work was done with a view to obtaining or increasing compensation under this Act"—the idea being that a time limitation should not be fixed unless there was some ground for thinking that work had been done with a view to increasing the compensation.

Mr. Burns's chief objection to the amendment seemed to be that it substituted a court of law as the deciding authority, instead of the L.G.B.

The amendment was withdrawn.

With regard to sub-section (3), Mr. W. Guinness moved the substitution of the words: "In determining the amount of compensation under this section, regard shall be had to the extent to which lands and hereditaments belonging to the same proprietor may be benefited by the scheme."

Some remarks in favour of this amendment by Lord R. Cecil brought out from Mr. Burns a terse statement of "what the Government contemplated in a town-planning scheme." "Roughly," he said, "it was this. Whereas in the past, without any scheme, roads had been badly laid, of insufficient width, and without any relationship to other roads, the Government by this Bill gave the responsible local authority power to initiate a town-planning scheme, so that private owners would improve their own properties instead of acting to their individual or collective detriment. In nine cases out of ten the scheme would consist less of proposals to buy land than of assisting private owners to lay out their properties beneficially." In the experience he had had of town planning and housing estates, he had been surprised, speaking generally, at the way in which all the interests concerned had co-operated to make the best of the



NEW YORK STOCK EXCHANGE. PLAN OF BOARDROOM FLOOR.
The peculiar features of this plan are detailed on p. 18

situation, and he was convinced that the practical instinct peculiar to the English people in matters of this kind would so prevail that all questions of conflicting interests would be reduced to a minimum. The amendment was lost—36 against 184.

Mr. Cave moved to amend sub-section 4 by substituting arbitration instead of the authority of the L.G.B. in determining any question as to whether any property is injuriously affected or increased in value.

The Attorney-General opposed the amendment on the ground that the machinery of arbitration would be cumbrous and costly out of all proportion to the value of the issues that would ordinarily be involved.

The discussion, in which Mr. Lyttelton, Mr. Burns, Viscount Morpeth, and Lord R. Cecil took part, lasted until the closure came into operation, when 57 voted for the amendment, and 194 against.

Mr. Burns moved the insertion of the following in clause 58: "(2) Property shall not be deemed to be injuriously affected so as to give rise to any claim for compensation under this part of the Act by reason of the operations of any provisions inserted in a town-planning scheme, which, with a view to securing the amenity of the area included in the scheme or any part thereof, prescribe the space about buildings or limit the number of buildings to be erected, or prescribe the height or character of buildings, and which the Local Government Board, having regard to the nature and situation of the land affected by the provisions, consider reasonable for the purpose."

The voting was—for the amendment, 206; against, 50.

This concluded the clauses as they stood in the Bill. New clauses, on "Saving of Sites of Ancient Monuments, etc.," and "Provisions as to commons and open spaces," were added to the Bill. The clause "Provisions as to land in neighbourhood of royal palaces or parks" was challenged by the Labour Party, whose objection was defeated by 194 against 50.

All the schedules were adopted, only schedules 1 and 4 exciting opposition.

London Suburbs.

Richmond.

There is no place in Greater London which has so plainly a character of its own as Richmond. It is indeed so marked that the name of suburb may, perhaps, jar a little upon the ear of its inhabitants. It has many advantages: a matchless view from its hill, perhaps the most characteristic piece of scenery in England; a river specially fitted for recreation, and two fine parks, one of them on a very large scale. As a residential neighbourhood, it cannot be separated from its neighbour, Twickenham, the contrast between the two being somewhat marked, the latter lying upon flat land by the river. Horace Walpole has immortalised it in his letters; Strawberry Hill, his "little Gothic castle," a curious fancy in an age of "classic" building, still stands, and its river banks are still unspoilt: it has room to spread to the northward into Middlesex. Richmond, however, is somewhat circumscribed by its very picturesqueness; its parks, commons, and river hem it in, and its only possible expansion is towards Sheen; for Kew, which is practically its suburb, is itself prevented from spreading by its beautiful Royal gardens.

Architecturally, Richmond possesses a quaint relic of older times in its Green, bordered by some excellent specimens of early eighteenth century architecture known as Maid of Honour Row, many pleasant villas of "the day before yesterday" period, and the celebrated gateway, and some other remains of its Royal Palace. The gateway is a large and bold Tudor arch of stone in a red-brick wall. It gives entrance to a space formerly called the Wardrobe Court. Passing inside we find the zig-zag designs of black running through the red Tudor walls in marked contrast to the heavy sash windows introduced late in the seventeenth century. The Palace originally extended nearly to the river; it was celebrated for its many turrets and pinnacles and vanes, the latter fashioned into the King's arms, and, as an old writer tells us, "payntid and gilte with riche gold and azure," and when they creaked, "pleasant to see and hear in a wyndy day."

Thus comparatively limited, long associated with royal residences—of which two still survive in the Park—Richmond is at once popular and select. Where modern work is seen it is generally of red brick, and is limited to villas, which are of the type nearly universal in the last twenty years. Many older styles, however, may be found on the slopes of the hill. The town properly so-called is bright with shops, and as usual some of the best buildings are its banks. It is curious that two distinct sets of complaints are heard from residents in this pleasant town; one, that owing to trains, tramways, motors, and modern changes generally, the number of visitors is so great that the place is spoilt; the other, that for a place so near "town" the means of reaching it are quite inadequate. The main attraction of Richmond is undoubtedly its beautiful river, and this, with Ham House on one side, and Hampton Court on the other, is unique. In regard to possible new buildings on the Middlesex shore, it should be said that to preserve its river scenery is essential to the popularity and, consequently, the prosperity of the place. Its newest developments, whilst "attractive residences," have not yet given us that new style which is to meet all modern wants and settle all questions, whether of taste or comfort. But perhaps it may never come.

Proposed New Works.

ABERDEEN.—The addition which is to be made to the Royal Infirmary Buildings is to occupy a site upon which at present stand a block of houses immediately opposite the main Infirmary buildings, and forming the square between Woolmanhill, St. Andrew Street, North St. Andrew Street, and John Street. A commencement has been made with the demolition of the houses preparatory to the erection of the new block, in which will be located the outdoor patient department, the dispensary, a few beds for casualty cases, a theatre, etc. There will also be a reception hall in the block.

BASINGWERK (WALES).—The Chester Society of Natural Science, Literature, and Art, are endeavouring to prevail upon the authorities to preserve the ruined abbey of Basingwerk. The abbey, of which there are still considerable remains, stands on rising ground near Holywell station. It is believed to have been built in the twelfth century, and was then under the patronage of Ranulph Earl of Chester.

BATLEY.—It has been proposed to erect a new temperance hall at an estimated cost of £7,000. There appears to be slight probability of the scheme proceeding at present, however, as the sum of £1,000 as a donation is required before the committee which has the matter under consideration deems itself justified in authorising a commencement.

BATLEY.—The condition of the Parish Church having excited grave misgivings as to its safety, it having been discovered recently that the oak beams supporting the roof of the nave and chancel were in a dangerous condition owing to dry rot, it has been decided that a temporary roof shall be fixed in place of the one that has been removed. A scheme for the erection of an entirely new church has been initiated.

BENTLEY.—A Local Government Board inquiry has been held into an application by the Doncaster Rural District Council for power to borrow an additional £3,000 for sewage disposal work in the parish of Bentley-with-Arksey.

BIRKENHEAD.—The Corporation have at present under consideration a plan which has been prepared by Mr. T. T. Rees, architect, of Liverpool, for the improvement of the foreshore between Rock Ferry and New Ferry. This involves the reclamation of a large piece of the foreshore, the construction of a semi-circular road between the two points mentioned, and some minor alterations and additions.

BRIGHTON.—The Town Council have under consideration a proposal for the provision of a winter garden at the Brighton Aquarium. It is suggested that a large hall be erected on the site of the present terrace.

COATBRIDGE.—There are signs of improvement in the building trade which has been at a very low ebb for some years. At the local Dean of Guild Court, Messrs. Stewart and Lloyds, tube manufacturers, have presented plans for the erection of large stores at their British Tube Works; Messrs. Loudon and Inglis, builders, have obtained permission to erect additional workshop and offices at their factory in Calder Street; the Coatbridge Co-operative Society were granted a lining to erect a range of stables in Jackson Street. Two petitions to convert buildings into skating rinks have also been presented.

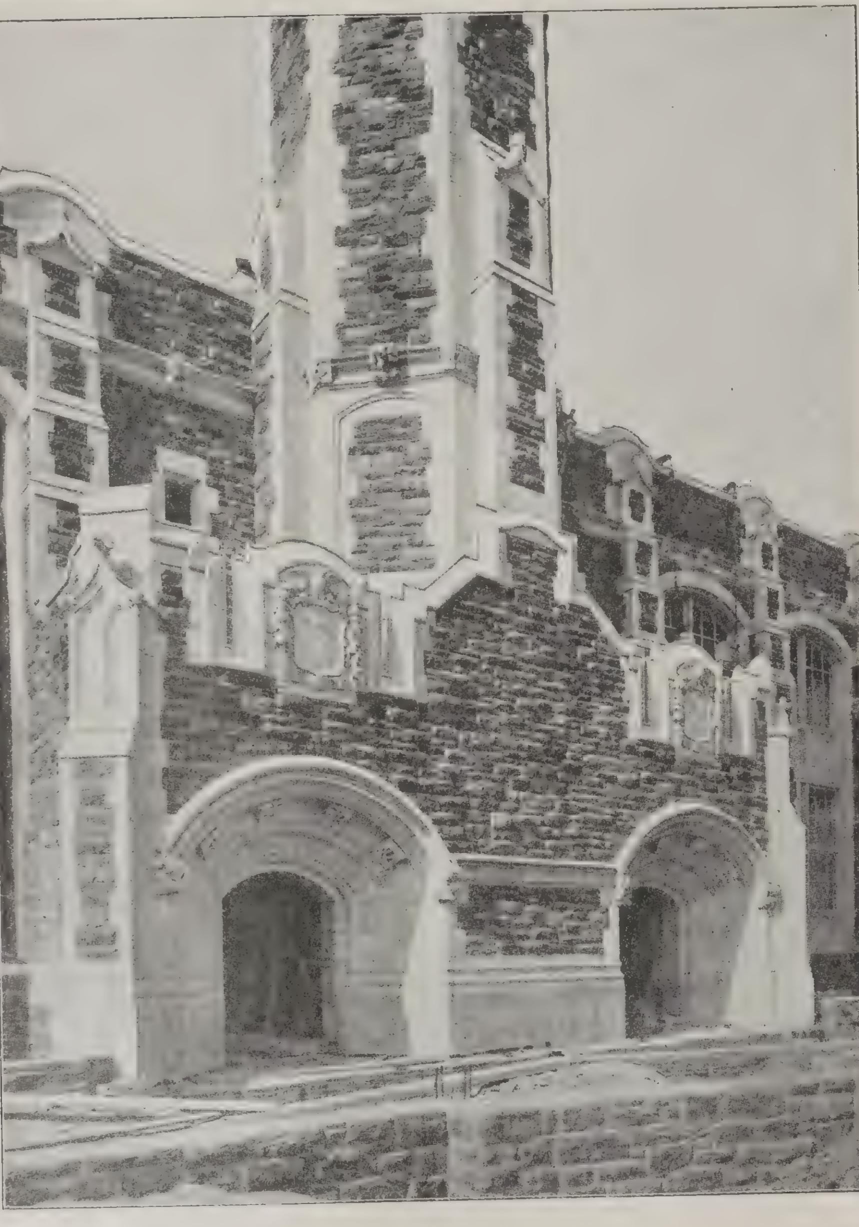
COWDENBEATH.—Premises have recently been acquired by the Cowdenbeath Co-operative Society at a cost of over £4,000, and it is now proposed to carry out extensive alterations at an estimated cost of £2,200. It is stated that the Post Office, which occupies a position upon this site, is to be abandoned, and a new one erected on a larger scale at the north end of the town.

CULROSS. — An extensive building scheme at Lower Valleyfield, Culross, is now under the consideration of the directors of the Fife Coal Company. Sinking operations have for some time past been in progress in connection with two pits which will be amongst the largest in Fife, and will give employment to between 1,500 and 2,000 men. The sinking of the pits is expected to be finished in about two years, and the building project of the Company will mean practically the establishment of a new village in the West of Fife.

FOLKESTONE.—The proposed enlargement of the public library, the cost of which Mr. Andrew Carnegie has promised conditionally to defray, will probably be started upon shortly. The result of a fête which was held to assist the extension fund, has been to make Sir Edward Sassoon, the Borough member, responsible for a contribution of about £700, Sir Edward having promised to supply the deficit.

FOSDYKE.—The Holland County Council has obtained the sanction of the Local Government Board to borrow £18,500 for the erection of a new swing bridge across the River Welland. The tender of Messrs Andrew Handyside and Co., of Derby, at £16,835, has been accepted.

LEICESTER.—A Local Government Board inquiry in respect to the application of the Council for a loan of £5,000 for the purpose of extending the Museum and Art Gallery, has been held. The Town Clerk, after narrating the causes that had prompted the application, pointed out that, in view of the urgent alterations which had become necessary, including the erection of a heating chamber, etc., at a cost of £576, the improvements to the western block facing the New Walk, which would cost £4,500, while the alterations to the hall, staircase, and first floor would involve £1,300, making £6,376 in all, the required loan was justified. Among the objections that have been raised against the alterations is the usual one of financial stress, and one of even more force, namely, that the site of the proposed extension is a public space and the property of the ratepayers. The cost of the building from its inception has been £18,000.



COLLEGE OF THE CITY OF NEW YORK. ENTRANCE, MECHANICAL ARTS BUILDING. GEORGE B. POST, ARCHITECT.

For description, see page 181.

MAIDSTONE.—The plans of the proposed isolation hospital having been approved by the Local Government Board, it has been recommended that tenders be invited for the erection of the building.

MATLOCK.—A scheme for the development of the Hall Leys Estate, a piece of centrally situated land about 20 acres in extent, is under the consideration of the Town Council. Suggestions having been made for the erection of a pump room, a concert hall, the provision of an ornamental lake, etc., the chairman of a recent meeting wisely advocated leaving the disposition of the scheme to the architects who would be invited to compete.

NORWICH.—For the erection of alterations and additions to the Norfolk and Norwich Hospital, the sum of £21,669 is required, and a like sum will also be necessary for endowment. The King has signified his intention to lay the foundation stone of the first of the series of new buildings on the occasion of his visit to Norwich on October 25th.

PEEBLES.—The recent destruction by fire of the administrative block of the Peeblesshire Fever Hospital, has been considered by the Joint Hospital Committee a suitable opportunity for the construction of a new building on a larger scale. The estimated cost of erecting and furnishing the building is £1,600.

RATHMINES.—The site upon which it has been proposed to erect a new public library having been found to be unsuitable, a committee has been appointed to institute inquiries into the question, with a view to obtaining one more desirable.

SOUTH SHIELDS.—The foundation stone of St. Oswin's Church, South Shields, is to be laid shortly. The site is in Stanhope Road, and the amount required for the first section of the buildings is £1,300.

STIRLING.—The safety of the old bridge which was built in the early part of the fifteenth century, is again menaced. Extensive restoration was carried out about twenty-eight years ago, but in spite of this the fabric again shows alarming signs of decay. The Provost and Town Council have taken up the matter, and will appeal to the Government to aid them in the preservation of this ancient monument.

TRURO.—It has been decided to build the tower of St. Paul's Church, Truro. The church was to a large extent remodelled from designs of the late J. D. Sedding. A set of tubular bells has already been promised for the new tower, which is to have figures at the corners instead of pinnacles. Mr. Edmund Sedding has been appointed architect for the tower.

WANDSWORTH.—An important addition, which is to be made to the Home for Aged Jews, is to provide accommodation for six married couples. The entire cost, both of erecting and furnishing the annexe, is being privately defrayed. The donor proposes to endow the new building, and this will involve a further donation of between £8,000 and £10,000.

WREXHAM.—An appeal for the erection of a memorial to Morgan Llwyd, the Welsh Puritan who has done so much to enrich Welsh literature, has been made.

Works in Progress and Completed.

ABBASSIO (EGYPT).—The contract for the erection of new barracks for the Egyptian Government, has been secured by Messrs. Henry Lovatt, of Wolverhampton. The barracks, which will take 3½ years to build, will be somewhat similar to those erected on Salisbury Plain. Concrete blocks are to be used in their construction.

BLACKPOOL.—The new police station which has been erected at Hawes Side to plans prepared by the Borough Surveyor, Mr. J. S. Brodie, is a two-storeyed building of red brick, with Accrington faced brick on the north and front elevations, with Nelson stone dressings. The buildings will probably cost £3,000. The general contractor for the work was Mr. James Eaves, of Blackpool.

BLYTH.—A bust of the late Lord Ridley has been unveiled. The present Viscount, who officiated at the ceremony, in the course of a speech observed, he believed landowners and town councillors should, in respect of town planning, look well into the future. He had had advice from his agent and also from his brother, an architect, and he thought the architectural possibilities of Blyth were great. He thought with the advice of architects they could make Blyth not only beautiful, but in some respects a model of town planning. The modeller of the bust, which is a striking likeness of the nobleman it represents, is Mr. George Skee.

CORK.—The many alterations and improvements which have been made at the Palace Theatre have been carried out by Messrs. John Delany and Co.

DENBEATH.—The Wemyss memorial hospital, whose cost has been entirely defrayed by Lady Eva Wemyss, was opened recently by that lady. The hospital is Scottish Baronial in style, and is equipped with every convenience. In the main building there are two large wards, with accommodation for six patients in each, and on pressure for double that number; an emergency ward for two or more patients; an operating theatre; and an administrative block, consisting of matron's, doctors' and nurses' rooms, etc. The laundry block is situated to the west of the main block, and a small chapel and mortuary occupy a corresponding position on the east side. The turret roof above and beyond the redstone pillared entrance to the hospital contains a large four-dial clock, with Westminster chimes. The hands of the clock are of novel design, representing a miner's pick and shovel. Mr. Todd was the architect.

FRANKSBRIDGE, RADNORSHIRE.—The new Baptist Church, which has been built here at an approximate cost of £950, provides accommodation for 250 worshippers.

KINGUSSIE.—The foundation stone of a new public hall in connection with the parish church has been laid. The cost of the building has been estimated at £900.

METHUEN.—The new auxiliary hall, the foundation stone of which was recently laid, will accommodate about 200 people, and is estimated to cost between £600 and £700. Mr. G. P. R. Young is the architect, and Mr. John Reay the builder.

SCOTSTOUN.—The new school which has just been opened at Victoria Drive, is three storeys in height, and is planned on the corridor system. On the ground floor is the infant department, attached to which is a large assembly hall, divided from the main corridor by a series of arches. On the first floor is the junior department, also with a large hall corresponding to that of the infant department. The upper floor is devoted to senior and higher grade departments. A gymnasium has also been provided, and will be fitted up with the new Swedish physical training apparatus. The architects are Messrs. Kerr and Watson, Johnstone, and the measurers Messrs. Shearer and Marr, Glasgow.

Notes and News.

Where Dwellings are Scarce.

Rochdale is just now enjoying a remarkable distinction. Almost alone among English towns, it shows a shortage of dwellings. Councillor Shawcross, moved by the touching tale of indefinitely postponed weddings, and other hardships of the homeseeker, has moved for a committee of enquiry.

* * *

Carpenter as Sculptor.

The memorial bust, in bronze, of the late Lord Ridley, which has been presented to Blyth by Lord Ridley, has been unveiled in the Ridley Park, Blyth. It was modelled by Mr. George Skee, a young carpenter of Blyth, whose clever work attracted the attention and interest of Lord Ridley, and it was subsequently executed in bronze by Mr. Alexander Parlanti, of Fulham.

* * *

A New Free Library for Folkestone.

Some months ago Mr. Andrew Carnegie promised to give £5,000 for the enlargement of the Folkestone Library on condition that the inhabitants raised, otherwise than by rates, the sum owing on the site proposed to be utilised. The Mayor issued an appeal, and a fête has been held to assist the fund. At the close the Mayor announced that a communication had been received from the borough member, Sir Edward Sassoon, stating that he would contribute whatever amount was required after the results of the fête were made known. About £700 is the sum the hon. member will be asked for.

* * *

A New London Hotel.

The Strand Palace Hotel, which will be opened on September 14th, occupies the site of Exeter Hall, famous as a centre of religious and philanthropic work, and as the home of the Young Men's Christian Association. The new hotel has only a comparatively small frontage to the Strand, where its main entrance is placed, but it extends behind the adjoining buildings to Exeter Street and Burleigh Street on either side, and also to Exeter Street in the rear. The hotel contains 470 bedrooms. On the ground floor there is a winter garden, adjoining the Strand entrance, and near it are a handsome drawing-room (with writing-room attached), and a large public dining-room. In the basement are a grill-room (also entered from the Strand) and billiard and smoking rooms.

* * *

Preservation of Ancient Monuments.

The Limerick County Council have had before them a report from the County Surveyor, Mr. John Horan, on the question of obtaining for preservation the possession by the Council of the ancient monuments in the county not already under the charge of the Board of Works. One tenant had refused to comply with the Council's request, and another was willing to meet the views of the Council if she received compensation. Mr. P. J. O'Sullivan, solicitor to the County Council, pointed out that under the Land Purchase Act of 1903 the Council may, with the consent of the Commissioners of Public Works, declare that any ancient monument or property shall not pass to the purchaser, and make an order investing such monument with the Commissioners. After some discussion, it was decided to refer the correspondence on the matter to the Board of Works.

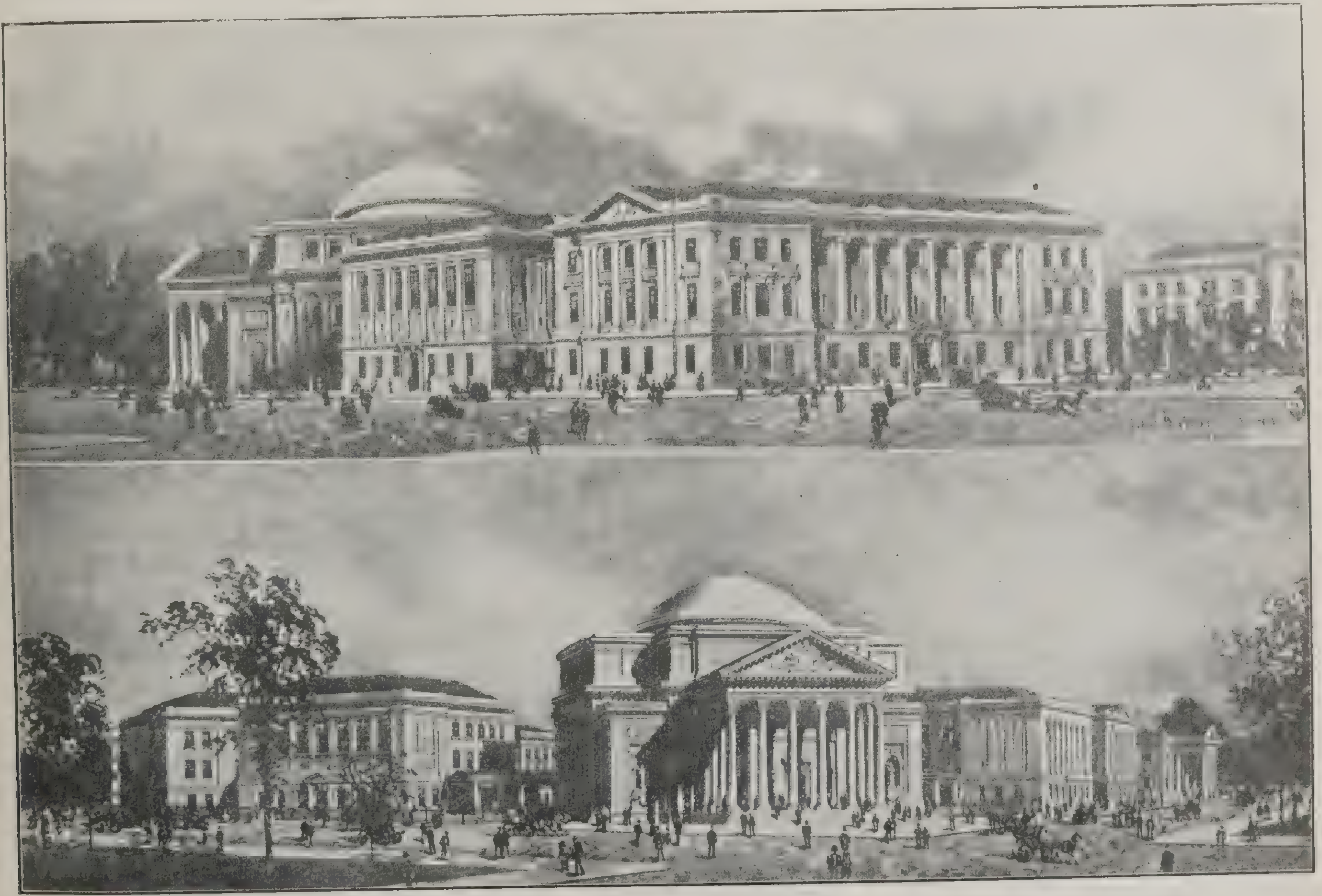
Local Tender v. Lowest Tender.

At the first meeting of the West Ham Board of Guardians after the summer recess, the Board discussed the tenders of 23 firms for the erection of receiving homes at Wanstead. The prices quoted ranged from £28,321 to £20,646. The latter price, which was the lowest, was quoted by H. J. Carter, of Grays, and it was proposed that the firm should have the contract. The Rev. A. G. Suttle moved as an amendment that the contract should be given to A. E. Symes, a local firm, asking £20,919. There was, he said, a tremendous number of unemployed in the district, and they would not gain the slightest benefit if the contract were given to an outside firm. The Chairman, opposing the amendment, begged the Board to adhere to the principle they had fought so hard for in the past. The local firm, however, got the contract, the votes being 15 to 11. The architect's estimate for the work was £20,000.

* * *

Sir Cuthbert Quilter's Model Cottages.

Mr. E. G. Pretyman, M.P., accompanied by Lady Beatrice Pretyman, Sir Cuthbert Quilter, and Mr. Geoffrey Drage were present at a formal inspection of some model cottages for aged labourers which Sir Cuthbert had erected on his Bawdsey estate. Mr. Pretyman said they appeared exactly to carry out the ideas embodied in his Bill, the object of which was to enable local authorities to provide cottages for labourers who were no longer able to occupy the cottages they had been paying for, partly in rent and partly by labour. It was a difficulty that affected labourers, farmers, and landowners, and it was desirable in settling it that the labourer should not be offered charity. Sir Cuthbert had provided cottages which could be let at a sum which would offer some return for the outlay. Having seen the cottages he should feel his hands strengthened in advocating the Bill that he had introduced. He would be able to refer to them as an example to be followed by county councils and others.



GEORGE WASHINGTON MEMORIAL BUILDINGS, WASHINGTON D C. GEORGE B. POST AND SONS, ARCHITECTS.

The design for the group of buildings for the George Washington University—part of the great monumental plan of the Capitol City of the United States—was selected in competition in 1905. For description see p. 183.

Improved Ordnance Survey Maps.

In a letter sent by the Board of Agriculture to County Councils and County Borough Councils indication is given of a proposal to improve the Ordnance Survey maps. A general revision of the Ordnance Survey maps on the scale of one inch to a mile and on smaller scales, occurs at intervals of fifteen years, and except in the case of railways, changes which take place after such a revision have not hitherto been shown on the maps until after the next general revision of the district. The councils have been informed that the Board propose in future to include in the maps any important additions, alterations, or corrections, such as the construction or demolition of main roads, canals, bridges, and other works affecting communications and the erection of large engineering works and other buildings of importance, without waiting for the next general revision. The Board ask that the councils should instruct any of their officers who may be cognisant of such changes to inform the Director-General of the Ordnance Survey, Southampton, when any change occurs of sufficient importance to be shown on a scale of one inch to a mile.

* * *

Shakespeare's Globe Memorial.

As mentioned in an editorial note in last week's issue, Sir H. Beerbohm Tree has consented to unveil in Park Street, Southwark, on October 8th, a mural memorial indicating the site of the Shakespeare Globe Playhouse, Bankside. Promoted by the Shakespeare Reading Society, of which Sir Herbert is President, as the result of a meeting at Lady Brassey's Park Lane residence in April, 1908, the memorial has been designed by Dr. William Martin, F.S.A., and executed by Professor Lantri, of the Royal School of Art, South Kensington. It shows in bronze relief Bankside in the time of Shakespeare, the Globe Playhouse forming the central feature, with the Thames and London Bridge in the background. A medallion bust of the poet appears in one corner, and an inscription runs: "Here stood the Globe Playhouse of Shakespeare, 1598-1613. Commemorated by the Shakespeare Reading Society of London, and by subscribers in the United Kingdom and India." The site of the old Playhouse is now covered by the brewery of Messrs. Barclay and Perkins, and so far as has been ascertained it is within 80 ft. to 100 ft. from Bank End. In 1613 the theatre was burned down, and was re-erected in the following year. The memorial measures 5 ft. 6 in. by 3 ft. 6 in., and it will be placed upon the wall facing Park Street.

* * *

A Shed for Dirigibles.

The War Department has placed with the Cleveland Bridge and Engineering Company (Limited), of Darlington, the contract for the construction of a building for the housing of dirigible ballons at Cove Common, South Farnborough. This building will be of steel construction, and have a length overall of 360ft., and an extreme width of 115ft. Its semi-circular roof will have a height at the centre of 75ft. Designs were invited from only four of the principal British structural engineering firms, and that of the Cleveland Bridge Company was preferred, although the amount of their tender was not the lowest. The shed has to be completed and handed over to the military authorities within 20 weeks from date.

* * *

The timber tithe barn of the Abbey of Peterborough, which was erected in 1306, was pulled down some years ago and the materials purchased by Mr. Fox, F.S.A., of London, who has now offered them to Peterborough Town Council with a view to their re-erection on another site. The building is 40ft. high, 80ft. long, and 32ft. wide. The council will give a reply in about a fortnight.

* * *

A French contemporary, in recording that a national museum at Cardiff is to be built, and that competitive designs are being invited, states that "the jury is composed of sir Aston Wibb, Mr. John James Burnet, and Mr. Edwin T. Hall." Burnet we know, and Hall we know, but who is Wibb?

* * *

"Most Wasted Site in Europe."

Mr. C. Ruding Bryan writes to a daily contemporary: "I was much struck by the boldness and truth in the statements of your correspondent concerning the unworthiness of the building in which our national collection of pictures is housed in Trafalgar Square. The position of the building—'the most wasted site in Europe'—is possibly the finest that London can now offer for such an institution; but that it has not been taken sufficient advantage of is apparent to all. Occupying the highest ground in the square, the National Gallery has the lowest skyline, and with its meaningless portico and detached columns scattered along the facade, it has justified the clamour for its demolition. This Corinthian order—a remnant of old Carlton House—naturally limited the architect when designing the Gallery, but it might still be preserved in a more truthful manner than was the fashion at that time. The galleries themselves—excluding their decoration—have much to commend them in point of size and proportion, but are unsymmetrically planned. In our latest museum at Kensington—a model of museum-planning, if not of art—we feel all the advantages of modern construction, which should, with similar success, be applied to our National Gallery of pictures. If, as a nation, we are less artistic than our neighbours, who suitably house the collections they form, we probably shall not rival the veteran magnificence of their galleries; but to copy with reasonable freedom is surely more virtuous than wilfully to ignore the benefits of example."

The substantial and picturesque new bridge over the River Wey, at Guildford, which was formally opened by the Mayor and Corporation on August 25th, was erected from the designs of Messrs. Clemence and Moon, architects, Guildford, Messrs. Henry Adams and Son, of 60, Queen Victoria Street, London, acting as consulting engineers.

Our Plate.

Further specimens of the admirable work that is being done in Liverpool University School of Architecture under Professor Reilly show a study of the Erechtheum, by Mr. W. Allan, and Mr. Ernest Gee's reproduction of features of the Lysicrates Monument. It is surprising that these studies can be invested with so much freshness and feeling; which qualities are even more pronounced in the water-colour originals from which our black-and-white version is reproduced.

In Parliament.

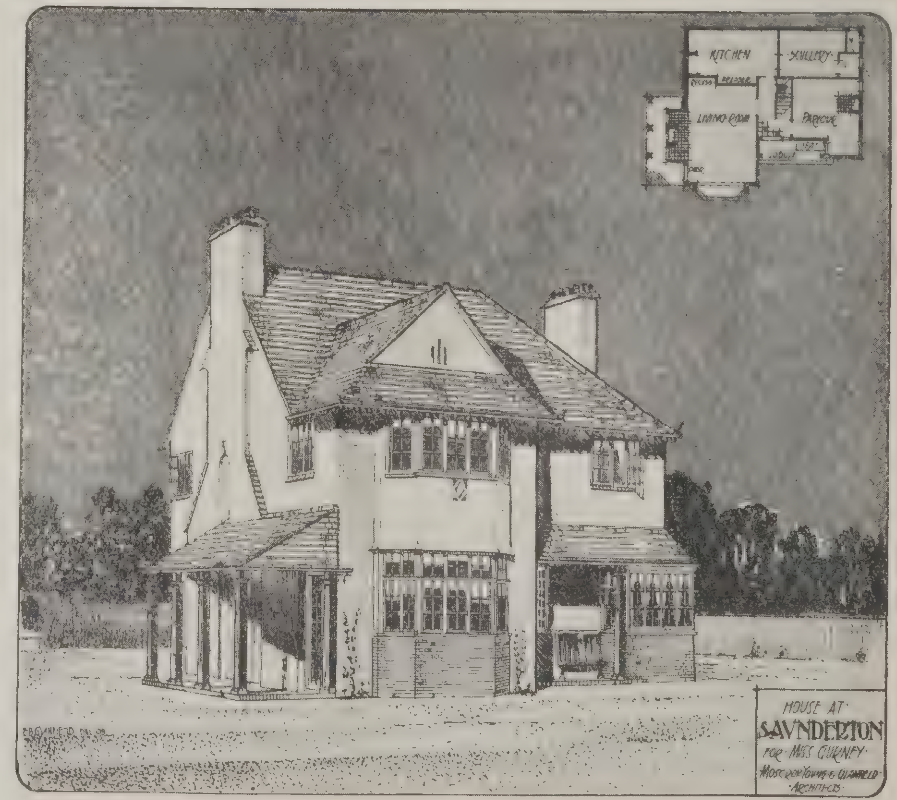
Places of Historic Interest.

Mr. Horniman asked the Chancellor of the Exchequer whether he had considered the request of the National Trust for Places of Historic Interest or Natural Beauty that land conveyed by gift or purchase, and dedicated to the use of the public and held by the National Trust or any such public body, should be exempt from stamp duty under Clause 53, Sub-section 1, of the Finance Bill. Mr. Lloyd George has replied that he has considered the communication sent to him by the National Trust, but he regretted that he did not see his way to accede to their request for the specific exemption from stamp duty under Clause 53 (1) of the Finance Bill. In exceptional cases of established hardship power already existed for granting relief.

* * *

Labour Exchange Appointments.

Mr. Summerbell asked the President of the Board of Trade, in regard to the appointments to be made shortly as to the Labour Exchanges to be set up, if he could state whether it was the intention of the Government to subject candidates to an examination test; and, if so, whether he could indicate the nature of such examination, especially in view of the fact that Labour Exchanges as proposed to be set up are new to this country. Mr. Churchill: The conditions of employment of the staff required are not yet definitely decided, and I am therefore un-



The pleasant homeliness of the elevation is confirmed in the comfort and convenience indicated by the plan, in which due importance is assigned to the living-room.

LIBRARY
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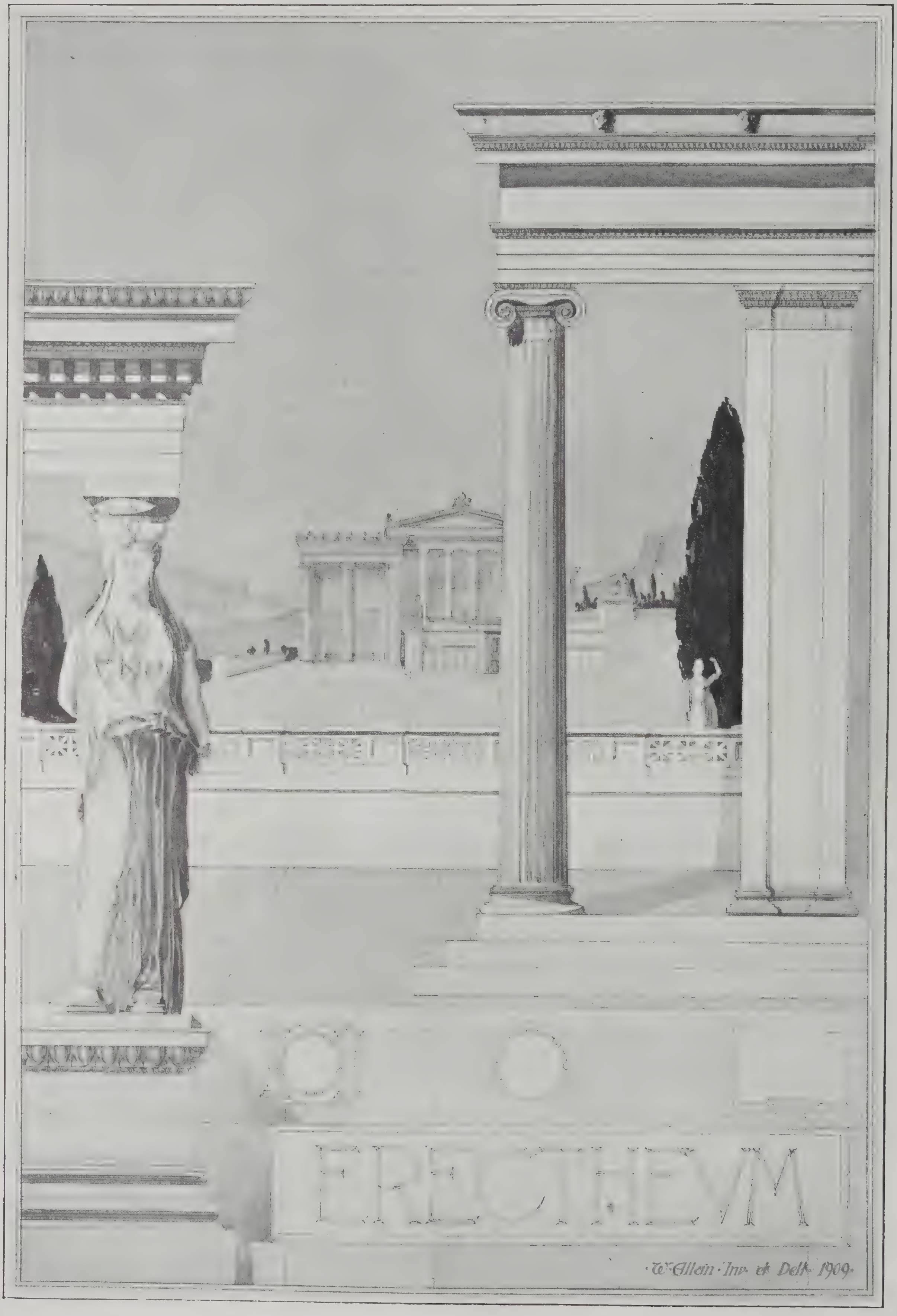
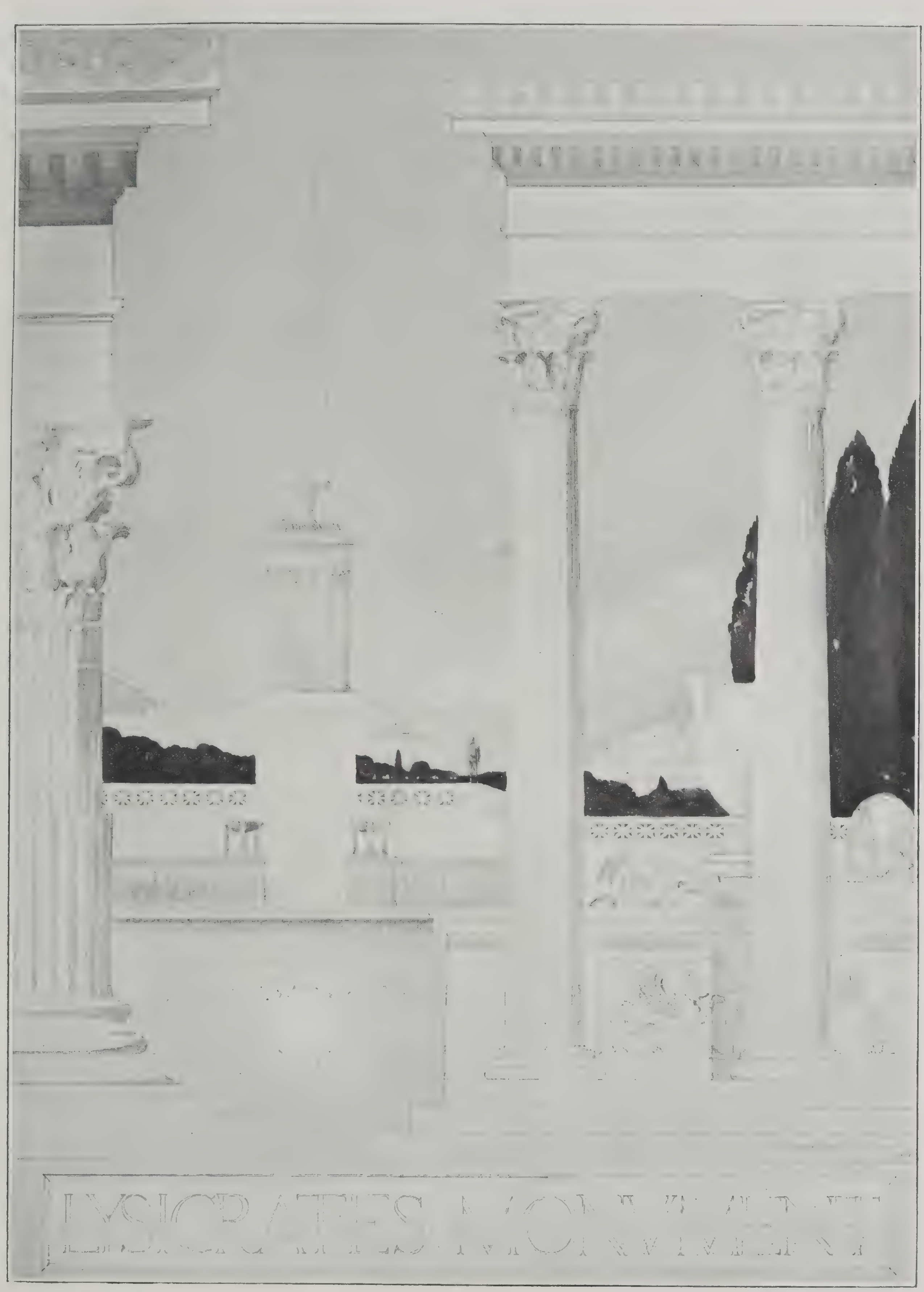
Supplement to THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER, *Wednesday, September* 8, 1909.

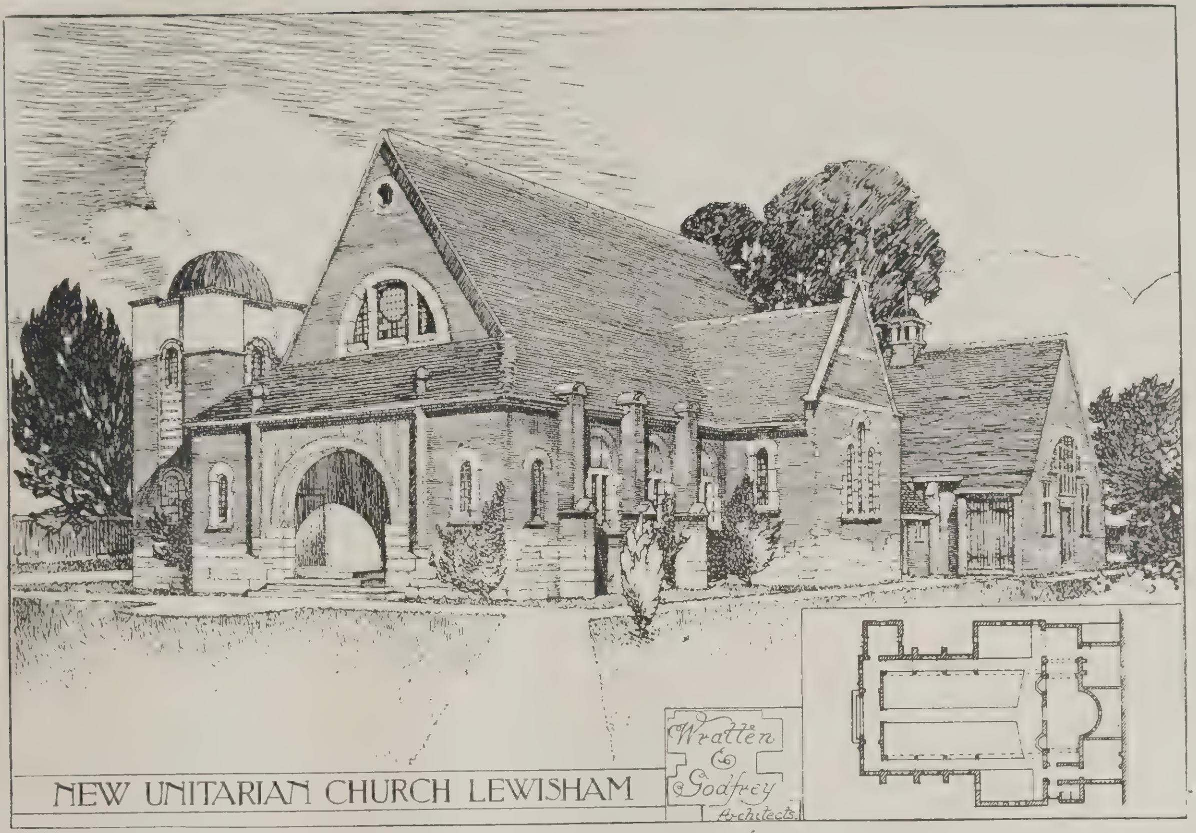

ERECTHEVM
W. Allan · Inv. et Delt. 1909.

By W. ALLAN.

WATER-COLOUR STUDIES OF THE ORDERS, BY STUDENT



By ERNEST GEE.



This church is built on a base of Kentish Rag stone, with Dutch brick facings, and the roof is covered with hand-made tiles.

able at the present time to reply to the honourable member's question. I doubt, however, if the ordinary type of Civil Service examination would be altogether well adapted to test the qualifications of candidates for some of these appointments.

* * *

The Housing Question.

Mr. Keir Hardie asked the Prime Minister whether his attention has been drawn to the action of the proprietors of an estate in Merthyr, who had refused to sell or lease land to the Merthyr Borough Council for the erection of workmen's dwellings on the plea that the housing scheme of the council did not seem to be of an advantage to the estate; and whether it was intended by legislation or otherwise, to take from landowners the power to withhold land when required for housing or other public uses. Mr. Burns: The Prime Minister has asked me to reply to this question. The town council have sent me a copy of a letter which they have received from the solicitors to the owners of the estate referred to, and which is to the effect stated in the question. Local authorities are already empowered by Section 57 of the Housing of the Working Classes Act, 1890, to apply to the Local Government Board to enable them to purchase land compulsorily for the purpose of providing houses for the working classes; and I may add that under the Housing, Town Planning, etc., Bill now before Parliament the procedure in relation to this matter is proposed to be considerably simplified and improved.

Cinematograph Bill and Structural Alterations.

In the House of Commons, when the amended Cinematograph Bill came up for consideration, Mr. Cooper drew attention to the restrictive regulations, especially as they would apply to the entertainments given by religious associations on the Saturday evenings without their being able to make the necessary structural alterations in churches, chapels, schools and similar buildings. He moved an amendment in Clause 7 (Application of Act to special premises) providing that it should not be necessary to obtain a licence for premises "connected with a church or chapel or mission hall or public elementary school, and are not used more than one evening in any week from the first day of October to March 31st in the following year."

Mr. Lardner seconded the amendment, and pleaded for the consideration of such exhibitions in buildings connected with schools and chapels in remote districts of Ireland.

Mr. Gladstone said that he could not accept the amendment, pointing out that the object of the clause was to provide for occasional performances as distinct from regular performances. The amendment would interfere with the casual performance of the cinematograph, which the Government under this clause were trying to safeguard. He was certain that the county council would look after the safety of the public in all the smaller places of entertainment; but it was needful to provide against the danger from fire and against the dangers caused by panic. There was no intention to insist upon the enforcement of unreasonable regulations.

After some further discussion, in the course of which Mr. McVeigh (Donegal, E.) said the danger in these cinematograph entertainments did not come from the building, but from the incompetent operator, the amendment was withdrawn.

On the motion for the third reading of the Bill, Mr. Harmood-Banner (Liverpool, Everton) complained that for the purposes of the Bill the county councils were put above all the non-county boroughs. It might be all very well in the case of small agricultural towns, but in the case of the larger towns in Lancashire and Yorkshire, having their own regulations, it was a very serious matter. He hoped that in another place this would be looked into.

Mr. Gladstone said that if there was such a strong feeling in the quarter the hon. member opposite represented, it would have been better if his attention had been called to the matter when he introduced the Bill.

The Bill was read a third time.

With funds raised by public subscription, a drinking fountain of marble and white stone was erected at Lower Edmonton last week in commemoration of the King's Coronation. Why this precipitate haste?

Correspondence.

[*The Editor declines responsibility for the statements made by correspondents.*]

Builders' Locked-up Capital.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—The members of the building trade are deeply indebted to you for the very lucid and forcible article in last week's journal upon the disastrous effects of undue and protracted delay in the payment, more especially of the final balances, upon completed work. In many instances two, and sometimes three, years elapse before the last payment is made. During that time the builder's capital is not only locked up but wholly unremunerative. There is usually a penalty clause in contracts to enforce completion of the work contracted for within a certain date. It would be nothing more than equitable to have a penalty clause enforcing payment within a certain date, with the usual conditions of so much to be paid per day or per week, as in the case of non-completion at the specified time.

Looking at the subject from a builder's standpoint there is no reasonable excuse why his side of the bargain should not be as well guarded as the building owner's side. A large number of builders within my own knowledge have come to grief through their capital being locked-up and practically used for years by the persons who own the buildings.

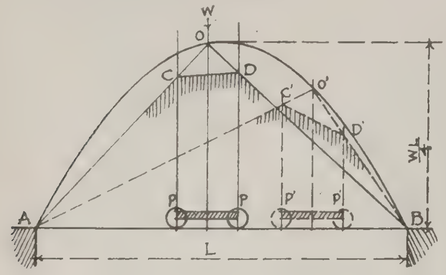
M.

Gantry Girders.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Referring to the problem in your issue for August 11th, the bending moments for a rolling load on two wheels can be found very simply by the following graphical method, which I have never seen published:

Set up a parabola whose height is $\frac{WL}{4}$ (W being the total load $P+P$), then assuming the load to be carried on one wheel at the centre of gravity of the loads carried by the two wheels, the bending moment will follow the line of the parabola, as the single load passes over the girder. At any point O the actual bending moment for the two loads is found by joining OA and OB, cutting the centre lines of wheels at C and D. ACDB is the bending moment diagram.



This method applies whether the wheels carry equal or unequal loads.

Where only one wheel is on the girder, the other being on the abutment, the BM follows the line of a parabola, whose height is $\frac{PL}{4}$.

D. W. R.

Edinburgh.

Law Case.

Effect of Trade Depression.

In the High Court of Justice (King's Bench Division), on August 31st, Messrs. W. Lawrance and J. J. Porter, trading as E. Lawrance and Sons, Builders and Contractors, who had carried on business at Wharf Road, City Road, N., attended for public examination, a receiving order having been made against them on May 21st last. Their statement of affairs showed gross liabilities amounting to £147,288 2s. 5d., of which £36,945 1s. 4d. was expected to rank, and assets estimated to produce £52,524. In answer to Mr. W. G. Williams, Assistant Official Receiver, Mr. Lawrance stated that the business which Mr. Porter and he had carried on was established in 1873 by his father, who died in September, 1898. Mr. Porter and the witness had become partners in 1882. His father's capital at the time of his death was £30,000, and a sum of £19,000 had since been paid out to the beneficiaries under his will; £9,000 had been carried to the credit of witness and his partner; and the remainder was allowed to be in the business, at 5 per cent. interest. Proper books of account had been kept, and they were balanced every year. Trading was successful until two or three years ago, when it fell off owing to slackness in the building trade, and they were unable to realise their properties in the present depressed state of the market. They had brought in a scheme under which the mortgagees would allow them time to realise the properties, and the scheme had been accepted by the creditors. If the properties were realised at the present moment in bankruptcy there would be a considerable loss. He had promises from all the second mortgagees and some of the first mortgagees that they would allow time for realisation. Mr. Porter stated that he agreed with the answers of his partner, and the examination was ordered to be concluded.

BERKSHIRE COUNTY COUNCIL NEW OFFICES, &c., READING.

ASSESSOR'S AWARDS.

At the moment of going to press, we have received intimation by telegraph that the following awards have been made in this competition:—First, Messrs. Warwick and Hall; 2nd, Mr. Shrewsbury; 3rd, Messrs. Hills and Anderson. Mr. Mervyn E. Macartney, F.R.I.B.A., was the assessor, and the premiums are £100, £75, and £50. Time will not admit of verification, but we suspect that "Hills and Anderson" should read "Wills and Anderson," "Hills" being presumably an error made in transmission.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Oct. 1.	ABERDARE HOSPITAL. The Aberdare Urban District Council invite competitive designs for a fever hospital for 52 patients, including administrative block, outbuildings, etc. Premiums of £100, £50, and £25 for the designs placed first, second, and third respectively. An Architectural Assessor will be appointed on the nomination of the President of the Royal Institute of British Architects: also a Medical Assessor to act jointly. Particulars and conditions of the competition, together with a plan of the site, may be obtained from T. Phillips, clerk, Town Hall, Aberdare, on deposit of £3 3s.
Oct. 11.	HULL TRAINING COLLEGE for Teachers in Elementary Schools. The Education Committee invites Architects to submit designs. Premiums of £150, £100, and £50 to authors of the designs placed 1st, 2nd, and 3rd respectively. Particulars and plan of site may be obtained of J. T. Riley, Secretary of Education, Albion St., Hull. Deposit, One Guinea, returnable on receipt of *bona fide* design, or the return of particulars within 14 days.
Nov. 30.	HERNE BAY PAVILION ON PIER. Herne Bay Urban District Council invite competitive drawings for a pavilion to be erected on the proposed extension of the pier at a total cost not exceeding £4,000, exclusive of architect's commission. Premiums of twenty-five guineas and ten guineas respectively will be awarded for such two designs as shall be judged of sufficient merit by the Council, and placed by them as first and second; the premium of twenty-five guineas to be afterwards merged into the usual commission payable to the architect, provided the work is carried out by such competitor. Plan of the site and copy of the conditions may be obtained on application to the undersigned on and after the 24th instant on payment of one guinea, which will be returned on receipt of a bona-fide design. Drawings to be deposited at the Clerk's Office, Town Hall, Herne Bay, not later than noon on the 30th November next.—Joseph Jubb, Clerk to the Council, Town Hall, Herne Bay.
No date.	NATIONAL MUSEUM OF WALES The Council desires to receive competitive designs for the erection of a new National Museum at Cardiff, Three premiums are offered. The Council have appointed Sir Aston Webb, R.A., Mr. John J. Burnet A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A., as Assessors. Particulars and plans of the site will be supplied to competitors on payment of a fee of £2 2s., which will be returned on receipt of a design in accordance with the conditions, or if all papers are returned within 14 days. Inquiries to be addressed to Dr. Wm. Evans. Hoyle. Director of the Museums, City Hall, Cardiff.

REVISED AGREEMENT WITH THE PLASTERERS.

The revised agreement between the National Federation of Building Trade Employers, the National Association of Master Plasterers, and the National Association of Operative Plasterers, has now been signed on behalf of each of the parties. The genesis of the revision is clearly expounded in Mr. J. B. Johnson's report on the negotiations, which appears on page 156 of our issue for August 25th.

AMENDED GENERAL RULES, as agreed between the National Federation of Building Trade Employers of Great Britain and Ireland, the National Association of Master Plasterers, and the National Association of Operative Plasterers, September 1st, 1909.

No compulsion to become or cease to be Members.

1. The National Association of Operative Plasterers will not take any steps to compel men regularly employed as foremen or superintendents of Plasterers to become Members of the N.A.O.P., and the Employers will not take any steps to compel any men to cease their membership of, or prevent them joining the Operatives' Society.

Apprentices, number of and binding of.

2. No Employer shall engage any additional Apprentices to the Plastering Trade while the number of his Apprentices shall exceed one fourth of the number of Journeymen Plasterers then employed by him. All apprentices shall be legally bound, the Indentures to be open for inspection of the Operative Society within three months of the employment of the said Apprentices.

Rules enforced, no boycotting, etc.

3. No boycotting or blacklisting shall take place by the N.A.O.P. in future, where the firms adhere to the Rules mutually agreed upon, and should any firm be engaged to do any portion of Plastering Work, and do not pay the recognised rate of wages, it shall not be considered a violation of this Agreement, should the N.A.O.P. enter a protest. The Employers agree that such Rules shall be strictly enforced in all parts of their Contracts.

Demarcation Committees.

4. For the purpose of demarcation of work, Joint Committees shall be established in the different Districts, equally representative of the Employers and the Mechanics, whose representation shall be equally divided amongst the different branches of the trade in question. These Committees shall, as far and as soon as is possible, draw up schedules of the work which it is recognised belong to certain branches of the trade. To such Committees shall be immediately referred all points of dispute as to demarcation, and the decision of the majority in each case shall be accepted as binding on both sides. Should they fail, however, to decide, then the matter shall be referred for settlement to a similarly constituted Joint Committee, representative of the National Federation of Builders and the other Societies affected, whose decision shall be final, provided that the Employers' representatives are bona-fide Employers of Plasterers direct. Pending such reference to the Local Committees, no strike or lock-out shall take place, but the decision of the Employer shall be provisionally accepted as to who shall do the work, provided that preference shall be given to that branch of the trade which, in practice, has done the work before in that District, and provided that no preference be given on account of the payment of lower wages.

Disputes arising, how dealt with.—Local Joint Committees.—Joint Committee of Appeal.

5. In the event of any dispute arising, written notice thereof shall be sent by the party aggrieved to the Local Associations of the Master Builders and Master Plasterers or to the District Officials of the N.A.O.P. as the case may be, who shall inform the complainant party whether the party complained of is a member of any of the said Bodies, if so the matter shall be considered by a locally constituted Joint Committee of Employers of Plasterers and Members of the Operatives' Union, which shall meet within six clear working days of the date of the said notice, with a view to an amicable settlement; failing a local settlement, or, if no Local Joint Committee operating in the locality, reference shall immediately be made to a Standing Joint Committee of Appeal, consisting of members of the Employers' and Operatives' Central Bodies, which shall meet within 10 days of the receipt of notice of appeal to consider any case referred from the Local Joint Committee.

In the event of the Local Joint Committee failing to consider the dispute within the said six clear working days the party aggrieved may forthwith refer the case to the Standing Joint Committee of Appeal which shall then meet and consider the case as aforesaid.

Until the said Standing Joint Committee of Appeal has met and discussed the grievance, no strike or lock-out shall be sanctioned by any of the parties concerned in any dispute.

Expiry of Notices for Revised Working Rules.

In the event of any duly given notice or notices by either side, for a revision of local rules expiring without a settlement or withdrawal of notice or notices having taken place, the parties shall in the first instance refer the matter in dispute to the aforesaid Joint Committees, and pending a decision of the said Joint Committees, local or otherwise, no stoppage of work shall be allowed on any pretext whatever.

Joint Committees, Meetings and Elections.

The several hereinbefore mentioned Committees shall meet annually in May to elect Officers and Joint Secretaries for the ensuing year, and to transact such other business as may be necessary. The names of the representatives elected on the said Committees for each year commencing May 1st must be forwarded to the respective Joint Secretaries at least 14 days before that date.

Regulations, power to make.

The Standing Joint Committee of Appeal shall have power to make such regulations governing procedure under the Agreement as it may think advisable subject to confirmation by the parties hereto.

Defaulters.

6. With regard to the alleged refusal of members of the N.A.O.P. to work with workmen who may not belong to a Trade Union, it is understood the men the Operative Plasterers object to work with are defaulters, and other men, who have been shown to the Employers to have made themselves specially objectionable to the Union men, but no objection shall apply to any defaults which may have occurred prior to the date of the Agreement of 1899.

Local Standard Rate of Wages.

7. No Employer shall be called upon to pay more than the local standard rate of wages to men engaged in a town or district where the work is being executed, and where no established rate exists, that of the nearest town or district shall be adopted.

Construing Rules.

8. These Rules shall be construed together, and in the light of each other.

NOTE.—The words "local standard rate" and "established rate" in Rule 6 shall mean "the current rate that is being paid by established custom in the locality."

Signed,
JOSEPH CLARK,
Chairman of E.C.
WILLIAM HARNEY,
Member of E.C.
T. OTLEY,
General Secretary.
On behalf of the National Association of Operative Plasterers.

Signed,
ERNEST J. BROWN,
President.
A. G. WHITE,
Secretary.
On behalf of the National Federation of Building Trades Employers of Great Britain and Ireland.

THOMAS LINDLEY,
President.
On behalf of the National Association of Master Plasterers.

REGULATIONS GOVERNING PROCEDURE under the Amended General Rules, agreed between the National Federation of Building Trade Employers, of Great Britain and Ireland, the National Association of Master Plasterers, and the National Association of Operative Plasterers, 1st September, 1909.

Joint Committees, duties of.

(a) Upon the Joint Committees established under the above named General Rules devolves the carrying out of the various clauses in the said Rules and of the following regulations.

The particular attention of the Joint Committees is requested in regard to Rule 2 of the General Rules, and it shall be their duty to see that as far as practicable all boys are indentured, and that boys passing from one Employer to another and having partly served their time, bring with them a statement from their former Employers duly endorsed to the effect that they have served a portion of their time satisfactorily.

Secretaries, appointment of.

(b) The Employers and Operatives on the several Joint Committees shall respectively appoint each a Secretary who shall summon the meetings, keep the minutes, and generally carry on the business of the Committees under the directions of the members at their officially summoned meetings.

Joint Committee, number of.—Joint Committee, convening of.—Vacancies, how filled.

(c) Each Joint Committee shall consist of not exceeding 10 Employers and 10 Operatives.

(d) All meetings of the several Joint Committees shall be convened by the Joint Secretaries.

(e) If any of the representatives on any of the Joint Committees die, resign, or otherwise cease to be qualified, a successor shall be appointed, and should any representative be unable to attend any meeting of the Committees, a duly appointed substitute may attend in his place.

Subjects, how brought forward.

(f) No subject shall be brought forward at any meeting of the Joint Committees except with the consent of a two-thirds majority of the representatives present, unless at least 6 days' notice thereof has been given to the Joint Secretaries.

Powers to discuss.

(g) Although the principal objects of the Joint Committees are the settlement of disputes as set forth in the Agreement of September 1st, 1909, it shall also be within their province to meet and discuss any question of trade interest at the request of any of the parties to this Agreement, providing that at least 10 days' notice in writing has been given to the Joint Secretaries of the Committee concerned setting forth the matter it is desired to discuss.

Area of Jurisdiction.

(h) The area of jurisdiction of any Joint Committee shall be the area in which the rules between the Masters' Association and the Operatives' Societies apply. In the event of an appeal being made to the Joint Committee of Appeal to consider a dispute and one side objecting on the ground that it is out of order, then the Chairman, Vice-Chairman, and two Secretaries of the Joint Committee concerned shall at once meet to consider the question and decide whether a meeting of the Committee shall be called. In those eligible localities where Joint Committees are not already formed, either section may take the initiative in forming or convening a meeting for the purpose of forming the Local Joint Committee.

Submission of Matter.

(i) The matter to be submitted to the Joint Committee should be definitely and specifically drawn up by the Secretary of the party lodging the complaint or appeal, so as to enable the Committee to consider and if possible give a decision upon the precise matters submitted to them. The case to be stated and the evidence taken should be scrupulously confined to the matter or matters definitely set forth in the appeal.

Power to Amend Appeal.

(j) The Joint Committees shall have power to amend the appeal to effectuate the real intention of the parties where the appeal has been erroneously or insufficiently drawn up. If a proposed alteration is a material one or will introduce new matter, there must be the consent of a majority of the Committee, the voting to be taken as hereinafter provided.

Date of Appeal.

(k) The date of appeal shall be taken to be the date when application was made by one of the contracting parties to the Joint Secretaries of the Joint Committee.

Proceedings at Appeal.

(l) The proceedings at an Appeal shall commence by the appellants making short statements of their case and calling witnesses in support of same. The other parties will be entitled to make a short statement of their case, call witnesses, and produce evidence. The appellants shall have a right to reply. All witnesses to be subject to cross-examination.

Witnesses.

(m) Witnesses shall only give evidence on matters which are within their personal knowledge, and hearsay evidence shall not be admitted. In case of illness or any other cause which makes it absolutely impossible for a witness to be present, the written statement of such witness shall be admitted, but must be signed and attested by two witnesses.

Evidence.

(n) All evidence and information in relation to the matter under consideration communicated by one of the parties or their witnesses or agents shall be in the presence of the other parties. All the evidence to be submitted by both parties shall be heard before the case is closed by the Joint Committee.

Case Closed.

(o) When the case has been formally closed the parties and witnesses shall retire, and no further evidence shall be heard or information communicated.

Members of Committee Representing Parties.

(p) If a member of the Joint Committee has represented one of the parties as a witness during the hearing, he shall retire when the case has been closed, and not take any part in the deliberation of the Committee while considering the evidence and arriving at their decision.

Minutes.

(q) Draft Minutes of all Meetings shall be mutually approved by the Joint Secretaries within a short period (say five days) and the record in both Minute Books should be identical therewith.

Regulations, how determined.

(r) These regulations are for the purpose of effectually carrying out the Agreement already agreed upon for the settlement of all disputes which may arise between the parties thereto, and any determination of the said Agreement either by effluxion of time or notice given by any of the parties thereto, will apply with equal force to these regulations.

Quorum.

(s) A majority of the representatives on each side shall constitute a quorum at any meeting of the Joint Committees. The voting power of Employers and Operatives to be equal in all cases.

Decisions and Voting.

(t) The decision of any of the Committees to be binding must be carried by a majority of votes of those present, and in the event of the attendance on each side being unequal, a unanimous vote of the numerically weaker party shall be considered equal in number to the unanimous vote of the stronger side, and the result shall be a tie; but should there be cross voting the decision shall be given in favour of the side securing a majority of such cross votes. The Chairman shall have one vote only as a member of the Committee, and shall not be entitled to give a casting vote.

Arbitration.

(u) Though in all ordinary cases the procedure shall follow the regulations above written, yet for the purpose of more quickly arriving at an agreement on matters in dispute, it shall be competent for any of the several Joint Committees by mutual and unanimous consent of the two parties to call in an arbitrator or arbitrators with power to settle the dispute, and where this is done the decision of such arbitrator or arbitrators shall be final and binding. In the event of an arbitrator or arbitrators being called in by any of the Joint Committees, the costs, if any, shall be borne in equal shares by the Employers and Operatives unless left to the discretion of the arbitrator or arbitrators by mutual consent of the Joint Committee.

Regulations, how altered.

(v) Any party desiring an alteration of these regulations shall give six months' notice in writing to the Joint Secretaries of the Joint Committee of Appeal, prior to the Annual Meeting thereof, and such notice shall at once be communicated to all the parties to this agreement, and the Joint Committee of Appeal shall have power to alter these regulations by a majority of votes of those present at the Annual Meeting thereof.

STANDING ORDERS

Governing Procedure in Debate.

1. All motions or amendments shall be reduced to writing by the proposer or seconder immediately on their being seconded.

2. Whenever an amendment is made on an original proposition, no further amendment shall be taken into consideration until the first has been disposed of.

3. If the first amendment be carried, it becomes itself an original question, whereupon a further amendment may be moved.

4. If the first amendment be negatived, then a second may be moved upon the original question under consideration; but only one amendment shall be submitted to the meeting at one time.

5. The mover of any original resolution, or of an amendment carried, shall have a right to reply before the question is put from the chair; but no other member shall be allowed to speak more than once on the same question, unless fresh evidence is introduced or the attention of the Chair be called to a point of order.

Signed,
ERNEST J. BROWN,
President.
A. G. WHITE, Secretary.
On behalf of the National Federation of Building Trades Employers of Great Britain and Ireland.
THOMAS LINDLEY,
President,
On behalf of the National Association of Master Plasterers.

Signed,
JOSEPH CLARK,
Chairman of E.C.
WILLIAM HARNEY,
Member of E.C.
T. OTLEY,
General Secretary.
On behalf of the National Association of Operative Plasterers.

Trade and Craft.

A New Domestic Boiler.

The National Radiator Company, Ltd., 439 and 441, Oxford Street, W. (works at Hull), send particulars of their new "Ideal" domestic boiler for hot water supply for domestic and other purposes, and for low pressure hot water heating. The "Ideal" boilers are constructed of cast iron, not of ordinary grades, but of a special mixture determined after more than thirty years' experience in the manufacture of boilers. As the efficiency and durability of cast-iron boilers are largely due to the quality of material used in their construction, care is taken to have every pound of iron not only carefully selected, but the castings subjected to daily tests and analyses in the laboratory. These boilers are, therefore, practically indestructible. Three 4-in. openings at the top permit the easy removal of the incrustation, without disturbance of the existing piping and smoke pipe connections. All the fire surfaces are backed with water, and therefore cannot burn out. The waterway is nowhere less than 3½ins. wide, and extends to the floor line; this not only facilitates cleaning, but provides large water storage capacity in the boiler itself. Two 4-in. openings are provided at the bottom for the removal of the sediment. These openings, as well as those at the top of the boiler, can be fitted with brass tapered plugs, making a tight joint without packing, and easily removed at any time for cleaning. The return tapping is 4¾ins. from the floor, so that even when a considerable quantity of sediment has collected at the bottom of the waterway, this will not be disturbed by the ebullition of the water within the boiler itself, and consequently a clean supply in the system will always be available. In private residences a self-contained boiler for the supply of hot water has a distinct advantage in convenience over the kitchen range boiler, and also ensures the maximum economy, as there is usually little need for hot water when the greatest heat is required, viz., when cooking is in progress, whilst the supply of hot water is generally found inadequate when it is most in demand. The "Ideal" domestic boiler is equally suitable for small installations of low pressure hot-water heating in conjunction with "Ideal" radiators or for the combined system of low pressure heating and hot water supply.

"A Century and a Half of Commercial Enterprise."

The Carron Company have just added to their series of neatly and even artistically produced booklets an interesting souvenir of the firm's completion of a century and a half of existence. The Carron Company was founded in 1759, and was virtually the pioneer of the iron industry in Scotland, and has enjoyed an unbroken business career throughout that long period. It was a Roebuck of Sheffield to whom was largely if not entirely due the inception of the firm—Dr. John Roebuck, an eminent mineralogist, who discovered some important improvements in the production of iron. It was he who, while in partnership with Samuel Garbett, as chemical manufacturers at Prestonpans, near Edinburgh, discerned the possibilities of exploiting the great mineral wealth then lying unheeded between the Forth and the Clyde. The company formed at his suggestion consisted of himself, Ebenezer Roebuck, Thomas Roebuck, William Cadell, sen., William Cadell, jun., Benjamin Roebuck, and Samuel Garbett, the junior Cadell being the first manager. The erection of the foundry works was begun towards the close of 1759, and the work of ironmaking at Carron was begun on January 1st, 1760, Dr. Roebuck piercing the furnace breast for the first flow of metal. It happened that Mr. Garbett was an enthusiast in military matters, and he urged the desirability of manufacturing cannon and cannon-balls. Hence the small naval gun of a distinctive type received its name of "Carronade." These guns played a most important part in the French wars at the end of the eighteenth and beginning of the nineteenth centuries, and became world-famous. The firm eventually abandoned for a long period the manufacture of firearms, but, a few years ago, made a large quantity of shells for the British Government. But, from the very outset of its career the firm has been identified with the manufacture of the implements of peace, and soon established a reputation for the excellence of its firegrates and other domestic appliances, as well as for agricultural implements. The company was incorporated by royal charter in 1773, when Dr. Roebuck severed his connection with the firm. In 1787, Robert Burns visited the works, but was refused admittance, whereupon he scratched a lampoon on the window of a neighbouring inn, to the effect that when he knocked on the gates of hell (a comparable place, *bien intendu*) he might be, in this similar application, equally unsuccessful. His poem, and a neatly turned epigram in reply to it, enliven the pages of this well-written account of the Carron Works. The first set of complete castings for the steam engine, the invention of James Watt, were cast here, and were erected at the house of Dr. Roebuck, who included also among his personal friends John Smeaton, of Eddystone Lighthouse fame, who designed and superintended several works for the company. The engines for the first steamship built in the United Kingdom were made at Carron Works. It is in the light foundry, which is the largest of its kind in Scotland, where the firm's cooking apparatus, ranges, firegrates, baths, and lavatories, etc., are made; and a subdivision of this foundry is expressly devoted to the manufacture of rainwater and soil pipes, gutters, window-frames, skylights, etc. The company is so fortunate as to possess a great number of carvings designed in the eighteenth century by those fine artists William and Henry Haworth, who were pupils at the Royal Academy during the presidency of Sir Joshua Reynolds, and these are not only introduced with artistic effect in many of the firm's productions, but doubtless have set a high standard for the emulation of later designers. The souvenir, which is daintily illustrated, is, in short, replete with an astonishing variety of interest.

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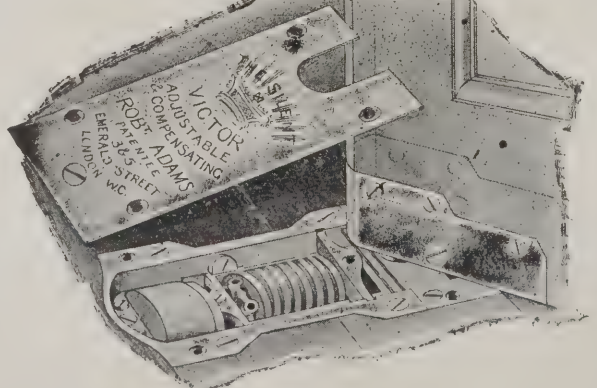

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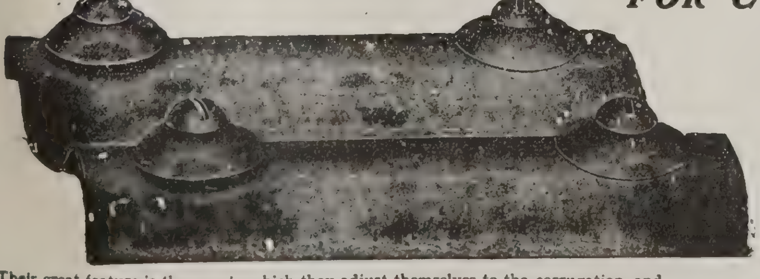

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Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Banbury.—For the erection of a Council School, Grimsbury, Banbury, for the Banbury Education Committee. Talbot - Bronwn and Fisher, F F.R.I.B.A., Architects, Wellingborough. Quantities by Batstone Bros., Cannon Street, London.

Williams and Carnall, London	£9,200	4	9
H. Cruse, Lewes	8,225	0	0
G. Orchard and Son, Banbury	7,323	0	0
R. Cosford, Northampton ...	7,298	0	0
C. Hope, Berkswell	7,289	0	0
T. Simms and Son, Oxford ...	7,030	0	0
J. T. Booth and Son, Banbury...	7,000	0	0
T. L. Kingarlee and Sons, Oxford	6,987	0	0
Beardsmore and West, Northampton	6,974	0	0
E. J. Johnson and Son, Leicester	6,947	0	0
F. H. Smith, Birmingham ...	6,820	0	0
T. Hickman, Market Har. ...	6,747	0	0
Hacksley Bros., Wellingboro'	6,699	0	0
J. S. Kimbarlay, Banbury ...	6,627	0	0
Goodman and Murkett, Wellingborough	6,600	0	0
R. Marriott, Rushden	6,582	0	0
G. Henson and Son, Wellingboro'	6,464	0	0
Thos. Higgs,* Northampton	6,098	0	0

* Accepted.

Barnard Castle.—For erecting a new auction mart. Mr. F. H. Livesay, architect, Newgate Street, Bishop Auckland.

W. Hudson	£1,228	12	11
J. N. Walker	1,181	10	8
R. Wilson	1,181	8	4
J. Kyle and Sons,* Barnard Castle	1,174	0	0

* Accepted.

Bedford.—For extension to the Shire Hall, Bedford. Messrs. H. Percy Adams and C. Holden, and W. H. Leete, architects:—

Beardsmore and West, Northampton	£8,783
Foster and Dicksee, Ltd., Rugby ...	£8,444
J. Longley and Co., Crawley, Sussex	8,388
A. J. Dawes	8,185
C. Miskin and Sons, St. Albans ...	8,148
J. Corby and Son	8,089
Warton and Dunstall	8,085
W. J. Fryer and Co., Paddington, W.	8,000
S. Roberts, Ltd., Plymouth	7,823
Kerridge and Shaw, Cambridge ...	7,745
H. Willcock and Co., Wolverhampton	7,685
S. Foster, Kempson	7,667
Hacksley Bros., Wellingborough ...	7,589
T. Higgs, Northampton	7,499
E. Brown and Son, Ltd., Wellingborough	7,450
T. Hickman, Market Harborough ...	7,399
E. Archer and Sons,* Northampton	7,396

Rest of Bedford.
*Accepted.

Belvedere.—For the erection of a porter's lodge at Erith Sanatorium, Little Heath, Belvedere, for the Erith Urban District Council:—

L. Lown and Co., Holloway, N.	£428	18	11
Pasterfield and English	398	0	0
W. Shurmur and Sons, Ltd., Clapton	396	0	6
J. T. Jarvis and Sons	395	0	0
Jones and Andrews, Beckenham	375	0	0
F. Finnecy	370	0	0
H. E. Chandler, Belvedere ...	367	0	0
W. H. Hyde and Co., Upper Norwood	359	0	0
G. H. Gunning and Sons	358	0	0
E. Pavitt and Sons, Purfleet ...	355	0	0
Friday and Ling*	340	0	0

Rest of Erith.
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Bovey Tracey (Devon).—For erection of a farmhouse at Elsford, Bovey Tracey, for Messrs. Daniel Wrayford and F. Amery; also for additions to Riley Farm House, Hennock, for Mr. James Bawdon. Mr. Samuel Segar, F.I.A.S., architect, 24 and 26, Union Street, Newton Abbot:—

Farm House, Bovey Tracey.

J. Winsor, Bovey Tracey ...	£594	15	0
Wills Bros. and B. Parker, Moretonhampstead	585	0	0
F. J. Badcock,* Ashburton ..	521	0	0

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Wills Bros. and B. Parker ...	£138	0	0
J. Winsor	135	0	0
F. J. Badcock*	117	10	0

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(*Tenders continued on page viii.*)

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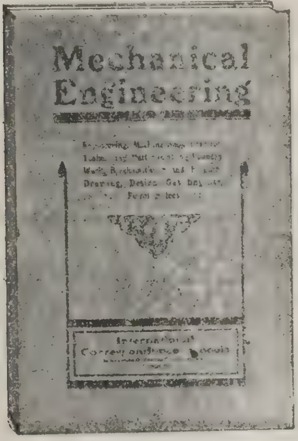

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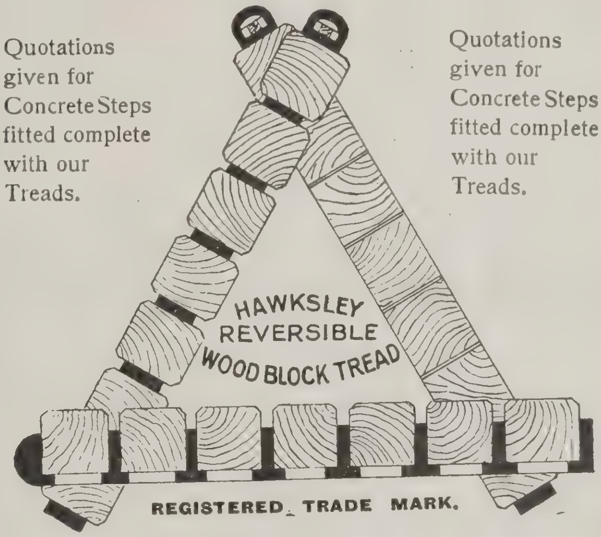

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(Tenders continued from page vi.)

Blackrock (Ireland).—Accepted for laying water mains and sewers, construction of roads, footpaths, etc., for the Urban District Council.

Hull and Co., Ringsend, £1,150.

Blackrock (Ireland).—Accepted for erection of three blocks of dwellings, for the Urban District Council.

L. Monks, Kingstown, £12,364 6s. 2d.

Blundeston, near Lowestoft.—For erection of a Wesleyan Chapel, Blundeston, near Lowestoft. Mr. R. Scott Cockrill, A.R.I.B.A., architect, Crossley House, London Road, Lowestoft:—

Spencer, Santo and Co., Felixstowe	£1,000	0	0
C. Roper, Ipswich	948	0	0
C. R. Cole	936	0	0
R. C. Todd	920	0	0
W. Wynes, Loddon	875	6	3
Carter and Wright, Great Yarmouth	849	0	0
W. J. Croft	847	10	0
F. Button and Son	825	10	0
Moore and Sons, Great Yarmouth	811	0	0
Hawes and Sons	794	0	0
J. Balls, Gt. Yarmouth	776	12	0
T. H. Yelf	775	0	0
B. G. Beech, Great Yarmouth	765	0	0
A. G. Beckett,* Victoria Road, Oulton Broad	757	12	6
H. Pearman, Blundeston	750	0	0

Rest of Lowestoft.
*Accepted.

Bournemouth.—For erection of branch library at Boscombe, for the Public Libraries Committee of the Bournemouth Town Council. Mr. C. T. Miles, F.R.I.B.A., architect, Observer Chambers, Bournemouth. Quantities by the architect:—

J. Mitchell	£4,158	10	3
W. Hoare and Sons ...	3,952	0	0
S. Whitaker	3,921	0	0
F. Hoare and Sons	3,849	0	0
W. Jones and Sons	3,800	0	0
A. W. Bowman	3,742	18	0
Miller and Sons	3,726	0	0
A. J. Long	3,655	0	0
Jones and Seward	3,575	0	0
McWilliam and Son	3,573	0	0
Jenkins and Sons	3,553	0	0
J. and W. Hayward	3,487	0	0
F. A. Grigg*	3,455	17	0

All of Bournemouth.
*Accepted.

Darlington.—For pulling down premises, Tubwell Row, and erecting two new shops, dwelling-house, and warehouses at rear, for the Trustees of C. North Coates. Messrs. J. J. Taylor and Minor, architects, Post Office Chambers, Darlington. Quantities by Messrs. J. P. Allen and Partners, Newcastle:—

Stairmand and Son	£1,446	10	0
J. J. Airey	1,211	5	2
J. Guthrie and Son	1,179	13	6
Earnshaw	1,163	9	2
T. Rodgers	1,157	9	5
Blackett and Son	1,116	0	0
Mackenzie Bros.*	1,115	10	0
T. Boyd	1,107	18	3

Architect's estimate, £1,100.

All of Darlington.

*Accepted.

Denton, near Gravesend.—For erection of a new Council school, to accommodate 250 children, at Denton, near Gravesend, Kent, for the Kent Education Committee. Mr. Wilfrid H. Robinson, M.S.A., architect:—

S. Wise, Hythe	£3,898
T. W. Hooker, Gravesend	3,841
S. Edwards, Wimbledon	3,800
H. W. Martin, Gravesend	3,598
Brown Bros., Grays	3,582
Spencer, Santo and Co., Ltd., Kensington High Street, W.... ...	3,538
T. Crossley and Son, Bromley, Kent	3,416
West Bros., Rochester	3,382
A. S. Ingleton, Herne Bay	3,382
J. Podger and Sons, Bromley ...	3,358
L. Seager, Sittingbourne	3,350
Multon and Wallis, Gravesend ...	3,333
W. F. Blay, Ltd., Dartford	3,299
F. and G. Foster, Norwood Junction	3,296
Jones and Andrews, Beckenham ...	3,265
G. Gates and Sons, Frindsbury, Rochester	3,250
W. H. Archer and Son, Gravesend ...	3,243
R. E. Nightingale, Lambeth	3,238
A. H. Fryd, Southend-on-Sea ...	3,232
C. E. Skinner, Chatham	3,217
F. Webster and Son, East Dulwich, S.E.	3,199
E. Bishop and Sons, Sittingbourne ...	3,192
E. Pavitt and Sons, Aveley, Essex ...	3,160
Friday and Ling, Erith	3,150
A. E. Tong, Gravesend	3,073
G. Baker and Son,* Strood	3,059

*Recommended for acceptance.

Devonport.—For the interior decoration of St. John the Baptist Church, Devonport. Mr. E. M. Leest, architect, 14, St. Aubyn Street, Devonport:—

J. Prowse, 200, Union Street, Plymouth	£363	0	0
Harris and Sons, 70, George Street, Plymouth	289	10	0
Earl and Son, 11, Marlborough Street, Devonport	224	15	0
Pitcher and Son,* 6, Marlborough Street, Devonport ...	204	17	0
A. J. Osborne, 20, York Street, Plymouth	192	19	6

*Accepted.

Drighlington (near Bradford, Yorks.).—For erection of the Tempest Constitutional Club, Drighlington. Mr. Louis Ambler, F.R.I.B.A., architect, Temple Chambers, Temple Avenue, London. Accepted tenders:—

I. and D. Thornton, Drighlington, near Bradford, masons, etc....	£520	0	0
T. Nelson and Son, Bradford, slaters	63	18	0
H. Waterhouse and Sons, Dudley Hill, Bradford, joiners ...	293	0	0
A. Cooper, Drighlington, smith, gasfitter, plumber and glazier	201	10	0
J. Iredale and Son, Birstall, near Leeds, plasterers	24	10	0
T. Batty, Drighlington, painter	18	0	0

Frodsham.—Accepted for the erection of a new house, Lime Avenue, Frodsham, for Mr. W. D. Ringrose. Mr. Samuel Davies, M.S.A., architect, Frodsham.

John Littler, Frodsham, £580.

London, N.E.—Accepted for painting, repairs, to guttering, pointing of brickwork, and other work at their workhouse, and infirmary, for the Guardians of St. Leonard, Shoreditch.

C. and D. E. Dearing and Son, Clarence Lane, Islington, £1,279.

London, W.C.—For forming new lower fronts and window enclosures at the British Medical Association premises, Strand, for Messrs. Dunn and Co. Mr. Edmund A. Fermaud, 59, Denbigh Street, Westminster, architect:—

Arnold and Sansum	£637	10	0
G. Sprukley and Co.	598	0	0
S. Jones and Co.	571	6	0
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Hibberd Bros.*	544	12	0

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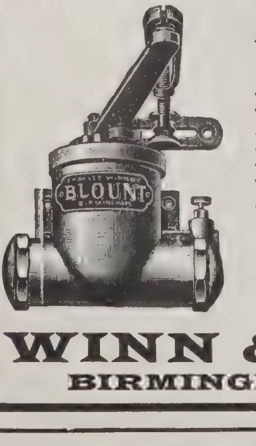

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House Inspection. Mr. T. C. Horsfall, whose utterances on housing questions always command the utmost respect, for he speaks with authority and not as the Scribes, thinks that Clause 30 of the Housing and Town Planning Bill ought to have been retained—the clause that provided for the systematic inspection of small dwellings. He points out that such a system of inspection has operated so successfully in many parts of Prussia as to induce the Prussian Government to insert clauses in their last Housing Bill to make inspection compulsory in all parts of the Kingdom. Mr. Horsfall says that the faults and defects found wherever there is inspection may be divided into three principal classes: serious faults in the structure or position of dwellings; minor defects, such as defective roofs, walls—easily removable; insufficiency of light and air, due to the neglect of the owners or their agents; and faults, such as dirtiness, dampness, lack of air, due to the neglect of tenants. "Now," he argues, "it is a well-ascertained fact that these faults in dwellings have results which have to be paid for by the payers of rates and taxes. The faults are known to be causing a large amount of tuberculosis and other diseases, the sufferers from which have to be maintained at the public expense, and they are causing in other ways a great deal of poverty, inefficiency, and crime, which cause us all enormous expense. If systematic inspection of all small dwellings can lead to the removal of the faults, it will certainly be cheaper in the long run for us all to have it than to refuse to bear the cost of discovering what is wrong in all small dwellings and of getting all that can be put right, put right as soon as possible. German experience shows that systematic inspection is causing the removal of a very large proportion of the causes of disease, and that its cost is not high." Mr. Horsfall's logic is irrefutable, but he leaves out of the account the most vital element. It is not a question of cost, as Mr. Horsfall seems to think. Mr. Burns, it is true, made much of that aspect of the case; but we suspect that he had at the back of his head a shrewd knowledge of the real difficulty of the situation, but did not like to mention it because its expression would have sounded rather sentimental. It is merely this—that the German sentiment—more especially the Prussian variety—is vastly different from our own. The Prussians are accustomed by traditional usage to being inspected from top to toe, inside and out, and with them any sort of poor creature in a uniform is a demigod, whose frown it is sacrilege to brave. On the other hand, the free and bold English spirit tolerates any form of inspection very badly. Anything in the nature of a domiciliary visit is heartily detested and bitterly resented. Hence, Clause 30, as we ventured to observe before it came up for judgment, was foredoomed to failure. In our view there was nothing the matter with it except that it was unpopular, and there was an end to it.

The Combined Drainage Conundrum. The numerous questions addressed to us with reference to combined drainage, show that the subject is in sore and urgent need of simplification. "When is a drain not a drain?" is a sort of conundrum to which the plain man is apt to answer in despair, "I give it up." The element of despair is observable in a report to hand of a debate on the subject by the Dublin Corporation. Having regard to the great number of combined drains in the city "injurious to health," the Public Health Committee were asked to report as to the Corporation's position under the existing law, and they have been told that "the liability involved might amount to as much as £100,000 in a few years." They think that this estimate is exaggerated, but their report was thought to reach the opposite extreme of excessive optimism, and was referred back. It has always seemed to us that the worries and responsibilities thrown upon private owners, architects, and builders, to say nothing of municipal officials, by the indeterminate state of the law as to drainage, are too heavy for them to bear. The measure of relief that has been accorded them within recent years has been quite insufficient. We are very well aware of the difficulties that stand in the way of drastic reform; the chief being that indicated in the Dublin report. The cost to the community would be enormous. But apparently it would be very well worth while. To determine at once and for ever the vexed question of drain or sewer, and to extinguish at a stroke the anomalies arising from joint or separate ownership, is not impossible. It is only impracticable because of the heavy burdens already borne by the long-suffering ratepayer, who would kick vigorously, as he is doing at Dublin, if asked to take over the responsibility for the innumerable drains that are still repairable by private owners. If, it is sometimes argued, the private owner were not liable to repair the drains he constructs, he would construct them without the least regard for their durability, because the expense of keeping them in repair would fall upon the community. But the incidence of the burden would be an additional reason for more adequate official supervision of the work. It is the old drains that cause nearly all the bother. If all the antiquated and inefficient systems still in operation in various parts of the Kingdom were brought up even to the minimum standard of efficiency exacted by modern sanitary science, the expenditure on the work would probably amount to more millions than the estimated cost of eight new Dreadnoughts. Yet it is work that ought to be done if the death-rate from zymotic diseases is to be still further diminished, and if the constantly recurring and harassing questions of responsibility are to be set at rest.

The Picturesque and the Prim. The time is coming, and now is, when the tour of any latter-day Dr. Syntax in search of the picturesque must be barren and fruitless; unless the ideas of picturesqueness happen to change with the times. There are many by whom this quality never will be missed, or will be missed with a sense of satisfaction rather than of sorrow. The hard-headed economist distrusts, if he does not detest it. Picturesqueness is apt to be inconvenient and insanitary. The thatch of the lovely country cottage is loaded with loathsome disease germs; its creeper-covered walls are damp and noisome, its windlassed well is the breeding-place of zymotic diseases, and so forth. Recurring instances of the truth of this formidable indictment have led to the evolution of a cottage that appeals to the mind as well as to the eye, because it is known to be wholesome and commodious, as well as seen to be comely of form. This is surely an instance of the revision of one's ideas upon what is picturesque. It has set up a more robust standard of judgment, in which healthy sentiment supersedes sickly sentimentality. Even so when, as legislation threatens, all the roads are levelled and widened and straightened, and when all the winding lanes and picturesque corners have disappeared in the process, we may perhaps come to the point of rejoicing in a "superior consideration." There will be fewer motor accidents, even if Mr. Lloyd George fails to materialise his heroic scheme of running straight and level motor roads through our prettiest bits of landscape at the cost (estimated by an expert figure-fiend) of £8,000 a mile; for the more conservative of the town-planners will be pretty hard put to it to prevent the more prosaic from effecting the elimination of picturesque but awkward corners, and the reduction of everything to a Dutch dead-level of flatness, with glazed-tile dolls' houses to match. The utilitarian faddists will not have it that convenience and cleanliness can be bought too dear, or can be pushed to an absurd extreme, and their zeal will have to be curbed if the country is to retain its old-world charm. The avoidance of an excess of Dutch primness will be one of the principal problems of practical town planning; and it is certainly made more difficult by certain provisions of the Development Bill, which has now been sent to Grand Committee. Well might Lord Rosebery say that "the destinies of England are in the melting pot."

Shields and Chivalry. Whatever may be the shortcomings of the typical rural district councillor, he is seldom or never deficient in dogged pluck. A mild example of this eminently British quality is thus laconically recorded in a South Shields newspaper report of a recent meeting of the R.D.C.: "Some discussion ensued about the right of Mr. Johnson to board up a back lane in the rear of his premises. Mr. Laidler said they would have to instruct their surveyor to knock it down. Mr. Johnson declared that it would not be knocked down if he was about. It was decided to adjourn the matter for two months." That was a debate in the manner beloved of Sir Conan Doyle's chivalrous old Sir Nigel: he loved to "debate with sword or lance." Mr. Johnson, like his illustrious namesake, the Great Cham of Literature, and like the even more eminent and not less formidable "rare Ben," is evidently of sturdy and indomitable character—"a tall man of his hands." It was therefore prudent of the Council not to thwart him in his challenging mood. In the course of two months the general temperature is likely to become much cooler; or the Equinoctial gales may providentially spare the surveyor the formidable task of bearding the intrepid Mr. Johnson in his own barricaded back-yard. But, on the other hand, this prolonged armistice may give the stalwart defender abundant opportunities for laying in provisions and armaments, and strengthening his fortifications, in which case the surveyor might be well advised to go into strict training for the Homeric encounter, and to take a few lessons in the gentle art of ju-jitsu. Then, by doughty deeds, he may secure increased respect for his prowess in levelling, and the fact that Mr. Johnson is "about" shall not make him afraid.

See Naples and—Dirt. The building trade in Naples at the present moment may be considered brisk. A few large buildings are being erected at the westward end of the town, and in addition several of the largest blocks nearer the centre of the city are being modernised. This treatment has extended to the outward appearance of the buildings. The coloured stucco work has been removed and the brickwork cased in with stone. The design of window and door openings is more in accordance with modern ideas, perhaps not a great improvement, for in conjunction with the latest treatment of window and shop fittings much of the local character is lost. In one respect the town still maintains its pre-eminence; it still remains one of the dirtiest and noisiest places that can be conceived. Every street corner forms a local dustbin, with an overflow into the road, or pavement where it exists. The Neapolitans, if they could only be persuaded to see the value of such a course, would do well to import a strong English town council and municipal officials. Five years of resolute management would be necessary to give an appearance of cleanliness, but it would take generations to make it permanent.

Memorials of Greater London. The issue of another important publication by the Committee for the Survey of the Memorials of Greater London affords a legitimate opportunity for again drawing attention to the excellent work that is being quietly and unobtrusively accomplished by this exceedingly useful organisation. The object of the Committee could hardly be better or more succinctly expressed than it is in the words of a circular that has been sent to us: "The object of the Commitee has been to take up certain areas in London, and in them to register and record with drawings, photographs, and other records, whatever may be deemed to be of historic or aesthetic interest. The work is not confined to buildings only; any object of local life or custom that may have a definite external embodiment, or any interesting piece of handicraft, even if it be but a signboard or a wrought-iron gate, comes within the Committee's survey. The aim is to draw attention to these things. If they are in private hands, to get the owner's consent towards their registration; if under the guardianship of any representative public or semi-public authority, to encourage their maintenance, for public purposes, as national trusts." The modesty of tone observable in this statement is maintained in the Committee's operations, and is as a refreshment to the soul that has been too often vexed to wonderment whether other and much more aggressive bodies, professing similar aims, do not care rather for the joy of combat than for the object of the contention. The Committee can be very firm on occasion, but it has never developed what, for want of a better word, may be called the cantankerousness that excites opposition rather than effects conversion. It does its spiriting very gently, and in this way its energetic and accomplished band of active workers have achieved tangible and splendid results. It has compiled a very large and beautiful collection of drawings, photographs, sketches, measured work, etc., to the number of about 2,500 items. Eleven monographs on work deserving special attention have been published, the latest of which, "The Survey of Chelsea," is perhaps the most interesting of the very fascinating series. We hope to have an early opportunity of noticing it at greater length. Readers of "The Architectural Review," in which, month by month, the Committee's current work is illustrated, have enjoyed a foretaste of the æsthetic interest of this volume, and will be glad to have the records in collected form. The price of the volume is 25s., but membership entitles the subscriber to all the Committee's publications for the year—a rich return for his guinea. The secretary is Mr. Percy Lovell, B.A., A.R.I.B.A., 23, Old Queen Street, Westminster, and on the lists of honorary and active members we notice the names of several well-known architects. We should like to see more; for it is perfectly obvious that the interest of the Committee is largely architectural; otherwise this note would not have been written.

THE CITY OF NOBLE TOWERS.

By A. K. Carr.

A City of Towers, rather than a "City of Spires"—a City of Churches even more than a City of Colleges: a city of gardens, of venerable buildings, stately avenues, and velvet lawns; of grey stone walls festooned with creepers — a symphony in grey and green. Such is the general impression of Oxford, seen on a summer day in vacation. Antiquity is its dominant note: tradition clings to it as its lovely creepers cling to its ancient walls. A classic calm pervades the atmosphere—a serene dignity, far removed from twentieth century unrest. Here is a city where the spirit of commercialism is made to play a subordinate part: where the material is subjugated to the ideal. Oxford is a City of Ideals; and many of its ideals are embodied and expressed in stone. In the presence of its hoary buildings, instinct with the spirit of the dead centuries, the trivialities and the sordidness of modern everyday life fall away, and leave us face to face with the Spirit of the Past. Tradition lays its hand upon us, and the present fades into insignificance. In the City of Ideals we become idealists.

To the lover of architecture, especially of ecclesiastical architecture, the attractions of Oxford are, of course, inexhaustible. It represents the styles and methods of nearly a thousand years, from the Saxon tower of St. Michael-at-the-North-Gate to the modern Church of St. Barnabas—the only church in Oxford in the Italian style, rearing its campanile beside a railway line—in "Jericho!"

The antiquity of St. Michael's tower makes it, for some of us, the most fascinating of all Oxford's buildings. Supposed to have been built by Robert D'Oily in the reign of William the Conqueror, but probably only restored by him, and therefore of much earlier date, it is uncompromisingly severe in its simplicity. It was designed more for utility than for ornament, having been erected as a fortress tower on the north wall of the city, though now, owing to the great expansion of Oxford towards the north, it occupies a position south of the centre of the town. The church attached to it is evidently of much later date than the tower, which is by far the oldest building in Oxford, and one of the oldest in the country. Its fortress character is instantly apparent—a sturdy pillar of rough grey stone, with quaint little arrow slits, situate high up in the tower, while the lower part of its grim face is unrelieved by door or window. The absence of buttresses is a notable feature, testifying to the antiquity of the work. The tower shows no outward signs of decay, though it has withstood the ravages of time and tempest for possibly a round thousand of years.

Close by is the Church of St. Mary Magdalene, the original of which was also built by Robert D'Oily; but little or nothing of the original now remains. The church has the square Norman tower common to most Oxford churches, but compared with the grim severity of St. Michael's it is quite modern and ornate, with its open parapet, ornamental buttresses, and Decorated windows. The tower was, in fact, rebuilt in the 16th century, the older part of the building dating back to the reign of Edward II. The church, curiously situated on a kind of island in the middle of the road, owes to this fact its somewhat peculiar plan, for, being bounded east and west by the roadway, extension in either of these directions has been impossible, and enlargement has had to be effected by the addition of north and south aisles. This peculiarity obtained for it the nickname of "The Archipelago"

Opposite the north door of St. Mary's is the graceful Martyrs' Memorial, in the style of the Queen Eleanor crosses erected by Edward I. Facing the Memorial is the picturesque and creeper-covered west front of Balliol College, extending northward till it adjoins the equally picturesque St. John's College, which is half hidden behind a splendid row of elm trees. Of all the lovely gardens in Oxford, St. John's College garden is perhaps the loveliest. Lying far back from the road, from which it is separated by two quadrangles, the garden on a summer afternoon presents a spectacle of ideal peace and loveliness, with its green velvet lawns bathed in sunshine, its flower borders aglow with colour, its venerable trees, its rockery, and, on its western side, the lovely garden front of the college, with its oriel windows looking out through a veil of greenery.

South of St. Michael's is the interesting tower of St. Martin Carfax. This tower occupies the site of the oldest parish church in Oxford of which any record can be traced. Of the main building no vestige remains, but the tower, supposed to have been built in the reign of Edward III., but showing traces of a much earlier date, has been preserved as a clock tower, and is one of the most conspicuous objects in Oxford, standing in the heart of the town, at the junction of the four main thoroughfares. The stranger in Oxford, taking it for a church, looks vainly for the entrance, and is mystified to find none. There is something impressive about this solitary tower standing among the shops in the busiest part of the town, preserved, not for its utility, but for its picturesqueness and historic interest. In the church of which this tower once formed a part, Shakespeare is said to have stood sponsor to Sir William Davenant, who vaingloriously claimed a closer relationship with "Sweet Will."

Further south, its grounds bordering on the river, Christ Church College, the chapel of which is also the Cathedral Church, is one of the smallest cathedrals in England, but nevertheless one of the most interesting, both historically and architecturally. It occupies the site of a convent founded by St. Frideswide, who died in 740. At the east end of the north aisle are the remains of a Saxon arch, and close by is a part of the shrine of St. Frideswide. A fascinating feature is the lovely fan-tracery of the roof of the choir. The prevailing style is Norman, and in the chapter-house is a splendid specimen of a Norman doorway; but much of the work is Early English, the church being very interestingly representative of the transition. Its fine Early English tower and spire give the city half its character, but the other side of the great quad, the famous Tom Tower, built by Sir Christopher Wren in 1682, does not now look like a mere modern upstart.

The High Street, thanks to the town-planing authority vested in the University, is an imposing thoroughfare, lined with noble buildings. It is dominated by the spire of St. Mary's Church, which, with its fine facade surmounted by a row of pinnacles, its beautiful porch supported by twisted columns and crowned with a figure of the Virgin and Child, and its magnificent Decorated spire, is, for most people, one of the finest specimens of architecture in Oxford. The original building is one of the four Oxford churches mentioned in Domesday Book, the other four being St. Michael's at the North Gate, St. Peter's in the East, and St. Martin Carfax—but the greater part of the present church was built in the 13th century, in the Decorated style then prevalent; the spire, with its cluster of turrets and pinnacles at the base, having been added some years after the Early English tower was built. St. Mary's, with its profusion of ornament, is the antithesis of St. Michael's, with its aggressively utilitarian aspect. Perhaps the loveliest feature of St. Mary's is its unique porch with spiral columns, the beauty of which is enhanced in summer by a curtain of creeper. The figure of the Virgin and Child over the porch are of the few "graven images" which escaped the general destruction at the Reformation. Close by is the graceful spire of All Saints' Church, a comparatively modern (early 18th century) building in the Classic style, occupying the site of a very ancient church of the same name. More interesting, from an archæological point of view, is "Ye Ancient Church of St. Peter-in-the-East," situate in a lane just off the High Street. This is one of the churches mentioned in Domesday Book, but the greater part of the present building was erected in the 12th century. Under the chancel there is an interesting crypt, of earlier date than the church above it. There is also a splendid Norman doorway in the south wall of the church. The lane in which this church stands is itself very interesting, skirting as it does the old eastern wall of the city, and spanned at one point by a beautiful Norman arch.

Between the High Street and Broad Street lies an extremely interesting group of buildings forming the heart and nucleus of classic Oxford. This group includes the Sheldonian Theatre, with its octagonal cupola commanding a beautiful view of the city, the Bodleian Library, the Divinity School (said to be the most beautiful interior in Oxford), and the Tower of Five Orders, in which the Tuscan, Doric, Ionic, Corinthian and Composite columns are superimposed. The High Street culminates in the glory of Oxford—Magdalen College, with its incomparable tower, surmounted by four pinnacles, standing on the bank of the river like the guardian spirit of the town. The tallest, the most conspicuous, and the most perfect of all Oxford's towers, it is a landmark for miles around, rising high above all the other buildings, overlooking the city like a fair sentinel. In conjunction with the river and Magdalen Bridge, it makes an exquisite picture.

Two other extremely interesting colleges are the two which present perhaps the greatest contrast—New College and Keble College; the former almost the oldest, the latter almost the newest, college in Oxford. New College is very, very old. Its most interesting feature is the fragment of the old city wall forming the boundary of the college garden on its north and east sides, the College being built in an angle of the wall. Very hoary and venerable is this old wall, with its platforms where the sentinels used to keep watch, approached by steps hewn out in the thickness of the wall. At one corner of the wall stands the bell tower, at some little distance from the chapel itself. This tower is of a semi-military character, almost as severe in design as that of St. Michael-at-the-North-Gate, of which it is a 14th century counterpart. The chapel is perfect in proportion and simple in design, all over-elaboration having been scrupulously avoided. In the ante-chapel is the famous sepia window by Sir Joshua Reynolds, perhaps the most beautiful window in Oxford.

Very different in kind, though scarcely less in degree, is the attraction of Keble College. Here the charm of antiquity and tradition is altogether wanting. The college is in fact almost glaringly new, yet with a beauty of its own which may challenge comparison with any other college in Oxford. Erected in the 19th century, it marks a departure from the traditional style of architecture in Oxford, being the only college built of brick. The chapel is of extraordinary height. Its walls covered with brilliant mosaics, its windows filled with stained glass, it is full of light and colour.

Just beyond the railway station, in the extreme S.W. corner of the city, and hidden behind a huge marmalade factory, is the interesting little old church of St. Thomas-the-Martyr. Built in the 12th century, it is a typical Norman church, with its squat square tower of rough grey stone, and its general air of solidity—a church to delight the soul of the antiquarian. Standing in its quiet churchyard, one might almost fancy oneself back in the days of King Stephen.

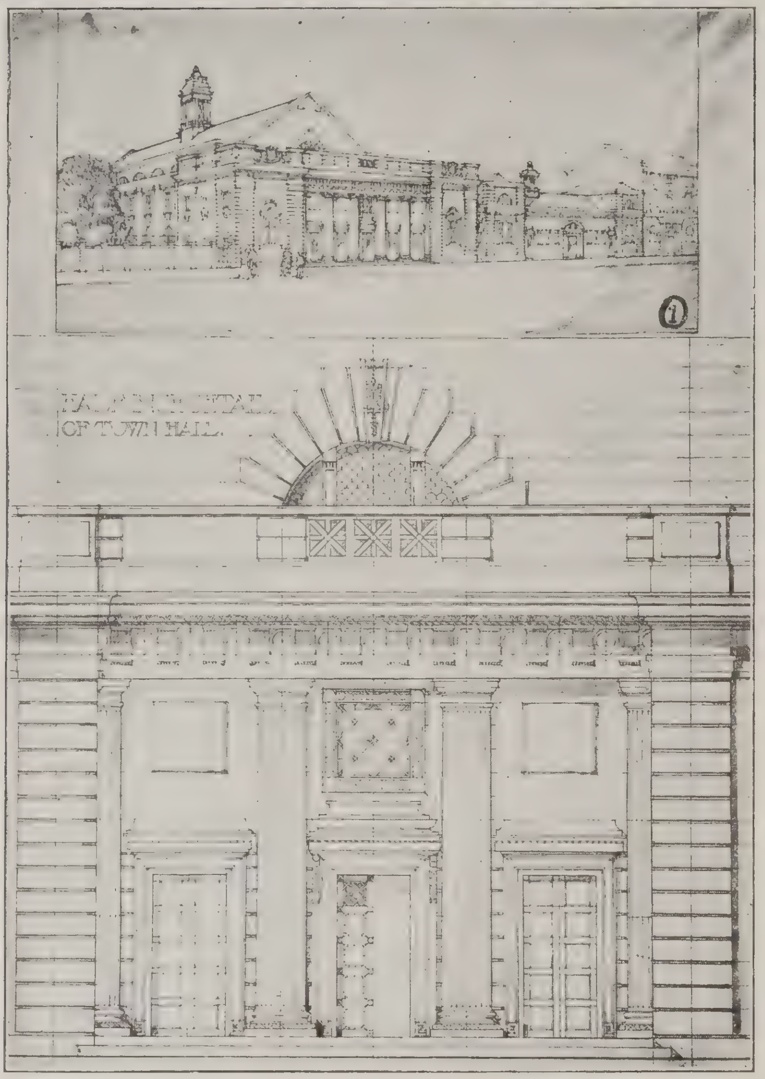
From St. Thomas-the-Martyr to St. Barnabas—from the reign of Stephen to the reign of Victoria—is a far cry; from St. Barnabas to the Saxon tower of St. Michael-at-the-North-Gate, a still further one; and as the mind goes back over the centuries to those remote Saxon times, one realises that in Oxford we have an epitome of the great events of English history, and of the history of English architecture, since the days when the inhabitants of the city watched the tower of St. Michael rising stone by stone above the northern gate of their city.

STOKE-ON-TRENT MUNICIPAL BUILDINGS EXTENSION.

Clause 3 of the conditions of this competition reads: "It is the intention of the Council to accept the award of the assessor, and to entrust the carrying-out of the work to the author of the design which he may select, unless a sufficient reason exists to the contrary. The Council does not, however, bind itself to carry out any one of the designs submitted." Then Clause 4 reads: "Subject to Clause 3, the author of the design placed first will receive the commission for carrying out the work. The authors of the designs placed second and third will receive respectively the sum of £100 and £50;" while Clause 6 reads: "In the event of the Council's giving no instructions to proceed with the work within twelve months of the award, the selected architect will be paid the sum of £200, which sum will merge into the commission of five per cent. if and when the buildings are carried out; or if, for any reason, the scheme should be entirely abandoned or not proceeded with within five years of the award, he will be paid the sum equal to one and a quarter per cent. (less the above-mentioned £200) upon £25,000, the estimated cost of the building."

The Council, notwithstanding the award of the assessor, Mr. Leonard Stokes, F.R.I.B.A., have, as stated in this Jorunal a fortnight ago, only allowed a premium to the competitor placed second, finding "a sufficient reason" for their action ready to hand in the fact that the building cannot possibly be erected for the money specified. The uncertain nature of the subsoil involving the carrying down of the foundations to at least 10ft. below the present surface of the ground, and the extent of the accommodation required, make the sum that is available (£25,000, from which £1,000 has to be deducted for an organ) quite inadequate, and we think this should have been obvious to the Council from the first. In any case their treatment of the authors of the design placed first and third is to say the least of it unsatisfactory.

The accommodation required in the extension to the present buildings consisted of a hall capable of seating 3,250 people, including galleries, with cloakrooms and lavatories, etc., for both sexes. The entrances were to be "ample and convenient," and exits capable of emptying the whole of each section of the hall in not more than three minutes were to be provided. It was specially desired that the acoustic properties of the hall should be carefully considered, and the use of columns avoided. The existing main entrance was, if possible, to be utilised as one of the principal entrances to the new hall, and the present staircase so remodelled as to form a more satisfactory approach to the existing assembly room. Cloakrooms, etc., which could be used in connection with this entrance, were to be provided. Space was to be allowed in the hall for an organ, and sufficient accommodation for the necessary machinery. A platform, capable of extension by movable portions, both in front and as regards the tiers for chorus, was required to be shown, and two adequately fitted dressing-rooms for artists as well as two for chorus, were to be provided. A new room was required in direct communication with the present assembly room, and of about one-third its area. For the purpose of serving banquets in this room or in the existing assembly room off it, a properly equipped kitchen, with all requisite lifts, etc., and serving-room was specified as necessary, also



STOKE-ON-TRENT MUNICIPAL BUILDINGS EXTENSION. FIRST PREMIATED DESIGN. GARRATT AND SIMISTER, ARCHITECTS.

The best portion of Messrs. Garratt and Simister's elevations is seen in the half-inch detail. It is far in advance, in actual composition and rational restraint, of the bulk of English town-hall designs.

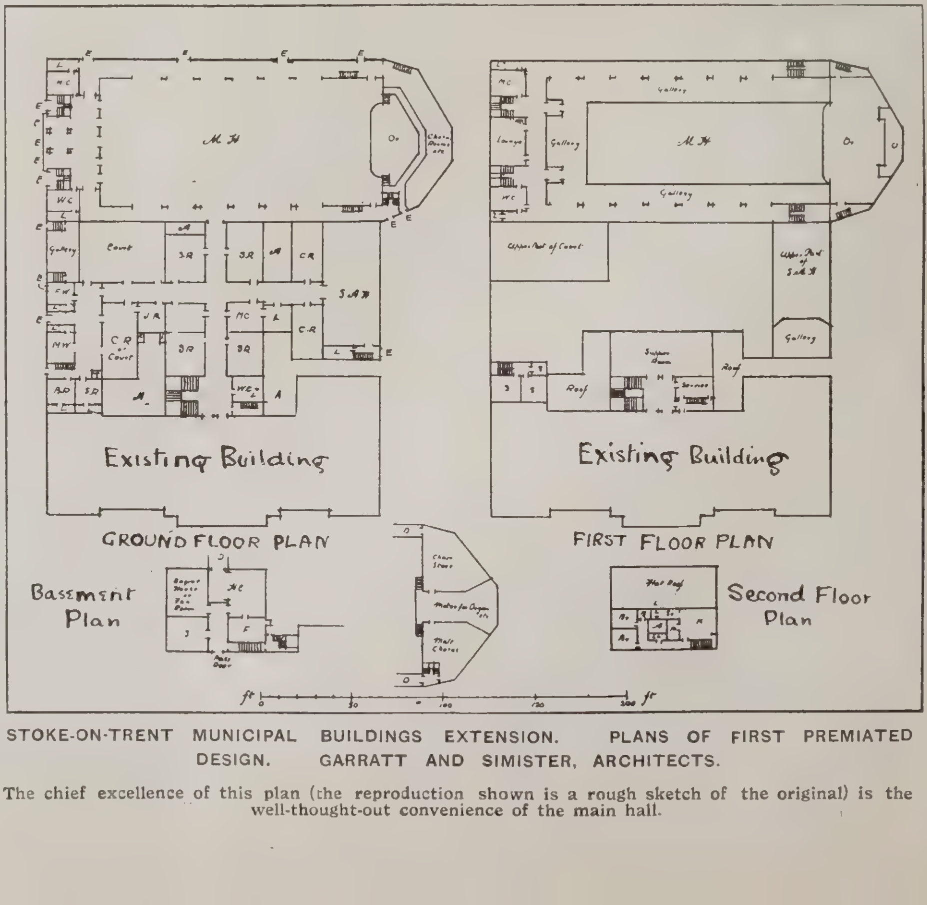
a court room for police and county court purposes, of about 1,800ft. area, with small public gallery, together with judges' retiring room, barristers' retiring room, telephone room, witnesses' room, lavatories, etc.; a committee room of about 800ft. area, in close proximity to the above court room; a small assembly hall, area about 2,000ft.; ante-room and two committee rooms opening off same. (These committee rooms were to have an area of about 500ft. each. A small gallery was to be provided in the assembly hall, with separate entrance, if possible, from outside, and with adjacent lavatory accommodation); four spare rooms of about 500ft. area, within easy reach of the small assembly hall and court room.

A suggestion embodied in the conditions was to the effect that the entrances and approaches to the court room and small assembly hall should be kept as far as possible separate from the main entrances to the large hall, so that the portions of the building could be used at the same time for different purposes without interfering with each other. All buildings at present on the actual extension site could be removed, though it was stated to be desirable that the mortuary and stable buildings should be retained if this could be done without in any way sacrificing the arrangements adopted in competitors' plans. Finally, if in adding to the present building any of the existing office or other accommodation was interfered with, similar accommodation had to be provided either in the old or new building. In or adjoining the latter suitable provision, including store rooms, was to be made for a resident caretaker.

The drawings required included a plan of each floor, two elevations, and at least two sections, all to a scale of 16ft. to 1in.; a detail of a portion of the part toward Tower Street, to a scale of 2ft. to 1in.; a perspective view showing the Tower Street front, in which the actual width of the building was to be fifteen inches. The method of finishing the latter was left to the discretion of the competitor. The elevations were to be in black and white, only without shading, the windows being coloured grey.

In the majority of the schemes submitted one of two types of plan seems to have been followed—either the main hall is placed at the back of the site, with the rest of the accommodation in between it and the old building, an arrangement usually treated as an absolutely new departure, not required to harmonise with the existing block; or the main hall is placed centrally, with the small hall and court balancing on either side. This disposition offers a chance of presenting symmetrical elevations to the side streets.

The first selected design is the work of Messrs. Garratt and Simister, Congreve Street, Birmingham, to whom the sum of £200 would, in the anticipated course of events, have been due as premium. The chief excellence of their plan is undoubtedly the well-thought-out convenience of the main hall, whose only practical defect appears to us to be the inadequacy of the crush hall at the front. But in the disposition of the remainder of the accommodation we do not think the authors are quite so consistently successful. The arrangement generally would bear revision. Thus, however ingeniously the court itself may be placed, it is surely not altogether desirable that the barristers and solicitors should be forced to traverse a long corridor to reach their destination, whilst the provision of separate rooms for male and female witnesses appears to us to be needless, and was not asked for. It is hardly possible also not to take exception to the placing of the small hall along the aqueduct street side of the site, with a small entrance to the gallery only from this street. The main entrance to the small hall is through the main building, by way of a long corridor, which cuts at right angles through the chief axis corridor of the building. Should the large and small assembly halls happen to be used at the same time, the confusion resulting from the two intersecting streams of traffic can be easily imagined.



STOKE-ON-TRENT MUNICIPAL BUILDINGS EXTENSION. PLANS OF FIRST PREMIATED DESIGN. GARRATT AND SIMISTER, ARCHITECTS.

The chief excellence of this plan (the reproduction shown is a rough sketch of the original) is the well-thought-out convenience of the main hall.

Of Messrs. Garratt and Simister's elevations the best portion appears to us to be that of which we reproduce a half-inch detail, and whilst it would not be reasonable to describe it as thoroughly matured work, it is yet far in advance, in actual composition and rational restraint, of the bulk of recent English town hall designs. The central voussoirs of the arch under the gable seem to call for reconsideration, and the almost Dutch key-block scroll is hardly fortunate, though fashionable. The pierced balustrade is also, to our way of thinking, altogether too thin; but it is, after all, a perfect godsend to discover that native designers here and there are waking up to the fact that such motives actually exist.

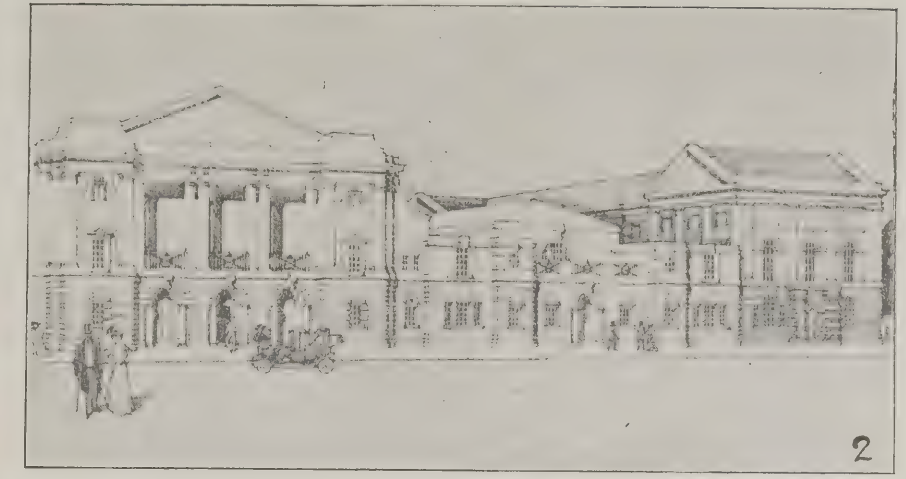
Messrs. Warwick and Hall, 11, South Square, Gray's Inn, London, W.C., placed second by Mr. Stokes, have evolved a plan distinguished by several pleasant features, and with the additional advantage of being more economical than either of the other two premiated schemes. As in the two latter, it will be seen that the main hall is placed parallel to the existing municipal buildings, and at the back of the site. The authors have managed to keep within the line of Aqueduct Street, and thus have effected a considerable saving. However, we think that this advantage over the first selected design is counteracted by the fact that the hall is, on the whole, not so well proportioned and completely thought out as in the latter, though its apsidal end would undoubtedly be a pleasant feature in itself. But in the arrangements of the other parts of the scheme the authors appear to us to be exceptionally fortunate. It will be seen that the small hall balances the court, and the treatment of both shows careful consideration and competent handling. Generally, we think the whole plan to be characterised by refreshing simplicity, and to be a genuinely straightforward and convenient solution of the problem. It is precisely this fact which makes it so difficult to reconcile plan and elevations in this design. We do not like the elevations.

The scheme placed third, that of Mr. W. Haywood, Norwich Union Buildings, Congreve Street, Birmingham, possesses a well-shaped main hall, which suffers somewhat, perhaps, from the large area necessarily occupied by the gallery and orchestra. The general distribution of the rooms appears to us to be good, though a trifle extravagant. The elevations show a decided French influence in parts, and if on that account alone are meritorious. The facade to Tower Street is, in our opinion, infinitely the best, though the return block is, on the whole, a pleasant piece of composition, and shows that the designer has a genuine feeling for mass, and something approaching a real technique in the handling of it.

In the bulk of the other designs submitted, the chief variation in plan from those selected, consists in the placing of the main hall in the centre with the small hall and court flanking it on either side.

A general survey of the exhibits intensifies one's regret that in this country it is so little realised that axial arrangement and balanced symmetrical disposition, together with careful attention to the obtaining of beautiful shapes in halls and rooms, produce not merely planning which is architecturally admirable, but which is also the most satisfactory from the point of view of efficiency, convenience, and economy. The circulation amongst the profession of the recent American and Beaux Arts publication dealing with monumental design would, we feel, do a world of good, and help in some measure at any rate to save us in the future from meriting American scorn of our parochial conception of civic architecture.

A commemorative banquet in connection with the International Correspondence Schools is to be held at the Hotel Cecil on Saturday, September 18th, when Lord Montague of Beaulieu will preside, and many persons of educational, scientific, and business eminence will be among the guests.



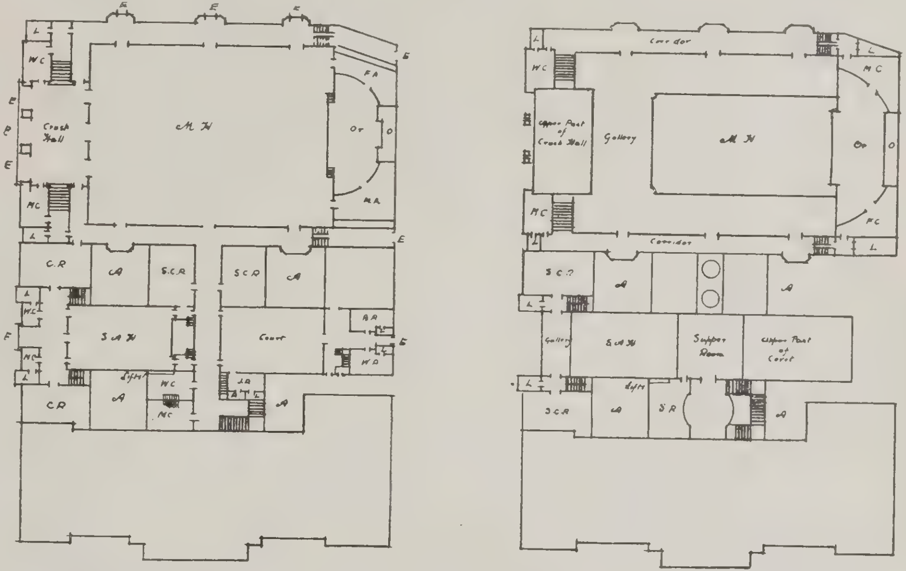
STOKE-ON-TRENT MUNICIPAL BUILDINGS EXTENSION. SECOND PREMIATED DESIGN. WARWICK AND HALL, ARCHITECTS.

GOTHIC GROTESQUES.

Many of the grotesque ornaments in Gothic architecture depict the most ordinary affairs of every-day life. If a man had had cause to beat his wife, he may have taken a secret delight in perpetrating that fact, as at York, or if his wife had beaten him, that circumstance may have furnished the whim which produced the curious grotesques of Sherburne and Beverley Minster. There are many instances where the carvers have cut their initials as ornament, or shown themselves at their trade. Another homely subject often treated is the Ale-wife, who is either doling out imaginary beer to a thirsty carver, or has so provoked his ill-will as to be depicted as borne into the jaws of hell by a grinning demon.

The sculpture in the mediæval churches, Mr. Charles Collens, in "The American Architect" observes, was the picture gallery and library of most of the smaller towns. All that they ever saw of imagery was there, and it is conceivable that such frozen literature may have had its serious as well as its comic side.

The carvers of the Middle Ages all belonged to a guild of Masons, whose history runs far back among the earliest constructions. Thus many grotesques may be careful copies of certain forms which primarily were executed in all seriousness, but which, when copied by a later generation, found their original uncouthness merged into comedy. Such forms were almost in the nature of a Masonic trade-mark, and many of them can be traced back to a Hindoo or Pagan myth. It is for this reason that the earlier churches in England on which Italian and Flemish workmen were employed have grotesques almost identical with those found on the Continent. These early carvings deal largely with mythical characters and the symbols above referred to. Later the grotesque developed into adaptations from nature and curious fancies of all sorts.

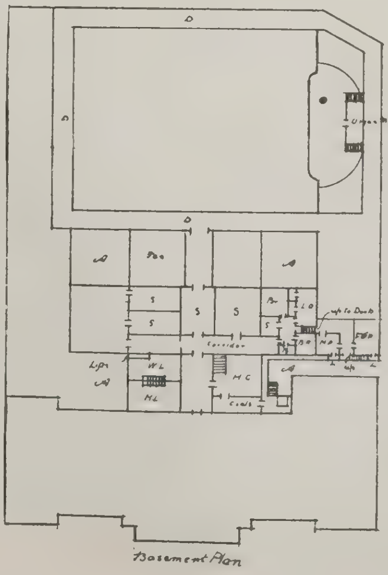


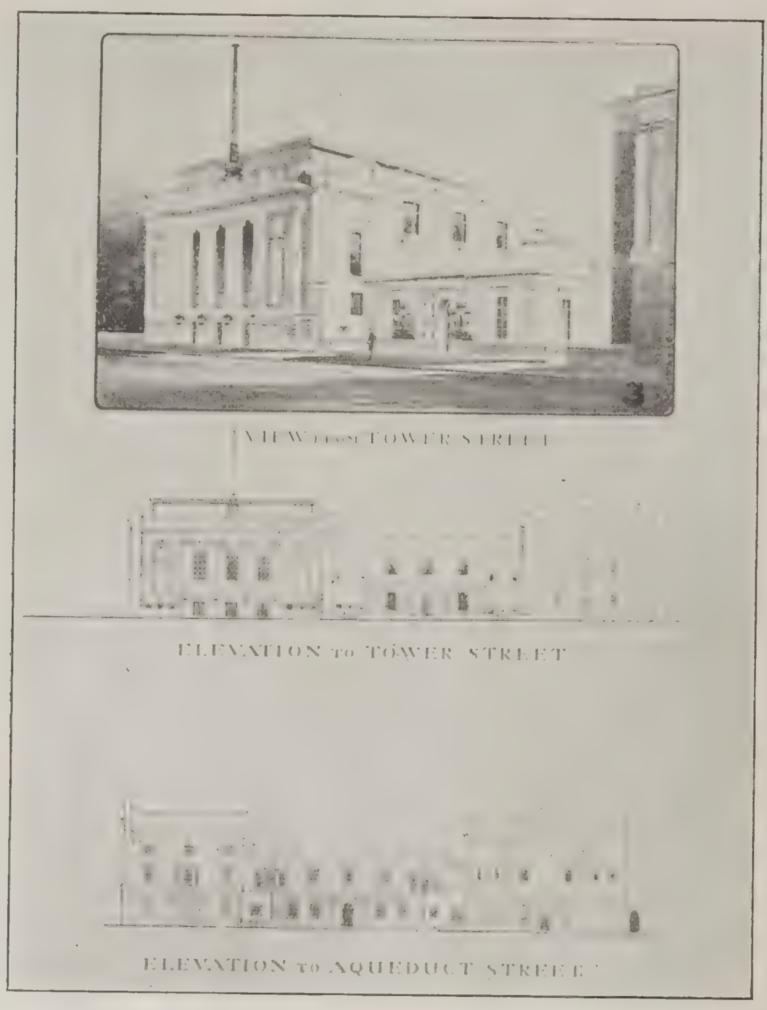
GROUND FLOOR PLAN

FIRST FLOOR PLAN

STOKE-ON-TRENT MUNICIPAL BUILDINGS EXTENSION. PLANS OF SECOND PREMIATED DESIGN. WARWICK AND HALL, ARCHITECTS.

The authors have evolved a plan distinguished by several pleasant features, and with the additional advantage of being more economical than the other premiated schemes. (This copy is a rough sketch of the original)





STOKE-ON-TRENT MUNICIPAL BUILDINGS EXTENSION. THIRD PREMIATED DESIGN. W. HAYWOOD, ARCHITECT.

The elevations show a decided French influence in parts, and it is evident that the author has a genuine feeling for mass, and a real technique in the handling of it.

By far the largest number portray the devil in various forms. The gargoyles, flying out from the cornices and buttresses, typify the driving of the evil spirits out of the church, evil spirits of all descriptions, some with birds' heads and claw feet, others with heads of animals and birds' wings, still others carrying off souls in their stony grasp. Such a mystical animal has a form well adapted to the long, slim character of the projecting waterspout. The upper parapets of Notre Dame de Paris have an intensely interesting group of demons, looking down over the hordes of the great city, ready to swoop like a flock of buzzards on the unwary. These figures are admirably carved, and must have been executed by a master hand.

The gargoyle, in countries where the rainfall is heavy, is long and highly developed, especially in Flanders, Northern France, and England. In the churches of Southern France it has small prominence.

The devil inside the church is largely confined to the capitals and corbels, and is usually busy making trouble for other people, or whispering evil advice into somebody's ear. When not thus engaged, he is frequently reaping the fruit of his efforts, and carrying souls into the jaws of hell. This awful place is a common subject, representing the future life of the evildoers in the maul of a horrible tooth-studded face.

In addition to these domestic and religious subjects, the carver had his fund of folklore to draw on for inspiration. Even Mother Goose figures in the grotesques of Beverley Minster and at Wells. Reynard the Fox symbolises the cunning of the clergy in many places. The cat, the dog, the pig, and mice all have their niches, some symbolic, others merely fancies.

Heads and masks were most popular for the corbels, as they could be readily adapted to the square form. Many a cornice shows an unbroken line of grimaces of every description. The mask is more popular in England than on the Continent.

During the Norman period the grotesques were numerous in the decoration, but the advent of early English limited the use somewhat. Later with the Decorated architecture in England, and the Flamboyant in France, the grotesque was at its height, and protruded its ungainly but interesting shape at every point of vantage. With the advent of Perpendicular the grotesque gradually fell away, and the carvers exercised their ingenuity in developing the intricacies of the canopy, and the armorial bearings, interspersed with rich foliation. The long unbroken lines of the Perpendicular left few capitals or corbels to decorate. The gargoyle also disappeared, since a more effete civilisation demanded that the water be carried off by some more modern method than down the necks of the passers-by. From this point the grotesque passes out of Gothic. In the Renaissance architecture it becomes a copy of the forms found in the Roman ruins, usually an ingenious combination of vegetable and animal, and is confined almost entirely to garden and fountain decoration. What grotesques appear in the treatment of friezes and capitals lack any humorous or symbolic element.

In the Flemish Renaissance they lived for a time, but merely as means of decoration, and, as in the case of the Italian, with no especial significance.

In England the grotesque as a natural product disappeared with the advent of Elizabethan Architecture. It has been revived there to some extent, but most of the modern examples are largely in the nature of caricatures.

In America they have only recently begun to use it as ornament. Sense of the fitness of things would hardly tolerate the carvings on modern Gothic churches that are commonly seen in the older buildings. The former spontaneity of such work has given place to a carefully studied model designed and executed under supervision and by trained workmen.

Modern architectural education has taught that the use of a building may be emphasised by its exterior treatment. This is really an outgrowth of French training, based on the exercise of logic in planning. Thus even in the designing of Gothic buildings the architect not only adopts a general form, which should express the uses of the buildings, but the smallest ornament is modelled with the same end in view. This method is exemplified especially in the new buildings of the College of the City of New York, the West Point buildings, and the new Union Theological Seminary Buildings.

The grotesques used in the College of the City of New York are admirable in their adaptability to the expression requisite for each building. The figures on the main building typify all of the various studies in a way which reminds one of the excellent work of Maxfield Parish. The gymnasium, chemical building, and mechanical arts building are all decorated with little gnomes, busily employed in imitating the various doings within in a way which is vastly entertaining. The grotesque work at West Point is much more conventional in character, modelled in planes, and yet in its way extremely interesting. Both are excellent in their way, and each well adapted to the particular style of Gothic which it adorns.

The secular element of the two groups above admits of the use of actual grotesque. The religious character of the Union Theological Seminary Buildings does not allow such freedom. The ornament there is very restrained, and the grotesques are confined to the library building and tower, depicting the various symbols of knowledge, with the owl, the sphinx and busts of monks typifying pedagogy, thought, research and preaching. The chapel building, while having various ornamental billet courses well adapted to grotesques, has been treated only with angels, cherubs, and evangelists. The ornament of the other buildings consists in armorial bearings or foliation.

The day of the grotesque in church decoration has gone by, but there is still a great field of interesting descriptive ornament to be worked out in domestic and public buildings. The active reintroduction of this element into our Gothic architecture is coincident with that logical movement which is gradually making every building speak for itself and every feature of that building have its *raison d'être*.

The contractor to whom the Llanelly Guardians gave a contract for a boundary wall to cost £595 13s. 6d., wrote to the Board that he had omitted to include £52 for excavating trenches, and was unprepared to sign the contract unless this extra charge was allowed. The Clerk stated that this estimate was still £61 below the next tender. A guardian proposed that new tenders be invited, but after discussion it was agreed to pay the extra £52.

* * *

A sale of land on an unprecendented scale is shortly to take place in Wiltshire. An area of 10,433 acres is to be sold, comprising whole villages. The villages intersecting the estates, together with the village inns, shops, manorial rights, with the lordship of the manor, and certain advowsons are to be sold just as they are. It is years since a sale in lots even approaching such size has taken place. The villages concerned in this huge sale are those of All Cannings, Steeple Langford, Stapleford, and Winterbourne Stoke.

Correspondence.

[*The Editor declines responsibility for the statements made or opinions expressed by correspondents.*]

Houses in Square Formation.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—On p. 151 of your issue of August 25th, you publish a design for four cottages built in the form of a square around a central light well, and invite criticism of same. In the first place, if it were desired to build them in Manchester, I might say that it could not be done. The by-laws would not allow, and the following are two or three of the reasons. (1) The width of open space at the rear of each house is not sufficient. (2) The area of paved yard space, which must also be at the rear of the houses, is insufficient, and also does not extend the whole of the lateral width of the houses. (3) All drains must be outside the curtilage of the proposed buildings. In this case they would not be. With regard to the drains, the whole of what might be termed the internal roofs would have to be drained into the light-well. All four w.c.'s, and the four baths and lavatory wastes would also have to be drained into the same well, as would also the sink wastes from the scullery sinks. All these drains into 7ft. 6in. square, twenty ft. below the roof, and enclosed on all sides.

The pantry, which is, I presume, the only keeping place in the house, would have a window or a ventilator opening into the same well, in which the air would be stagnant and bad from the wastes and other drains.

Again, the whole of the most obnoxious part of the drainage would have to pass under one of the houses, which, according to present day sanitary arrangements, is exceedingly bad. It is stated that one pantry would have French casements, to allow for cleaning the well; which implies that if anything went wrong with the drainage, one house would have all the trouble—all the dirt and most of the smell; besides which, the people in this house would have the greatest chance of ill-effects, such as sickness, etc.

Taking into account the practicability of the houses; in the first place, the coals are in a very awkward position, and to get coal in, which at the most would be only 3 or 4 cwt., one has to pass across the kitchen hearth and through the scullery, or through the living-room and through the scullery; in either case a most unpleasant way for the housewife; for even if they are only cottages, the housewife ought to be considered.

The kitchen also is rather awkwardly planned. The door opening direct from the vestibule on to the fireplace is decidedly bad, and the fact of the scullery and living-room doors opening on to the fireplace from the other side makes the room an uncomfortable one. The idea of opening the front door and entering the living-room in the way as shown, or proceeding upstairs direct from the street, is not a method that commends itself, and reminds one of London cottage flats, or the two up and two down cottages of the North of England.

In dividing up the bedroom plan, there is a slight amount of juggling with the living-room fireplace, and what I take to be the wash-boiler or copper flue, to form a fireplace in one bedroom; from which, along with another fireplace, is carried up a six-flue chimney stack.

In considering cost of building, the arrangement as shown would, I think, be the cheapest; but a row of four cottages with the same accommodation would be more sanitary.

The roof in the design shown would tend to increase the cost slightly, and would cost much more for labour than the row would for roofing.

The fact of the roof cutting down into the bedrooms would, of course, lessen the cost of building considerably; but in some towns and urban districts this would not be allowed.

Taking the scheme as a whole, I do not consider it practicable. As for saving space, yes, it would; but I rather think the cost of roadmaking would counteract the cost of the land or space saved.

R. THOMASSON.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In your issue of the "Builders' Journal" dated August 25th, criticism is invited of a design for four cottages arranged round a central well.

That the design is intended solely for the basis of criticism I am anxious to believe. So let me treat his design lightly, daintily, and playfully.

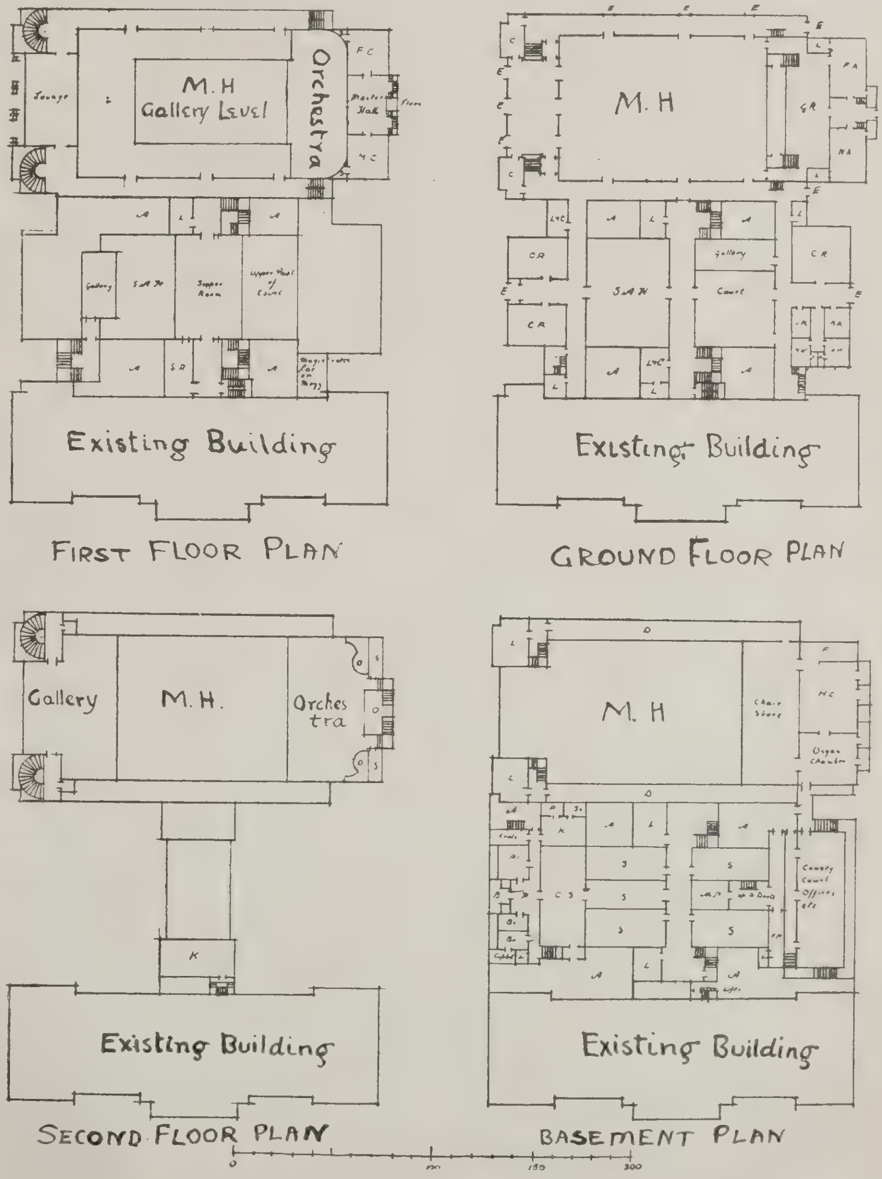
The position of the north point in no way affects criticism. Twist it about as one may, the more advantageous it is to one cottage the greater disadvantage it is to the other. The cottages with the S. and E. or S. and W. living-rooms will have south kitchens, the horror of horrors to the housewife. The cottages with the ideal north kitchen will have N.E. or N. and W. living-rooms, where hardly a ray of sunlight will enter the whole year round. North bedrooms will abound. In fact, it is most humorously heartrending to place the plan in all positions round the compass and note the neutralizing influence of two of the cottages to the joys of the other two.

None of the sculleries get any direct (and they get very little indirect) sunlight. If there's a pleasant view, two of the cottages will revel in it, and the tenants of the remaining two will doubtless get a reduction in rent because of the omission.

The rooms, it is said, are "worked to make the length equal to the diagonal of the breadth." It was too interesting a point to miss, and I thank the author for the thoughtfulness that involved only square roots and not cube roots. Surely such a definite statement ought to convey accuracy, yet, taking the measurements literally, and wading through the rider on Euclids, Prop. 47, Book 1, to check the lengths of the hypotenuses, I found that only the dining-room in each cottage approximates to this proportion—and only approximates. As a general guide for a proportionate room, this is excellent advice, but woe to the designer who makes it a *sine qua non*. Rules like this are apt to become an obsession to the ruin of planning, which should suit individual sites before anything else is considered.

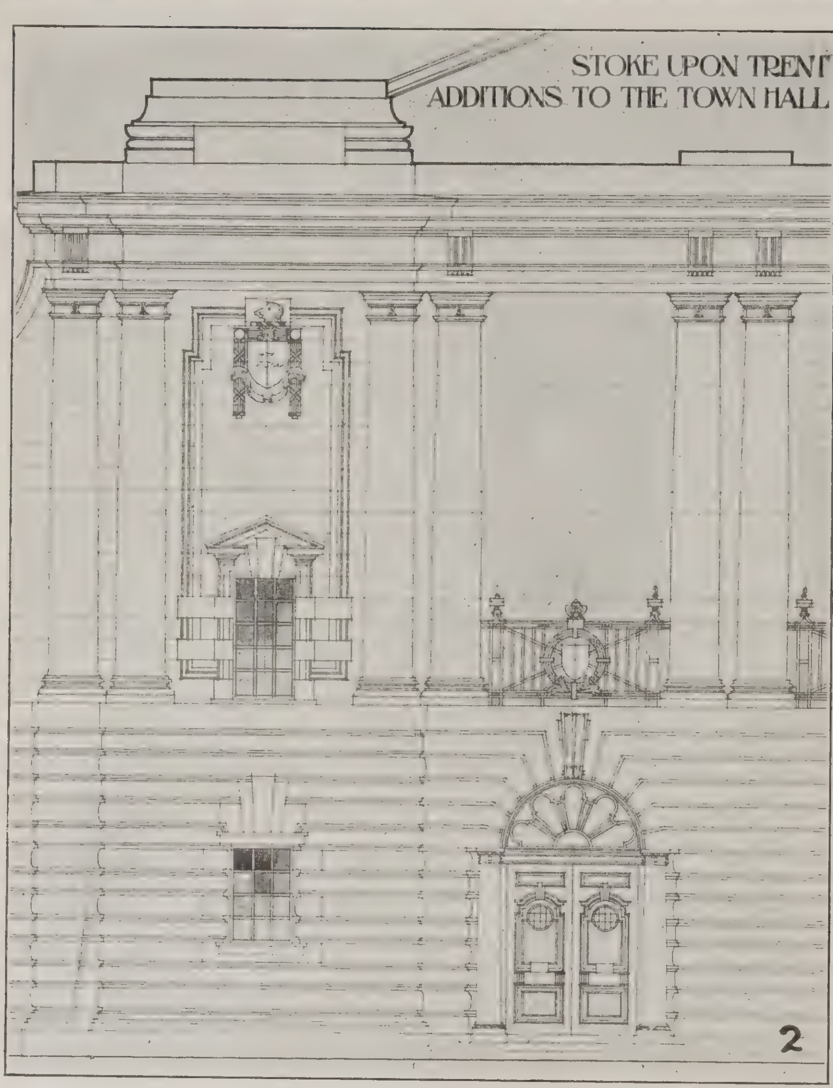
Both kitchen and living-rooms are absolutely without comfort and restfulness. There is nowhere near the fireplace where, on a cold day, one could sit without being in a draught. Doors at either side of fireplace, direct traffic across working or sitting parts of room, as these are planned are the *bête noir* of successful planning. In fact, both rooms are types of what to avoid.

To store coals, the carrier has to go



STOKE-ON-TRENT MUNICIPAL BUILDINGS EXTENSION. PLANS OF THIRD PREMIATED DESIGN. W. HAYWOOD, ARCHITECT.

The plan (of which this is a rough sketch) shows a main hall of good shape, which suffers somewhat, perhaps, from the large area necessarily occupied by the gallery or orchestra.



STOKE-ON-TRENT MUNICIPAL BUILDINGS EXTENSION. DETAIL OF SECOND PREMIATED DESIGN. WARWICK AND HALL, ARCHITECTS.

through kitchen or living-room, whilst the position of fireplace and copper against the coal and fuel store would tend to produce spontaneous combustion.

All sculleries would be dark and ill ventilated. All pantries are ventilated from the small enclosed sewage works called the central well.

Heavy at heart but full of hope, I mount the stairs of thirteen steps in one flight, lit and ventilated by that objectionable feature called a skylight, the lower part of which is in a line with the outlets of four soil ventilation pipes to the drains.

It is pleasant to record that the bedroom plans are very satisfactory in themselves excepting aspects. Still, as it is planned, four bedrooms out of the nine would get the health-giving sunlight.

All the fireplaces are carefully arranged for the satisfactory grouping of the flues into one stack; and if the author of the design had not found it necessary to carry up his stacks through the valley rafters, thus forming double chimney gutters, they would have been even happier.

The chimney caps and placing of pots look weird and unstable; but, judging from the drawings, the flues seem to draw well by this method.

The basement plan calls for no other criticism than that it is, of course, at the root of the troubles.

The roof plan, apart from the necessity of special made valley tiles, or some sort of lead gutter would be required for the intersection of lower part of Mansard roof with the main roof, is satisfactory and economical. Has the author any reason for showing the projecting gables hipped on elevation and sections and not on plan? It seems rather incongruous.

With regard to by-laws, the author has evidently designed the cottages for some out-of-the-way district where such troublesome things are not heard of.

Otherwise I know of no by-laws which would allow the buildings to be erected as planned. I can remember none which has not the clause to the effect that every dwelling house must have at least 15ft. in the rear (and the full width of the building) clear free from any buildings and belonging exclusively to such dwelling. I quote from memory; but such is the gist of the clause. The discrepancy of the plan under cussion is obvious on inspection. A central well, 7ft. 6in. square, is common to all and belonging to neither. To take one's turn in cleaning the well the tenant has to pass through a neighbour's house.

Some districts allow the drainage scheme to be amalgamated as shown, but many do not; and, as planned, it is most unsatisfactory both from its difficulty of access, and from the fact that all baths, lavs., sinks, discharge into the light and ventilation well to the parts of the cottages most needing it; to say nothing of a manhole receiving the combined discharges of the sewage of four cottages under one's nose and in such a confined position.

One can imagine a veritable inferno of noise here at times, plainly audible throughout all the cottages. Drains as shown underneath floors are not ideal in cottage planning especially.

The elevations are the logical outcome of the planning, and as far as can be judged from scale drawings, are æsthetically pleasing.

As to saving of space, the phrase is unsuitable if not wrong. One does not expect, or see, economical cottages covering great areas of ground, and these must be considered analogous to such.

As to space between groups, the only ways that occur to me of building these cottages are between two roads, or by approaching the two rear cottages by means of a path the length of the front gardens, common to both rear cottages in adjoining groups. The only way to obtain space between the two groups is by making the gardens longitudinally parallel to the roads, and the greater or lesser length of garden, which fixes the distance between the groups, fixes also the number more or less of cottage facing the roads, with their necessary initial expense and upkeep to pay for. It is always possible to get air space if one eliminates what it involves, and in this case the getting of air space is not consistent with economical laying out.

The most satisfactory way I have come across of laying out cottages to obtain air space combined with economy is on the chequer-board plan. This method of laying out involves neither loss of aspect, advantages of site, or extra expense in road making.

I congratulate the author on an adaptable temperament which laughs at precedent, and I beg him to believe that I am painfully aware how much easier it is to criticise the evolved than to evolve the would-be criticised.

S. Pointon Taylor (A.).

[The above letters have been submitted to the author of the design, who, it will be remembered, expressly invited criticism of his experiment. He observes that, "The cottages would doubtless require to be erected outside many Council areas, but that does not say that there is anything unsanitary in the idea of the well and central drainage. It would be interesting in this connection to have a legal definition of the rear of such a block. If proper vent pipes were carried to roof, there should be no smell in area. The aspect, of course, is the most serious difficulty, and the block undoubtedly would only be suitable for selected sites."]

Hardships of Tendering.

To the Editor of The Builders' Journal.

Sir,—The particular case to which your correspondent "Heating Engineer," in your issue of September 8, directs attention, as one of the many hardships of tendering, doubtless refers to some instance in which either the scheme itself was laid down and the various contractors had to take off their own quantities, conforming to the requirements of a specification, or in which bills of quantities were supplied, from which estimates had to be prepared.

There is, however, a much worse feature than this—I refer to those cases where schemes and estimates for heating and ventilating installations have to be prepared by the various contractors themselves. In such cases, more often than not the lowest tender is accepted, without regard to the value offered for the amount asked for. To accept the lowest quotation, irrespective of the relative merits of the various schemes, without regard to efficiency, economical working, and low maintenance expenditure is neither just nor wise.

Another hardship is that after a contractor has taken the trouble to prepare an estimate (with probably a scheme as well), he in many cases receives no notification of the fact that he has been unsuccessful; and if he has the temerity to write and ask for this information, and incidentally asks for a list of the tenders submitted, he receives too often a curt reply. A letter recently received from a town clerk is to the effect that "it is not the practice of the Corporation to supply unsuccessful tenderers with a list of the tenders submitted."

In fairness to the architectural profession, I must say that, taken as a whole, they give the various contractors as much information and help as they can. The architects themselves, in most cases, strongly object to having to accept the lowest tender irrespective of all other considerations; and when allowed a perfectly free hand they recommend acceptance, as previously stated by "Heating Engineer," of a tender which in their opinion is most satisfactory, clearly recognising the force of the maxim that if you pay less you get less.

CHAS. F. H. NIGHTINGALE.

South Kensington.

Builders' Locked-up Capital.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Your article under the above title calls attention to perhaps the most cruel grievance from which builders and their sub-contractors suffer.

The worry and anxiety involved in getting settlements is never ending, and most injurious to those responsible for the financial arrangement of firms in the building trade; and no means at present exist to prevent the delays in settling for finished work.

Apparently the persons chiefly responsible for these delays are architects, especially those who undertake both the architectural work and the quantity surveying. Many architects seem to have their minds so keenly set on the new work, in hand or in the air, that they cannot find time to settle accounts until they are worried or shocked into it by some very plain speaking from the builder or the client.

Surely, in the face of the instance to which you referred, and which is only one of many, it is time that the architectural profession came to some understanding with the building trade, which should put a stop to the evil of unduly delayed settlements.

Yours faithfully,

A. G. W.

BERKSHIRE COUNTY COUNCIL OFFICES, READING.

This open competition resulted in a collection of no less than 177 designs, of which the majority were well above the average of the class of work usually submitted for this kind of building, and amongst them were to be found the drawings of many of the leading members of the profession. The popularity of the competition may be attributed to the fact that the premiums offered were rather above the average, being £100 for the first, and £70 and £50 for the 2nd and 3rd respectively, while the cost of the building was not to exceed £16,000; and also, no doubt, the profession felt every confidence in the appointment of such a competent and experienced assessor as Mr. Mervyn Macartney.

The site is situated in the Forbury, overlooking the Gardens, and between the Sessions House and Messrs. Sutton's premises. The County Council requested the president of the Royal Institute of British Architects to appoint the assessor; and the conditions issued said: "Mr. Macartney will place the designs in their order of merit; but the Council is at full liberty to select the design it considers best suited to its requirements."

This clause, very properly, the R.I.B.A. took exception to, as it practically set the assessor's decision at nought. After considerable delay it was decided that this clause should be altered, and that the Council should undertake to employ, in the event of the work being proceeded with, one of the three first architects so placed by the assessor.

The site presented many difficulties, having only 64ft. frontage and being 93ft. deep, and a certain amount of space being available in the existing Assize Courts. The rights of light were very awkwardly restricted, only the middle portion of the west elevation being available for windows, and all windows facing south or west having to be constructed so that they should not open for a height of 6ft. above the floor. The drawings required were a plan of each floor, four elevations, two sections, all to a scale of 8ft. to an inch, and a detail of a portion of the front elevation to a scale of 2ft. to an inch. No perspective was admitted. The drawings were to be in pen and ink, and the elevations had to be coloured to indicate the materials to be used.

The elevation of the Forbury was to be brick, with Portland stone dressing, to the east (up to the Assize Court), to be left to the discretion of the competitor, the west and south elevations to be red brick.

The accommodation required was to include: Clerks' department, with an area of 3,005 super ft.; education secretary's department, 3,670 super ft.; medical officer's department, 1,025 super ft.; county treasurer's department, 2,035 super ft.; county surveyor's department, 1,715 super ft.; and the land steward's department, 825 super ft. In addition there were to be two committee rooms, not less than 600 super ft. each, one of which was to be on the same floor as the education department. Storage accommodation for 40 bicycles was to be provided.

The first premium has been awarded to Messrs. Warwick and Hall, of Grays Inn, London, W.C., the second to Mr. E. F. Shrewsbury, of Maidenhead, and the third to Messrs. Wills and Anderson of London. The competition has been won, as was a foregone conclusion in the case of a building for this purpose, by its plan. It must have been much against the assessor's feelings to have to disregard some of the excellent elevations submitted because their plans did not absolutely meet the requirements.

No one, on careful examination, can dispute the fact that the plan placed first is far and away the best of the three premiated designs. It is a good symmetrical and economical plan. Access to all parts of the building has been well considered. The stairs and lift are in quite the best position, and the area, although not unduly large, is, as arranged, sufficient to do its work. On the whole the plan is well lighted, but all the doors in the corridors are not quite so good in this respect as in the plans placed second. A good effect is obtained in the front rooms on the ground floor by the windows being placed in alcoves. It is not obvious how coals can be delivered into the cellar, or how the bicycles will be got into their store-space (which, by the way, hardly appears sufficient for 40 bicycles), as it appears the only access to these is by a lane, which is the private property of Messrs. Sutton's.

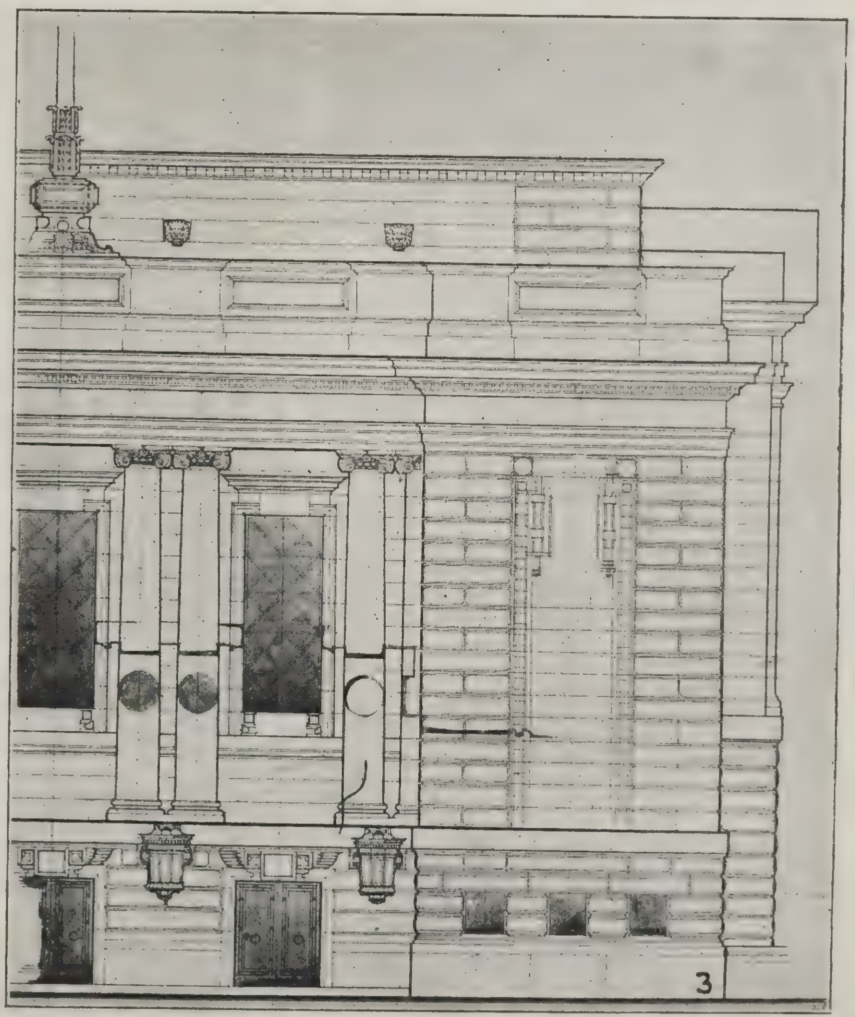
The small frontage, and the fact that 4 floors were necessary to provide the accommodation required, presented a serious difficulty; the height of the front elevation was sure to be too great for its width.

The first design gets over this well, a dwarfing effect being obtained by strong horizontal shadows under very bold eaves, and also under the Doric order, which runs through the centre of the façade. This screen of twin columns will certainly look well when built, and is a strong point of the design.

The proportion of the windows themselves, and also of their divisions, has been carefully treated, with a satisfactory result.

The other elevations are suitable, but the conditions do not appear to have been adhered to absolutely, red brick only being specified, but stone dressings having been used. It is doubtful how successful the treatment of the recess on the side elevation may be in perspective. The drawing appears to indicate the face of the wall lining up with the face of the long dormer above it.

It would have been interesting to see both in the 1st and the 3rd designs the proposed treatment of the portion of elevation return-



STOKE-ON-TRENT MUNICIPAL BUILDINGS EXTENSION. DETAIL OF THIRD PREMIATED DESIGN. W. HAYWOOD, ARCHITECT.

ing to the Sessions House on the east side of the building, especially as it was asked for.

The design placed second has evidently obtained its position entirely by its plan. It is better lighted than the winning design, and on the whole well arranged. Three areas have had to be resorted to, and being of so small a size would have their disadvantages. The passages are, perhaps, rather narrow for their purposes. The plans, however, throughout show a very careful study and an intimate knowledge of the requirements of a county council.

The third design differs from nearly all the other competitors, by utilising the site right up to the building line all the way along on the west elevation. In nearly every case the centre portion was set back in a recess to obtain light. This plan also is thoroughly well lighted, the large area in the middle very efficiently lighting the corridor all round it and the staircase. A glance suffices to show, however, that in the matter of accessibility to all parts, this design is less convenient than the others The entrance, and therefore the lift, being at the side of the building, lands you on every floor at a considerable distance from nearly all the rooms. The general offices, which should be the most accessible to the lift and staircase, are the least so. On the second floor, with another storey above it, and only one small window to the room, does not appear to be the best position for a sun-printing room. With regard to the elevations of the third design, a low appearance, as in the first, has been properly striven after. Rusticated work has been freely used, the horizontal lines of which, with the assistance of a heavy top cornice surmounted by a mansard roof, prevent the building from looking too high. The centre portion, being recessed behind some well proportioned Ionic columns, would have a good effect. The front façade is more severe than that of the first, and no doubt many would say, therefore, more in character with the purpose of the building.

A very large percentage of the front façade consists of glass window, but as the space is well divided, this might not look so excessive in execution as it does on the drawing. No money certainly is wasted on the other elevations, and this sudden falling off from the front would have had an unpleasant effect from where both elevations would have been visible at the same time, giving rather the appearance of the front elevation having been stuck on.

Of the three premiated designs, the one placed first is, in the writer's opinion, very far ahead of the other two, and the council can congratulate themselves on having obtained an excellent design.

Mr. Frederick Chatterton, A.R.I.B.A., has been appointed assistant lecturer in architecture and building construction at the School of Engineering, Giza, Cairo.

* * *

The formation of a huge Canadian cement combine is announced. Ten large companies are to unite under the title of the Canadian Cement Company, with a capital of thirty-eight million dollars.

* * *

We are informed that Prof. S. P. Thompson, D.Sc., F.R.S., has consented to become first president of the Illuminating Engineering Society, of which the hon. secretary is Mr. L. Gaster, 32, Victoria Street, London, S.W.

* * *

A new type of bridge, over the Pennsylvania Railroad line, in Philadelphia, has its concreted floor suspended from an arch that consists of a steel box girder filled with concrete.

* * *

An alarming accident occurred in Southwark, opposite the large parcels post sorting office in Union Street, part of an empty warehouse collapsing, and at the same time demolishing the backs of several dwelling-houses in Pepper Street. Only one person was injured, and that but silghtly .

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Oct. 1.	ABERDARE HOSPITAL. The Aberdare Urban District Council invite competitive designs for a fever hospital for 52 patients, including administrative block, outbuildings, etc. Premiums of £100, £50, and £25 for the designs placed first, second, and third respectively. An Architectural Assessor will be appointed on the nomination of the President of the Royal Institute of British Architects: also a Medical Assessor to act jointly. Particulars and conditions of the competition, together with a plan of the site, may be obtained from T. Phillips, clerk, Town Hall, Aberdare, on deposit of £3 3s.
Oct. 11.	HULL TRAINING COLLEGE for Teachers in Elementary Schools. The Education Committee invites Architects to submit designs. Premiums of £150, £100, and £50 to authors of the designs placed 1st, 2nd, and 3rd respectively. Particulars and plan of site may be obtained of J. T. Riley, Secretary of Education, Albion St., Hull. Deposit, One Guinea, returnable on receipt of *bona fide* design, or the return of particulars within 14 days.
Nov. 30.	HERNE BAY PAVILION ON PIER. Herne Bay Urban District Council invite competitive drawings for a pavilion to be erected on the proposed extension of the pier at a total cost not exceeding £4,000, exclusive of architect's commission. Premiums of twenty-five guineas and ten guineas respectively will be awarded for such two designs as shall be judged of sufficient merit by the Council, and placed by them as first and second; the premium of twenty-five guineas to be afterwards merged into the usual commission payable to the architect, provided the work is carried out by such competitor. Plan of the site and copy of the conditions may be obtained on application to the undersigned on and after the 24th instant on payment of one guinea, which will be returned on receipt of a bona-fide design. Drawings to be deposited at the Clerk's Office, Town Hall, Herne Bay, not later than noon on the 30th November next.—Joseph Jubb, Clerk to the Council, Town Hall, Herne Bay.
Nov. 1.	TECHNICAL SCHOOL. The Corporation of the Borough of Kendal invite architects residing and practising in Westmorland to submit a competitive design, together with a written description and estimate for the erection of a technical school. Premiums of £15, £10, and £5, are offered: the designs to become the property of the Corporation. Particulars may be obtained free from the Borough Surveyor.
Nov. 1.	PRESTON GRAMMAR SCHOOL FOR BOYS. Preston Town Council invite competitive designs and plans from architects practising as principals, for a new grammar school for boys, to be erected in Moor Park Avenue, Preston, and estimates for the same. Premiums of £50, £30, and £20 are offered. The Corporation have appointed a professional assessor. Application to be made to Mr. Alfred Howarth, Town Clerk, Town Hall, Preston, and designs and plans must be sent in by 10 a.m. on Nov. 1.
Jan. 31, 1910.	NATIONAL MUSEUM OF WALES. The Council desires to receive competitive designs for the erection of a new National Museum at Cardiff, Three premiums are offered of £200, £150, and £100, for second, third, and fourth. The Council have appointed Sir Aston Webb, R.A., Mr. John J. Burnet A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A., as Assessors. Particulars and plans of the site will be supplied to competitors on payment of a fee of £2 2s., which will be returned on receipt of a design in accordance with the conditions, or if all papers are returned within 14 days. Inquiries to be addressed to Dr. Wm. Evans. Hoyle. Director of the Museums, City Hall, Cardiff.

Grimsby Town Hall Extension.

Sir Alfred Gelder, F.R.I.B.A., the assessor in the competition, has submitted to the Finance Committee of Grimsby Town Council his report upon the fifty-one sets of plans received for carrying the extensions into effect at a cost of £26,000. Three premiums were offered, the first of £250, the second of £150, and the third of £100. Sir Alfred, in his report, said that the task set the competitors in having to adapt the present building was harder than in having to create an entirely new building. The competitors on the whole had done excellently, and, while some had exceeded the cost stipulated, the majority had kept close to the figure and endeavoured to provide the accommodation required at the price named. He personally held the opinion that the accommodation asked for was too much for the price allowed. Having regard to all these points, he awarded the prizes in the following order:—1st, Set No. 18; 2nd, Set No. 44; 3rd, Set No. 47. The Borough Surveyor then opened the sealed envelopes, and the successful competitors were announced as—1st, Messrs. Eade, Johns, and Browne, Ipswich; 2nd, Messrs. Withers and Meredith, 50, Cannon Street, London; 3rd, Messrs. Rigby, Oliver, and Phipps, Market Street, Manchester. With regard to the third set of plans, Mr. Atkinson pointed out that the estimate was £30,207, with a further £3,179 if the tower shown in the designs were decided upon. As the figure given in the conditions was £26,000, he (Mr. Atkinson) would like to know if the set of plans really complied with the conditions. The Borough Engineer said that a margin of 10 per cent. was allowed on the £26,000, and, of course, the third set were outside that limit. The estimate for the first set was £26,657, and the second £27,566. The committee decided to accept the sets awarded the first and second premiums, and referred the third set back to Sir Alfred Gelder, to ask his advice regarding the compatibility of the estimate with the conditions.

Stoke Town Hall.

It is stated in the local Press that at a meeting of Stoke Town Council it was suggested that Messrs. Wallis and Bowden, architects, 33, Old Queen Street, Westminster, should be asked to prepare plans to come within the stipulated sum of £25,000. It is further stated that the Council had decided to interview Messrs. Wallis and Bowden, who were among the competitors, and whose design was regarded as most nearly approaching the council's requirements.

Middlesbrough Library.

At a meeting of the Middlesbrough Free Library Committee, held on September 9th, Mr. J. S. Calvert presiding, the Librarian (Mr. Baker Hudson) reported that, after consultation with the chairman, he had consulted Messrs. Russell and Cooper, London, respecting suggested modifications in the plans for the new library. As a result, Mr. Russell was present that day with the plans for the committee's approval. Councillor W. G. Roberts thought that the modifications shown in the plans before them were without a single exception a decided improvement, and would facilitate the working of the library. The plans were handed round and examined in detail by those present, Mr. Russell explaining them where necessary. Councillor Roberts moved that the alterations be approved, and that the architects be instructed to carry out the plans on the lines indicated as speedily as possible. This was seconded and adopted. The committee agreed to the recommendation that Messrs. Watson and Webster, of London, should be appointed quantity surveyors. In reply to the chairman, Mr. Russell expressed the opinion that the building could be completed in 18 months' time. He thought it would be about the end of October before they would be ready for inviting tenders. It was agreed that the architects should report to the committee when they were ready for tendering.

CONCRETE AND STEEL SECTION.

(MONTHLY.)

Flexure. It is strange to note the confusion of ideas which seems to exist in the minds of many students of steel and concrete construction as to what really is the nature of the stresses in structures, and the manner in which these can be resisted. No doubt this confusion arises in great part because the works of the authors of the special text-books are not at all clear in their own minds about such matters, and even when they are, ambiguity of expression obscures their meaning. No doubt the loose use of words to express several meanings, and indeed to serve a purpose for which they were never intended, is responsible for some of this understanding. We are not here concerned with the pedantic insistence on purity of language. We simply wish to point out how easily confusion of thought might lead to erroneous deduction. For instance, we talk about beam action. Well, we can have beam action in a cantilever and in an arch, if by beam action is meant resistance to bending stresses, but when using the word "beam" we ought to confine it not to any-beam, but to a beam which extends directly thing which has to resist flexure, like a between two supports only. We find the confusion about beam action still greater in connection with floor slabs, which are often spoken of as having beam action in them. It is only so if a slab is supported on two edges, but as soon as it is supported on three or four edges it becomes a plate, and should be spoken of as such. A cantilever really can in no sense be called a beam. An arch and a column still further diverge from beam action. All these constructive elements, however, are called upon to resist flexure or bending, and when beam action is spoken of flexure is really meant, and authors ought to say so. We sometimes hear discussions about continuous beams, and people talk about the cantilever action over the supports. There is nothing of the sort in a continuous beam. It acts as a beam and not as a cantilever. It is quite possible to construct a line of cantilevers sustaining beams, the divisions being placed just where the points of contraflexure occur in continuous beams, and under distributed loading the bending moment will be the same as the truly continuous beam, over the same supports, or a beam completely fixed at the ends has the same bending moment as a bracket sustaining beams, where the points of division are situated at the same distance as the points of contraflexure in the beams. The continuous beam, however, has no cantilever action, properly speaking, as in practice the stresses are very different; the bending moment is simply reversed in sign over the support, and the continuity results in unequal loading on one span, causing stresses that are often indeterminate to be produced in other spans, whereas with a cantilever, which may or may not be discontinuous, unequal loading is not carried to the same extent to the other spans, and the stresses are determinate. Though cantilevers are easily constructed with pin joints or with complete severance of the beam from the cantilever, the former being supported upon the latter, or suspended from the latter, it is not necessary that a cantilever should be so constructed. All that is necessary is to arrange the parts to resist the stresses which would arise in a structure designed with these assumptions. We can, in designing work, make any reasonable assumptions as regards whether we shall make our members in the form of beams, arches, cantilevers, or plates, and if we construct them in accordance with any one of these assumptions, then they will act in that way, unless, of course, they are constructed as to more easily act in some other fashion.

Floor Slabs. In regard to this latter aspect of the subject we may, for instance, refer to reinforced concrete floor slabs. These we often construct to act as beams or as plates, and we reinforced them to resist flexure, but, in providing sufficient steel for this purpose, and in making the slabs continuous over the supports, we may so arrange the reinforcement, and provide such an amount of steel that, instead of their acting in this way, they act as cantilevers and suspended plates or beams. Or, again, if the surrounding beams and neighbouring slabs give such rigid abutment that the slab cannot give and act as a beam, and if we provide sufficient thickness in the centre, then the slab will act as a flat dome, in which case the amount of reinforcement can be very considerably reduced and the arrangement altered.

Arched Roof Principals. There have been several examples recently where arched roof principals have been built in reinforced concrete, and though these have the form of an arch they really do not act as such. They are so reinforced as to act as curved beams, and there is no thrust such as there would be in an arch. They can be more strictly termed curved ribs, and are allied to the steel rib. We find, too, bridges of an arched form constructed with pivots, but here again the principle of construction is not the same as the disjointed masonry arch, and the arched ribs are called upon to resist a bending moment as well as a thrust. In reinforced concrete arched ribs, however, usually no pin joints are provided, and the reactions are vertical. In some cases we can analyse the roof truss more easily as a curved beam resting upon stanchions, which it loads eccentrically. In other cases, however, we can only analyse the structure as a curved beam, the side portions not then serving as eccentrically loaded stanchions, but as the portions of the beam near the support. Now, in such a design the amount of steel that is necessary, and the form and shape of the rib, is very different from what would be required were the truss a true arch. In a true arch the thrust is not vertical at the supports, and the arch requires an abutment or tie at the feet, or springings. The smallest section then occurs at the centre of the span, whereas in a curved beam the greatest depth is there situated. With a true arch much less steel is required, but the thrust at the abutments may be objectionable, and consequently it may be preferable to treat it as an arched rib. Then, again, if the assumption is that the rib is to act partly as an eccentrically loaded stanchion, and partly as a curved beam resting thereon, then the amount of reinforcement will again vary.

The Outward Form. We see, therefore, that the outward form, though much the same, is really no criterion of the manner in which the constructive member will act. We may treat it in several ways, and whichever way we treat it we shall be correct, and the structure will act in that way, if it cannot better act in some other way. The student usually assumes that because a member is of a certain form it must act only in the way which, as he learns from his books, it is customary to assume such forms to act. This, perhaps, is the reason why we find such surprise expressed at the rather novel method of construction employed by reinforced concrete engineers. It often is a matter for wonderment how reinforced concrete arched trusses stand without giving any thrust at the abutments. Then again, a bridge that has been calculated as part cantilever and part girder, but the intrados curved, is also thought to have an arched action, and viewed from this standpoint surprise is expressed that reinforcements are not so disposed.

Architectural Treatment of Reinforced Concrete. We see, therefore, that the form in a reinforced concrete structure, and also in steel work, must not be judged by ideas associated with masonry or brickwork constructions, nor, indeed, with timber. Architects, as a rule, view all matters from these points of view, as they have been trained to study examples of construction carried out many years ago, and they therefore think that constructive members having the same form as these earlier examples must act in the same way. They should bear in mind, however, that we are nowadays using two very, very different materials, viz., concrete and steel, which have resulted in complete departures in methods of construction. Eventually the architectural profession, and perhaps in time the public, will get to realise instinctively the difference in the types of construction though they bear the same outward form. At present the appearance of reinforced concrete and steel work is judged by canons of taste derived from other methods of construction, and to the eye which has been trained instinctively or by education to recognise and appreciate the structure of those forms built up in the past on other methods and with other materials, steel work and reinforced concrete naturally appear ungainly and inartistic; but when the profession begin to realise the logic of their forms, and gets instinctively and educationally to appreciate their true structure, then they will come to realise that beauty in architecture springs from constructional fitness, and not from any machine applied scenic canons. The styles are derived from an architecture of stone, and if we apply them to an architecture of any other material then they can only satisfy the eye by an imitation of stone, or by the suggestion that they are stone. Looked at from any other point of view they are absolutely illogical, and when this is realised they become foolish and indeed ugly. There is, of course, the general form and outline—the play of curved line against straight line, and symmetry and proportion of mass to be considered in an architectural problem, but these are other matters outside the foregoing argument. The architect, of course, should study such general features, but when he has gone so far then the other details should be left to work themselves out. It will, no doubt, be a good many years before we are able to deal thoroughly satisfactorily with the newer architecture of steel and reinforced concrete, but by a frank acceptance of the construction we shall arrive at a modern architecture much sooner and with far greater promise of success.

Cantilevers. We are, however, able to do weird things with steel and reinforced concrete, such as extending balconies and supporting almost whole buildings upon cantilevers; hanging compartments, too, in mid air, by suspending them from beams overhead. These are objectionable features because, as a rule, they spring from some commercial requirement that is not truly logical, the outcome, perhaps, of some desire to arrive at a certain result by some roundabout method, because other things prevent a straightforward and truly economical solution of the problem. But it is unfair to use such instances to support a contention that materials and methods of construction that permit such things to be done easily are therefore bad and inartistic; they only serve as examples to show how dependent we are upon the fitness of every portion of the structure in order to obtain architecture. The architect who is called upon to design a structure which is out of place, or required to serve some purpose which is not a true need of the community cannot expect to make a truly architectonic structure. He may make it scenic, he may make it pretty, but it is not architecture. Then again, certain buildings which have to serve a lower commercial use can obviously never rank so high in the architectural scale as structures which serve a higher purpose. For instance, a warehouse can never rank with a cathedral, though the one may be as fit for its purpose as the other, no more than a humble flower can compare with a higher form of vegetation, but each should be beautiful in its way, and such beauty is only obtained by fitness. We are fortunate to-day to have these facts better recognised by architects, and an attempt is being made by the architectural profession in reinforced concrete and steel work to apply these new materials and methods in a more logical manner. Several architects have called attention to the fact that in reinforced concrete we have a method of construction which is different from that which has preceded it in the history of any past age of building, and embodies principles which are entirely revolutionary in character.

The Architect's Chance.

We therefore see that the modern architect has given to his hand the chance to arrive at an architecture which shall be entirely different from any that has preceded it, and which can be as fine and as noble as the architecture of Greece, Egypt, or Rome, or, indeed, of the Gothic period. To the engineer reinforced concrete is extremely interesting, because of the many problems it provides for solution. The design of structures in reinforced concrete is much more difficult and intricate than steel work, and if the latter has provided many interesting features and novel constructions, reinforced concrete promises still more. To the architect also reinforced concrete in its way is quite as interesting as to the engineer, for in studying it the architect can feel that he has a chance of doing work that shall compare favourably with the work of past generations of architects, and in employing it there is no reason why there should not be as much enthusiasm and as much interest displayed as was doubtless to be found among the architects of Greece and the architects of the Middle Ages, when inventing and employing their methods of building and devising forms which should express the function of their structures.

French Reinforced Concrete Designs.

There is one feature in respect of the design of reinforced concrete structures made by French engineers which must surely have struck anyone who has studied published designs, that is, the remarkable ingenuity displayed, and the novelty and invention. Engineers in France (and, indeed, in Germany) are educated much more thoroughly than they are in England in respect to the theory, and though this has its disadvantages in often increasing cost by over elaboration in design, yet it more often results in a much closer analysis of the stresses in structures, and this draws attention to important factors present but often overlooked, and leads to a better understanding of the nature of these stresses. In French work it will generally be noticed that structures are designed with an interlacing network of ribs and beams, modelled on the lines of timber or stone structures, just as the fancy seemed to strike the designer. In some cases these forms have been arrived at by reference to the results of practical experience in connection with structures built with other materials. In other cases they have been arrived at by a process of very elaborate analysis. After the structures have been built they have, fortunately, been carefully tested, and the facts recorded, so that we know how far the designer's theories have conformed to fact. This elaboration in England would undoubtedly greatly increase the cost of structures, for the workmen here do not take so great an interest in such work as they do in France. The French mechanic of the superior class is to be relied upon, and he seems to like novel work. The result is that though the work may be very elaborate, in many cases the cost is not so greatly increased as one would suppose. Though there are many contractors in France who appreciate the advantages of simplicity in respect to economy, we think that in America and in England contractors study this aspect of the work more than is done in France or Germany.

Centering for Reinforced Concrete.

Economical methods of carrying out reinforced concrete have now been worked out in considerable detail as regards the design of the structural members, and economical methods of disposing the steelwork and manufacturing the same. The handling of the concrete by means of mechanical mixers and electric hoists has reached a point at which we can see that there is not much more saving to be effected in execution. There is, however, one element in which we can clearly see that economy is possible, and that is in respect of centering. There is, indeed, an enormous waste of material and labour in the erection and re-erection of timber centering. We use timber because it is at present the most economical material, but a light form of metal sheeting would stand much more wear and tear, and it would be hardly any heavier to handle. The nature of practical work, however, differs so from job to job that standardised centering cannot be used generally. In England, at any rate, it is seldom that we have a building planned out on such regular lines that the floors can be repeated over and over again, and the centering used many times over; therefore, to use a standard form of centering we should have to find one which would be capable of modification to suit varying circumstances that occur in practice, or we could use it perhaps advantageously for parts of structures which conform to some sort of general standardised form, though we can see possibilities of economy in this respect.

The Commercial Aspect.

The fact, however, that we pay more attention to the commercial aspect of the subject is to be regretted, because, in a science such as reinforced concrete, which has only grown up within the last few years, and is still to a great extent in its infancy, there is any amount of room for experience, and we can learn much from these ingenious methods employed in France. There are often two or three ways of getting at a result, any one of which is hardly any more costly than another in the end, and the benefit of trying all these varying methods of getting at one result is that we may discover points in every method that can be advantageously combined with points from another method in future jobs. Most remarkable results have been obtained by French contractors; they have shown us wonderful resistance in buildings by extraordinary tests. Much information has been gleaned from these tests, but it is surprising that though these structures have been designed from a theoretical point of view, yet, when it comes to analysing the results of these tests, the matter is often regarded more from a practical point of view. Of course, the analysis of full-sized tests of building structures is very difficult to conduct, and requires very great scientific ability, but there are many engineers in France who are thoroughly competent to undertake such research, and therefore, though we can well understand the practical contractors not being able to find sufficient time, or perhaps to display sufficient theoretical ability, to analyse the results completely themselves, we are rather surprised that they do not engage the theoretical talent, or that the professors of schools and colleges do not themselves undertake the work of analysis. There have been a few professors in France who have done this, and have furnished us with an immense amount of information which has been most valuable and improved our general knowledge of the science of construction in reinforced concrete. As, however, we are unable to have provided for us always a close analysis by French engineers of the work of their own constructors, it is important that engineers in this country and elsewhere who have the time and opportunity should study closely the work of constructors in France, and also, it may be said, in Germany and Austria, who employ novel methods in preference to standardising the practice such as seems to be the tendency in this country and in the United States, for it seems evident that by a close study of these somewhat experimental works we should obtain much information that would advance the practice and theory of reinforced concrete and of structural design generally.

Metal Centering.

Unfortunately, up to the present, no standard metal centering has been devised that is capable of general adoption. Some attempt has been made to improve the method of centering in timber, but not very successfully. There is no doubt the need will lead to something satisfactory being discovered shortly. Whatever form of metal centering is eventually invented, it will have to be of such a nature as to be adaptable to many variations in practice; for instance, if it is to be used for floor slabs it must be possible to vary the size and shape of the floor slab considerably. Then, as regards the beam boxes, not only must the width vary, but the depth also. It is possible, perhaps, on some jobs to keep the beams of fairly uniform width, but the depth would certainly have to vary. This need not create much trouble, because one can easily shift the bottom board or support up or down within the sides of the box. Then, for columns, the centering should be capable of being varied very considerably, not only as regards heights, but as regards the width of the sides of the columns. Some form of very thin sheet iron or tin plate appears to be the most promising material from which to construct such standard centering, and it would be possible to stiffen it by means of securely attached angles or tees, or one could employ timber struts to support it, arranged some distance apart in contra-distinction to placing them closely together as with timber centering. There have been a few sheet iron centerings introduced, but they very often consist of curved sheets which are objectionable because they give a curved socket to concrete floors. In other cases the metal sheeting has been left in position to form a permanent centering. This, though it is not so extravagant as might be thought, has its objections, because it is liable to rusting and is unsightly unless covered up, and if the latter is done, the cost is increased to a prohibitive figure. There is plenty of scope for ingenuity in the invention and devising of such standardised centering, and we hope that before very long it will be possible to reduce the cost of erecting structures of reinforced concrete by the adoption of such improved methods. Having now advanced sufficiently far to be able to effect very great economy in all other directions, namely, in designing and the executing of the practical concrete work, it only remains to economise in the centering to still further reduce the cost of reinforced concrete, and bring it into increasing use.

REINFORCED CONCRETE PILES.

(Continued from page 133, No. 758.)

Belonging to the first division of moulded reinforced concrete piles is the "Chenoweth," but this pile is not exactly moulded in the ordinary sense, namely, by being cast in a box. The pile is round, and is made without forms or boxing on a special apparatus. Its form is shown in Fig. 1. It has a steel pipe or rod in the centre to which is attached by means of small rivets driven into holes slightly smaller a sheet of ordinary black wire fabric of No. 16 U.S. gauge, with ½in. mesh, of the length required to make the pile. The other edge of the sheet is attached to a movable platform which is pulled towards the core as it is wound up. On this sheet is placed the other reinforcement, consisting of longitudinal bars, and the whole is covered with a layer of fine concrete. The mass is then wound up by means of an apparatus consisting of a travelling platform to which the sheet is attached by one edge and a roller; the pile is formed thus, the winding pipe or rod in the centre is set in line with the shaft of a large spur wheel, the pipe or rod in the centre is rotated, and the netting and its covering of concrete is wound or coiled up, while, at the same time and as fast as the netting and concrete are coiled up, the platform moves under the roll, and the roll itself rotates. The forming cylinder of concrete is by this means kept under constant and heavy pressure between the platform and the roller. The roll of concrete is bound by wires placed round it at close intervals and tied, these wires being contained on spools arranged between the moving platform spaced every six inches along the pile and fastened to the wire mesh, so that when the pile reaches the lower edge of the platform it can be revolved about the axis, causing the wire to be wound on the pile. In this manner the wire is passed around the pile a number of times and secured. At the driving end of the pile the spools are placed 4in. apart for the first 6ft. of the pile, and then 6in. apart for the remainder of its length. In some cases another method of fastening the other edge of the wire cloth has been adopted, namely, to substitute for the wire ties rivets with their ends upset, so that they are of slightly larger diameter than the mesh of the cloth. These rivets are inserted in the outer edge of the cloth with these upset ends upwards, and as the piles are rolled up they are forced into the meshes of the fabric into the body of the pile, thus buttoning it together, as it were. When the pile has been thus formed it is rolled still further on the inclined platform, so that without any lifting the completed pile is rolled therefrom to the truck which is to carry it to the seasoning yard. The platform of the truck is also inclined, and when the car has reached the yard the pile is rolled to its place. By this method no large plant except the rolling device is required to handle the pile during its moulding stage. The concrete used in forming these piles is generally proportioned 1 : 2 : 3. As regards the means of driving these piles into place, a driving head is usually favoured, and when sinking by means of a water jet is resorted to, the core consists of the pipe above referred to down which water is passed. Fig. 2 shows the form of driving cap which is being used with these circular piles, but its form can be modified to serve for other sections of pile. It will be seen that the cap has side flanges to travel in the guides. The Chenoweth pile has been constructed up to 61ft. in length, and these piles after having been driven have been pulled out for examination and found to be intact, and redriven. Like other reinforced concrete piles, they appear to stand very severe treatment. In one instance an attempt was made to destroy a pile by over-driving; when it was pulled up for examination the only apparent injury was the mashing or brooming of the upper two feet of the butt end. Another moulded pile is that shown in Fig. 3, and made by the British Reinforced Concrete Engineering Company, Ltd., of 196, Deansgate, Manchester. In this design special patented binders that keep the rods in place and have ends extending to the centre of the post to reinforce the core are used, and increase the strength.

A special patent reinforced concrete pile that has been used for the foundations of some of the tall buildings in New York is constructed as follows :—

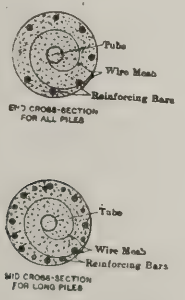

Tube
Wire Mesh
Reinforcing Bars
END CROSS-SECTION FOR ALL PILES
Tube
Wire Mesh
Reinforcing Bars
MID CROSS-SECTION FOR LONG PILES

FIG. 1.—THE "CHENOWETH" PILE.

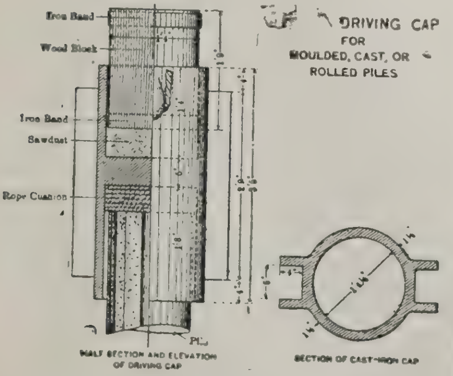

Iron Band
Wood Block
Iron Band
Sawdust
Rope Cushion
Pile
HALF SECTION AND ELEVATION OF DRIVING CAP
DRIVING CAP FOR MOULDED, CAST, OR ROLLED PILES
SECTION OF CAST-IRON CAP

FIG. 2.—DRIVING CAP FOR "CHENOWETH" PILES.

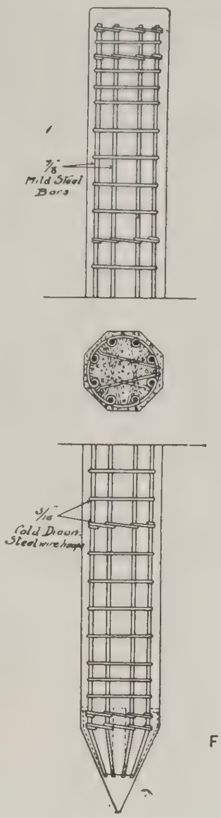


FIG. 3.—THE BRITISH REINFORCED CONCRETE ENGINEERING CO.'S PILE.

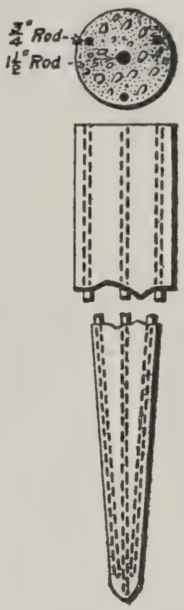


FIG. 4.—RAYMOND PILE.

A shell of sheet steel of about ⅜ins. in thickness, and 12ins. in external diameter is coupled together in sections, these being joined by inside couplings. Within the shell reinforcing rods are inserted in sections, and are fastened together by a special mechanical device, so as to form practically a continuous rod. The shell is sunk first in the manner described for the foregoing piles that are cast *in situ*, but the means of driving is to use a pneumatic hammer together with a water jet. After the pile has been driven the earthy material within the shell is withdrawn and replaced by concrete in a similar manner to that previously described in connection with the other piles of this class. This particular pile has a large area of steel in its cross section, and in consequence the Building Department of New York City gives it a higher bearing value than any other, viz., 350 pounds per square inch on the concrete in compression, and 4,200 pounds per sq. in. on the steel. The life of the steel in the exterior shell is doubtful, as not only ground water may corrode the pile, but also any gas in the subsoil or stray electric currents may cause corrosion by electrolysis.

Up to the present we have only dealt with the forms of piles which are cast in a mould, and driven very much in the same manner as a timber pile. There is another type of pile which is formed *in situ*. In 1901, Mr. A. A. Raymond, of Omaha, invented this new form of pile. Briefly described, the Raymond system was to drive a tapering sheet steel shell or pipe to refusal by means of a collapsible steel core, and then to withdraw the core and fill in the shell with concrete. The sheath is expanded by means of a wedge driven at the centre, as shown in Fig. 5. When it is desired to withdraw the sheath, the wedge is pulled upwards so as to allow the core to collapse sufficiently to allow it to be withdrawn from the shell. The Raymond pile is tapering in shape. The steel shell prevents the earthy material from mixing with the concrete, this shell being left permanently in position. For driving the sheath, a heavy pile driver, usually mounted on a turn-table frame for facility of operation, is used. The core or sheath weighs about three tons. Before beginning operations the core is suspended in leads, with the point about 8ft. above the ground, to allow clearance for the section of casing to be slipped on. The casing is made from sheets of No. 20 U.S. gauge metal, 8ft. long, which are formed into the required shape, the edges being bent to connect together and retain the shape of a truncated cone. These are of various sizes to fit the tapering core, and are slipped on in regular order, with a considerable overlap to each section, enough sections being used to cover the core completely to the length required. Occasionally a joint between the sections is covered with an extra section, to make it tighter. When this is done, a pressed steel butt or thimble is forced on the point of the core, overlapping the last section of casing. The core is now ready for driving. It is slung back into the leads, lowered carefully to the proper location on the ground, and is then driven to refusal by a steam hammer weighing about three tons. When a core has been driven to the desired depth, it is collapsed and withdrawn, and the steel casing in the ground is immediately filled with concrete, proportioned, as a rule, about 1 part Portland cement, 2 parts sand, and 4 parts broken stone or gravel. The concrete cannot be put in place until the core has been withdrawn.

In practice it has been found that the shell, being made up of sections, is not tight, and water and quicksand enter. These have to be syphoned out before the concrete can be put in place. Sometimes it has been found that where the shells have been subjected to great hydrostatic pressure, the casing has sometimes collapsed and has had to be redriven. In other cases where hard driving into boulder formation has been resorted to the core has been so severely injured as to be put out of commission, and has had to be replaced. The pile tapers from 20ins. at the butt to 8ins. at the point, and it is claimed that its tapering shape distributes the load throughout the entire length of the pile, and compresses the soil to such an extent that the full bearing of the upper layers is utilised, while, also, the metal casing prevents the soil from mixing with and weakening the concrete.

In 1903, Mr. Shuman, at Philadelphia, invented a pile formed by a somewhat similar method, viz., in regard to its being made in place, but the details are very different. This pile is known as the "Simplex." In this case a hollow steel pipe, three-quarters of an inch in thickness of shell, and 16 ins. outside diameter, and of the same diameter throughout its length, is provided at the lower end with a special alligator jaw or shoe, which is closed during driving in order to prevent the entrance of the surrounding materials into the pipe. The jaw is securely attached to the pipe form by cable hinges, and is used over and over again. It is composed of two symmetrical wedge-shaped parts, which are kept closed during the operation of driving by the pressure of the earth. In harder soils, a detachable cast iron point is often used, but this is more expensive than the jaw point, as it has to be left permanently in place, and one point has to be supplied for each pile. The upper end of the pipe form is strengthened by a strong band of steel shrunk into place and firmly secured with countersunk rivets. This steel band also serves as a shoulder for the clamps which are attached to the piling device for withdrawing the pipe. A steel-driving head, sliding under the leads, with a circular projection on its lower face to fit into the top of the pipe form is lowered on to the form, and not only serves to hold the top of the form firmly in place during driving, but also receives the impact of the hammer, from which it is protected by a rope mat. The form is driven by an extra heavily built pile driver, which, in addition to the usual equipment, has a strong pulling device attached to the leads for the purpose of withdrawing the form after driving. When the pipe form has been driven to refusal, the driving head is hooked to the hammer by a wire attachment, and both are hauled to the top of the leads and attached there during concreting operations. A charge of concrete, consisting of about five cubic ft. is dropped into the form, after which the entire form is raised about a ft. by means of the pulling device. Then a heavy iron rammer is dropped on the mass, and by its impact opens the jaws and forces the concrete out into the space made by the end of the form. This procedure is repeated until the form has been entirely withdrawn from the ground and the space it occupies is completely filled with concrete, which hardens in place and becomes a concrete pile. This method of filling is varied to meet varying conditions. Occasionally, after the jaw has been opened, a sufficient quantity of concrete to make a complete pile is placed in the form, and the latter is steadily withdrawn. This plan, under certain conditions of the soil, gives a better shaped pile, because, under the first method, the jaws have a tendency to close partly, on account of the excess of pressure at the top of the form, thus making a pile of irregular section. This is avoided by giving a regular and steady movement to the pipe form.

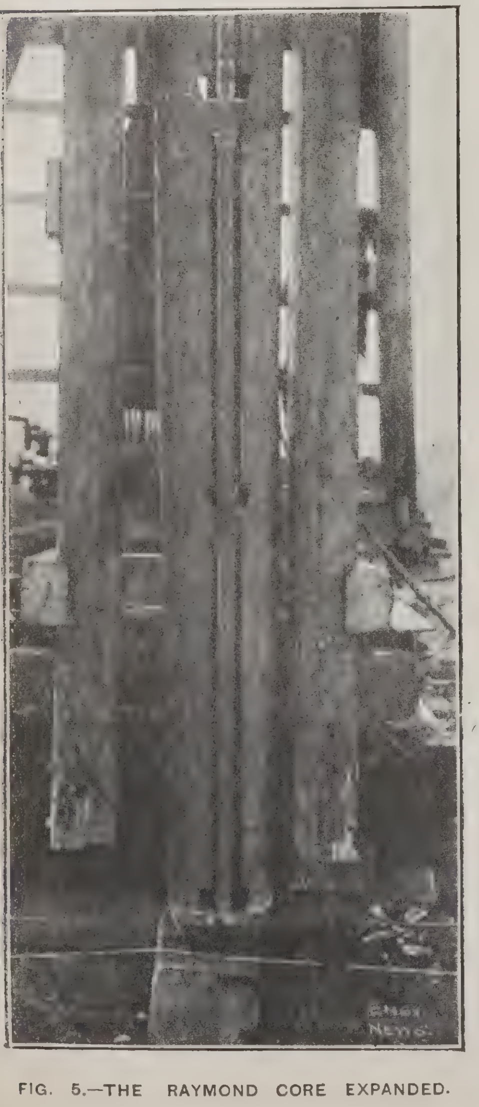


FIG. 5.—THE RAYMOND CORE EXPANDED.

A 1:2:4 mixture of concrete is usually employed, and the mixture is quite wet. When placed within the form in mass it is heavier than the surrounding soil, and thus it is more than able to balance the pressure, and the soil has no tendency to cut off any section of the pile, as the excess pressure serves to force the concrete into the soil. It has been found that with very hard driving, heavy forms, even with ¾in. shell, have been buckled at the top. It should be noted here that if a form of this nature is so injured, a timber pile in the same circumstances could never be driven, but would simply buckle up when a very short distance in the ground. In another case, where Simplex piles were used, a form was driven into the lower stratum so firmly that the pulling device could not withdraw it, so it had to be filled with concrete and left permanently in place. It is claimed for piles of this type that the fresh concrete which comes into direct contact with the surrounding soil, enters into all its irregularities and unites with it, thus forming a rough exterior surface which gives the pile a large amount of frictional resistance, while, further, as practically all the resistance to driving is confined to the point, the greater amount of the compression takes place where the pile needs it most in order to transfer its load as a column. A modification has had to be made in soils which were of a fluid or semi-fluid nature, as in that case the soil has not sufficient consistency to serve as a mould to retain the concrete in place. In one such case, after the driving form had passed through the soft strata and had driven to refusal into the firm underlying stratum, the initial charge of concrete was inserted and the point forced open; then an auxiliary form of No. 20 U.S. gauge metal, of slightly smaller diameter than the driving form, was dropped into place, and the required reinforcing was adjusted. Then the auxiliary form was completely filled with concrete, and the driving form was withdrawn, leaving the thin shell in position to act as a mould for the concrete. The length of piles of the ordinary type driven by the Simplex system is between 20 and 25ft., but piles up to 45ft. long have been successfully constructed. In both the Raymond and the Simplex piles a reinforcement of rods can be inserted. In the case of the Simplex pile the reinforcement has to be so arranged as to allow the rammer for the concrete to be dropped down, or it is possible to form the pile without the use of the rammer by employing a sloppy concrete which will pass readily down the form, and enter into all the parts of the reinforcement.

Also, in some cases, single rods have been pushed or churned into place through the wet concrete. Rods are usually left with their heads projecting above the concrete one foot or more, in order to assist the bonding of the capping to the piles.

One advantage of "made in place" piles over moulded piles is that as they harden in the place where they are to be used, a small foundation can be completed before the moulded piles would be ready to drive, thus effecting some small saving in time.

In the construction of the foundations of a garage at Albany, N.Y., an unpatented pile of this class was used, which serves to show one of its possible variations. The original surface of the site was a stiff clay, and had been covered to the depth of 15ft. by clay from adjoining excavations. Thus it was necessary to carry some of the load to the original surface. This was accomplished by excavating holes, 10ins. in diameter, through the overlying fill to the original surface, using a screw post-hole digger, and then filling the holes with fresh concrete, the clay filling being stiff enough to retain its position during the operation. The piles were spaced at 3ft. centres, two staggered rows being placed under the walls, while the pier-loads were supported by clusters similarly spaced. The total length of piles was 4,779ft.; the labour of digging the holes cost 20 cents per 1in. ft., and the concrete 7 dollars per cubic yard in place, or about 13 cents per 1in. ft., making a total of 33 cents per 1in. ft. of completed piles. In pile work there is usually quite a large charge for

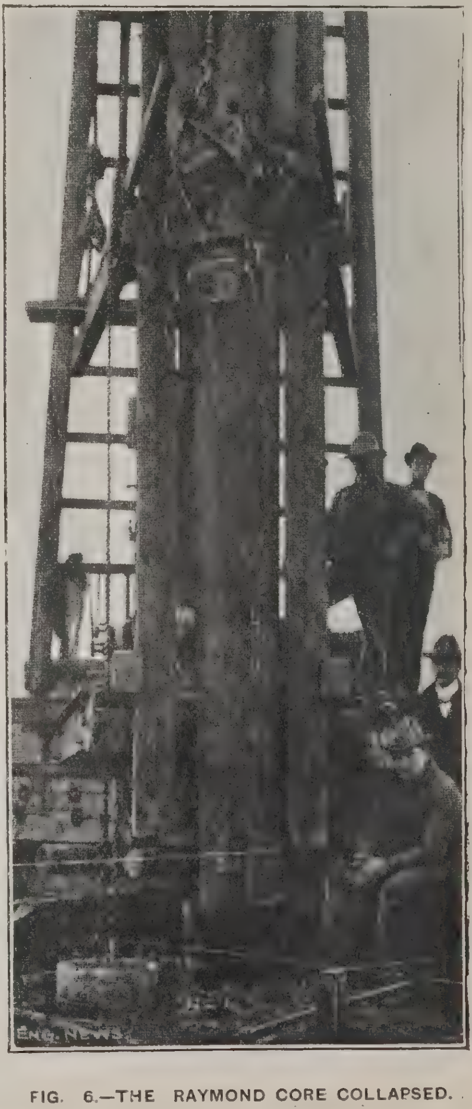


FIG. 6.—THE RAYMOND CORE COLLAPSED.

plant installation and dismantling; but in this instance this was reduced to a minimum, which accounts for the low unit cost. No compression of the pile-hole was made; but the supporting power of the pile was assisted materially by the capping, which acted as a spread footing.

Another type of this class has been used in the clay soils around Boston, Mass., where the clay was overlaid by some 20ft. of sand and silt. Through this an 8-in. casing was forced into the clay and the materials were washed out. Then a chambering device was used to expand the footing of the pile by cutting away the clay, which was also removed by washing. In this way the area of the footing of the pile was made sixteen times as great as that of the pile itself—a very effective method of obtaining a spread footing at considerable depth at a moderate cost. This type of pile has been patented.

Just previous to the construction of the pneumatic foundations of the Trinity-United States Realty Buildings, at Broadway, Cedar Street, and Trinity Place, New York City, the foundations of three columns of the Sixth Avenue Elevated Railroad, located on the kerb-line of the Trinity Place front, were carried to hardpan, 75ft. below the kerb, by using steel-encased concrete piles. This was done in order to avoid any possible settlement of the railroad structure during the sinking of the caissons, which were to be carried to bed-rock. The original piers of these columns were founded on the sand at about ground-water level, 12ft. below the kerb. Below this footing elevation there was a thick stratum of quicksand extending to the hardpan, the latter resting directly on the bed-rock. The transverse girder supported by the first column was shored up, and the column and its pier were removed and then restored completely before any work was done on the next column. Over the close-sheeted excavation made for the removal of the old pier there was used a short pile-driver which could be operated under the overhanging girder, and this was assisted by a water-jet, to force a 12-in. standard, black, wrought-iron pipe, in random-length sections, to the hardpan. When the first section had been worked down to the bottom of the sheeted excavation, another section was joined to it with outside couplings, the threads on the ends of the pipes being cut long enough to allow the ends of the sections to butt properly. The lower end of the bottom section was protected in most cases by an open driving-shoe, which made it easier to sink the pile-shell than with a cone-shaped, closed point, as it allowed the free use of the jet to soften up the material. The upper end of each section was protected from the direct impact of the hammer by a driving-head, which screwed into its coupling and butted on the pipe. This driving-head had a slotted opening in its side through which the jet was worked during the operation of the hammer. Most of the material from the inside of the pipe was removed by the jetting process; any that remained was taken out by an ordinary sand-pump. There was no difficulty in getting out all the material after the pipe had reached the hard-pan, the depth being checked by steel-tape measurements, and the interior of the pipe inspected by the aid of a lantern. The pipe was then filled with 1:2:4 concrete. Five piles were thus placed for each pier, one near each corner, and the fifth in their midst directly beneath the centre of the column. The piles extended 5ft. into the mass of concrete which formed the new pier, and was 8ft. square at the base, and stepped in to meet the column-base at the kerb-level.

A similar pile has been used in the underpinning of buildings in New York City. It is placed directly beneath the well by cutting in the latter a vertical opening, from the starting elevation and through the foundation courses, of sufficient width and depth to leave ample working space around the pipe. The sections are forced into the soil by hydraulic jacks assisted with water-jets, using the remainder of the wall for reaction purposes.

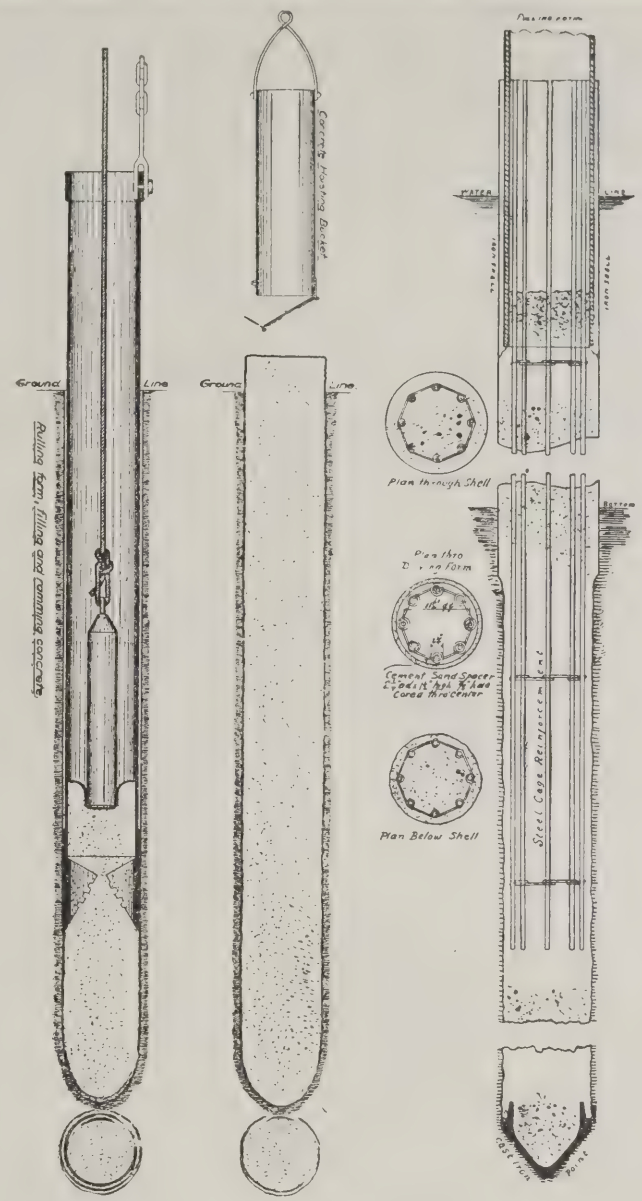


FIG. 7. DETAILS OE THE "SIMPLEX" PILE.

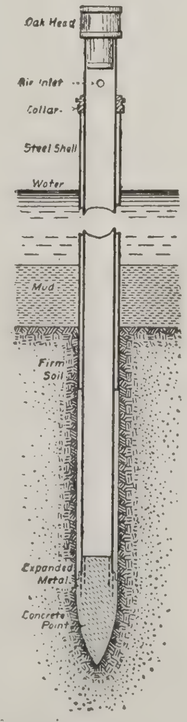


FIG. 8.—THE "SIMPLEX" FORM WITH CONCRETE POINT.

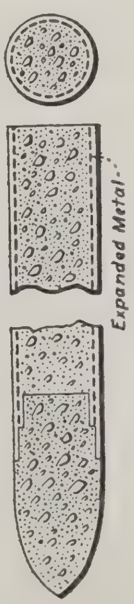


FIG. 9.—THE "SIMPLEX" PILE WITH CONCRETE POINT COMPLETED.

These piles are of various diameters, from 8ins. to 3ft., in proportion to the loads to be carried, and the spaces are cleaned out in a manner similar to that just described, except that the largest sizes, in which there is space enough for a man to work, are cleaned by hand. The spaces are then filled with concrete under air-pressure. When the pile is completed, the load of the building is transferred to it by masonry and wedging-stones. It is the most effective system of underpinning in use to-day, as it gives a positive assurance of the safety of the building, and at the same time does not occupy any space outside the wall; thus the contractor has a lot free from all obstructions.

Before driving piles it is very valuable, indeed, almost necessary, to ascertain in a practical way the bearing power of piles driven into the soil by an examination of the strata. Not only is it impossible to calculate the bearing power of piles without such information, but it is very likely that some modification or variation will be necessary in the form and construction of the pile to give good results. A very careful survey of the subterranean strata should be made by making test borings in various parts of the proposed sites. Though good wash borings are generally considered to furnish sufficient information, core borings are more reliable though somewhat more expensive. Where at all possible, it is most valuable to drive test piles, in which way the approximately correct depth necessary to drive piles can be determined, and the length of pile can therefore be specified; but, unless a pile driver can be obtained on the site, or can easily be placed thereon, such preliminary investigation by driving test piles is very expensive. With a job of any magnitude, however, economy will result in the end. Test borings should show the various strata, their thickness, etc., and the height of the sub-soil water. The strata will be of different thicknesses and height in different parts of the site, and the borings should provide all the information necessary to determine the length of the pile, the type of the pile to be used, and on which sub stratum to place the load.

The concrete pile, as we have stated before, develops a greater carrying capacity than the timber pile. Individual piles have been tested with pig-iron loadings of 45 tons and more without settlement, and piers of five piles have satisfactorily supported a test load of 300 tons, or an average of 60 tons per pile. In practice, however, it seems to be the custom not to load plain concrete to more than 25 tons per pile, but when reinforced to provide for excess loading, greater loads can with safety be carried. Timber piles of a comparable size would not be loaded to more than half of this amount, therefore the carrying capacity of the plain concrete pile is double that of the timber pile. Demonstrating the carrying capacity of concrete piles by means of an actual test loading, consisting in placing a platform on a pile and loading it with pig-iron to double the guaranteed load, and by means of a series of levels noting whether a settlement occurs, is thoroughly practical and satisfactory, but it is of a practical character only. In piling work it is very difficult to arrive at any theoretical rule that is at all satisfactory for general use. It seems to be the custom with those who have to deal much with piling work to solely rely on rule-of-thumb methods, and the results of actual experience in the driving of test piles. Attempts have been made to calculate the supporting power of concrete piles by the formulæ generally used with timber piles, but none of these formulæ seem to apply exactly, and they are still more inappropriate when the concrete pile is jetted into place. When driven into position, Ritter's formula, generally known as the Dutch rule, has been chiefly used The Ritter formula is:—

$$W=\left(\frac{b}{e}\right)\frac{Q^2}{Q+q}+Q+q$$

in which

W=the resistance to further penetration,

Q=the weight of hammer in pounds,

q=the weight of pile in pounds,

h=the height of fall in inches,

e=penetration in inches by the last blow.

This formula, however, only applies to a case where a pile has been driven, it does not help us to determine from the nature of the strata the approximate bearing power of the pile. Furthermore, as most reinforced concrete piles have to be driven with a dolly and cushion, the weight of the blow that comes upon the pile is very much less than that determined from the weight and drop of the hammer. A heavy ram with a short drop is not supposed to shatter the pile so much as a light ram with a long drop, and some of the best results seem to be obtainable with a 4 to 5 ton monkey, and a short drop that is reduced as the pile approaches its final position. In finding a formula to express the bearing power of a pile, many factors enter which are very difficult of determination, and also some which in practice will materially alter theory. For instance, the general assumption is that a small pile will go in easier than a large pile, but this is not true in the case of timber piles always, for the effect of the blow depends on the rigidity of the pile, thus a large pile is more rigid than a small pile, and consequently with the same weight of ram and the same length of drop a large pile will often penetrate much quicker than a small pile. Then there is the question of the friction of the pile against the ground. When piles are driven quickly the friction seems to be greatly overcome, and the pile will go in much easier and quicker than when the blows are not delivered so close upon each other. The penetration, therefore, under such quick driving, is more than can be obtained if the piles are allowed to rest for a time; the soil then sets round the pile and seems to grip it, so that a pile which showed considerable penetration at the last blow would, if allowed to remain for some time, not show any movement, or very little movement, under the same blow. Then, a rough pile will come to rest sooner than a smooth pile, and a pile that is out of the "true" also comes to rest sooner than a "true" pile. Again, a pile with a blunt shoe or without a shoe altogether, will also come to rest sooner than one with a sharp shoe. Square piles seem to penetrate easier than round piles in harder soils. To determine formula it has been suggested that to measure the skin friction the force required to withdraw the pile should be ascertained, but this, though it appears to be a useful suggestion at first sight, is really very inconclusive, because tests have shown that much greater force is required to withdraw a pile than to drive it. Another point of complication is the calculation of the resistance of a pile which is driven through a soft stratum into a hard one. The portion of the pile in the soft stratum acts as a long column unsupported, or at least slightly supported. Therefore lateral flexure has to be considered, and this induces shear stresses. These are also developed when the piles are united at the top by a decking, as in the case of a pier and vessels ride against that pier, applying impact stresses to the side of the piles and causing them to act as beams fixed at the ends. In other cases, too, piles have been used, as, for instance, at works in Southampton, to sustain retaining walls, and the pressure against these tends to shear the wall and its foundation from the piles.

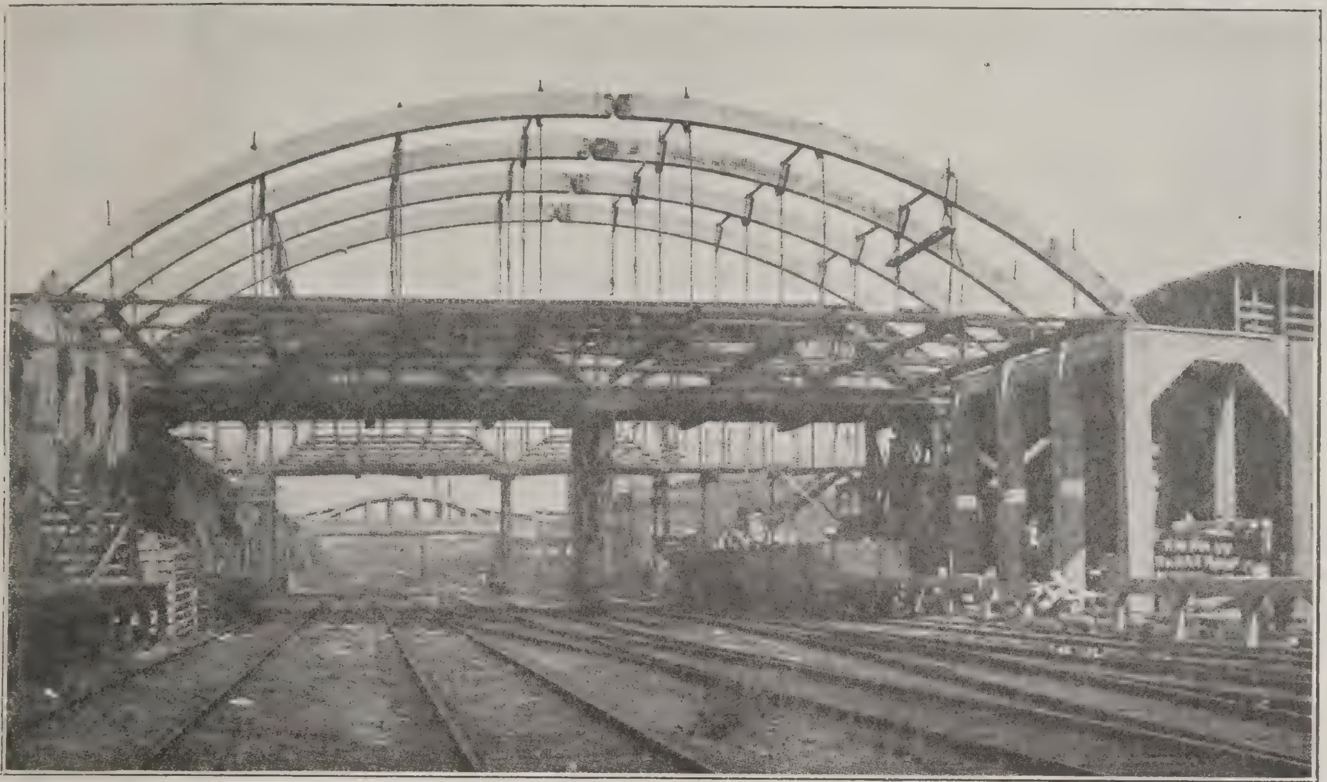
Considerable controversy has occurred respecting the merits of tapering piles versus straight piles. A tapering pile depends for its bearing power more on its shape and the skin friction thus developed than on its efficiency as a column, while a straight pile depends on the skin friction developed by its exterior surface and also on its strength as a column. As we have said, the amount of skin friction developed by any pile depends not only on the character of the surface, but also, we can add, upon the area of that surface.

Supposing we consider for the moment only the area. Taking two piles of equal length and having butts of the same size, one tapering to 6ins. at the point, while the other is straight throughout, it will be found that the straight pile has a larger surface area on which to rely for skin friction, and has a larger bearing surface at the point. Supposing, for instance, these piles measure each 14ins. at the butt, and are 20ft. long, the tapering pile will have a surface area of 52.4 sq. ft., as compared with 73.3 sq. ft. for the straight pile. The point area, too, of the tapering pile will be .2 sq. ft., while that of the straight pile is 1.07, the latter having almost 5½ times as much area available to transmit its load as a column, about 1.4 times as much superficial area, and 1.7 times as much volume, which also represents its displacement, the volume of the straight pile being 21.4 c. ft., while that of a tapering pile is only 12.6 c. ft. The table shows a further comparison that is instructive as regards the relative frictional values of the upper and lower parts. It will be seen that a tapering pile has a much larger proportion of its surface area in the upper than in the lower zone, which indicates that it must depend on the upper layers of the ground for the greater part of its supporting power, while the straight pile has its surface area uniformly distributed, and can utilise all the strata through which it passes. Thus it will be seen that 32.5 per cent. of the surface of the tapering pile is in the upper quarter, while only 17.5 per cent. is in the lower quarter. Supposing we take the safe load on firm gravel or clay to be 10 tons per sq. ft., and we assume that each pile is called upon to sustain a load of 20 tons, and that each has been driven to the firm gravel so that it can act as a column, then the tapering pile with only 2 sq. ft. of area at the point can only transmit as a column 2 tons, leaving the remainder of the load—18 tons—to be supported by skin friction, and about one-third of this would have to be supported by the upper strata. The straight pile, having 1.07 sq. ft. of area at the point, can sustain as a column 10.7 tons, leaving only 9.3 tons to be carried by skin friction, and about one-fourth of this, or two and one-third tons, would be supported by the upper strata, as against about six tons with a tapering pile. Where there is any likelihood of a scour on the bottom into which piles are driven, the tapering pile is at a still further disadvantage, for the scour of the current takes place at the top, at which point the tapering pile, as shown, concentrates so much of its resistance. Piles in such circumstances should be driven to firm bearing strata, and not reply on upper strata to support the load.

	Circumference in feet.		Super. Area of Zones in Square Feet.		Percentage o Zone Areas of entire Pile.	
	Taper.	Str'ht.	Taper	Str'gt	Taper	Str'gt
					per cent.	per cent.
Butt	3.665	3.665	17.020	18.325	32.5	25
One Quarter ..	3.142	3.665	14.400	18.325	27.5	25
One Half ..	2.618	3.665	11.780	18.325	22.5	25
Three Quarters.	2.094	3.665	9.160	18.325	17.5	25
Point	1.571	3.665				
			52.36	73.30	100	100

(To be concluded.)

Kirsch (Proceedings of the International Association for Testing Materials) reports that repeated loads of 1.2 kilos per square centimetre do not produce any alteration in the adhesion between iron and concrete, whether the latter be made of Portland cement or with slag cement. After fifty loads the adhesion of bright iron in Portland cement concrete (three months old) was 13.58 kilos. per square centimetre, as compared with an initial adhesion of 13.27 kilos., whilst with rusty iron the original adhesion of 8.78 kilos receded to 7.01 kilos. The loss of adhesion in the case of rusty iron was greater with slag cement, falling from 6.50 kilos. to 5.33 kilos. Expressed in percentages of the original adhesion, the diminution amounted to 4.5 with Portland cement and 15 with slag cement after one month, and to 27 and 27.7 respectively after three months.



THREE-HINGED CONCRETE TRUSSES: AN INTERESTING NOVELTY.

These trusses have been used at the yards of the Union Stock-yards and Transit Company of Chicago. The arch ribs were cast in two separate segments, and provided with hinges to form a three-hinged arch when placed in position.

THREE-HINGED CONCRETE TRUSSES.

During the past two years extensive reinforced concrete constructions have been carried on at the yards of the Union Stock Yards and Transit Company, of Chicago, Ill. Of the many structures, such as viaducts, bridges, platforms, and cattle pens, so far completed, the most interesting and unique in design and method of construction are a number of three-hinged arch trusses, which being so different from the ordinary reinforced concrete arches, a short description of them is of unusual intrest.

Three distinct designs, consisting of an ordinary Pratt truss of structural steel, a structural concrete girder, and a three-hinged segmental arch truss of reinforced concrete, were prepared by Mr. H. Milton Boyajohn, under the direction of Mr. Pierre Holmberg, consulting engineer, of Chicago. On account of the character of the work, and the conditions surrounding it, as well as the economy of cost, the latter design was adopted.

These arch trusses replace the old timber viaducts carrying a large traffic of cattle, sheep and hogs, which it was required to maintain without obstruction during the execution of the reconstruction. The old timber structures were not safe to support additional loads, and there was not room available for erection operations of any type of monolithic structure, and, in order to save a large expense which would have been involved by the reconstruction of new and removal of old timber viaducts, to shift the runs from their present position considerable pains were taken to develop in advance the details of a simple and economic method of executing the work rapidly and safely. All these requirements have been accomplished by an unusual system representing some interesting and ingenious features.

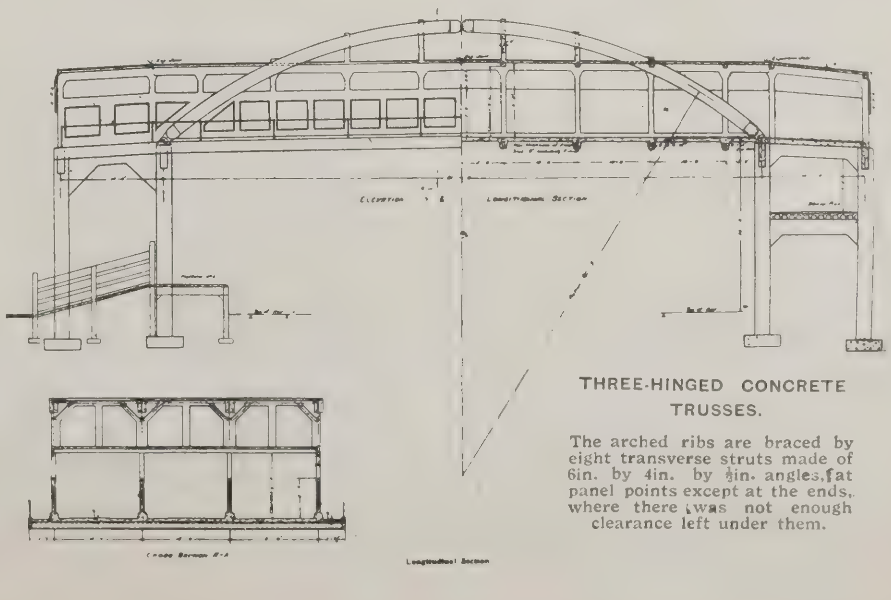
The prerequisite object of this design was to erect rapidly a self-supporting structure that could be utilised during the course of construction to take care of the movement of live stock, which had to be maintained continuously for an average of eight hours daily.

The arch ribs were cast in two separate segments, and provided with hinges to form a three-hinged arch when placed in position. The other members of the structure, consisting of lower chord tension bars, vertical suspension rods, transverse lateral bracings, and channel beams, were all of structural steel embedded in concrete afterwards. Although this is not a case where such a system was originally practised, it represents a distinct departure from the ordinary system of monolithic construction, with costly methods of centering, falsework, and forms, as well as the use of excessive concrete in building heavy abutments, into a recent and economic system of so-called piece construction with pre-made separate members, developed at the yards of the Union Stock Yards and Transit Company, and applied to various types of structures. Most of these viaducts were designed to span five parallel railroad tracks and two receiving platforms, 10ft. wide, one on each side of the tracks, making a clear span of 81ft., from centre to centre of bearings. Viaduct No. 1, which is already completed, consists of four segmental arch ribs of 15ft. 6in. rise, spaced 12ft. apart. Each rib is divided into two semi-ribs, and provided with cast-steel hinges, both at the crown point and the spandrels, making a three-hinged arch, as shown in the accompanying illustrations.

These ribs have a uniform cross section, 20 by 15ins. and are reinforced with four 2½ by 2½ by ¼in. angles, latticed together, forming a regular skeleton. The truss was designed to carry a live load of 100lb. per square foot, besides the dead load. The line of pressure of the equilibrium polygon resultant from the above loads follows closely the neutral axis, so that the rib is practically all in compression, the maximum unit stress in the concrete not exceeding 750 pounds per square inch.

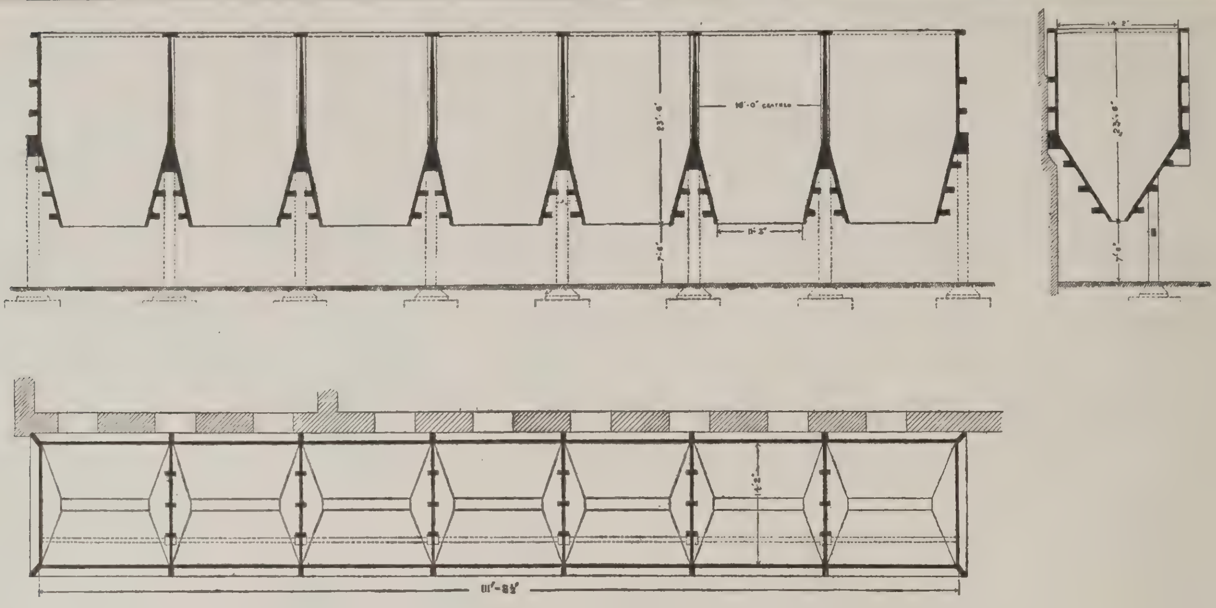
The concrete is made of 1:2:4 mixture, consisting of one part of Portland cement to two parts of torpedo sand to four parts of washed gravel, not exceeding ¾in. in size. Tests on similar mixture of concrete cast in our factory showed an average strength of 2,800lbs. per square in., on specimens from 60 to 90 days old.

Each rib is divided into nine panel points, symmetrical about the centre crown hinge, and varying from 11ft. at the centre to 5ft.



THREE-HINGED CONCRETE TRUSSES.

The arched ribs are braced by eight transverse struts made of 6in. by 4in. by ⅜in. angles, at panel points except at the ends, where there was not enough clearance left under them.



REINFORCED CONCRETE WASHERY BUNKERS.

These washery bunkers were executed for the Powell Duffryn Steam Colliery, South Wales, by Messrs. Heenan and Froude, of Manchester, on the Coignet system.

at the haunches. At the panel points, 2in. holes for the vertical suspension rods (1⅞in. diameter) are provided by placing 2in. gas pipes through the centre line of the rib. The upper end of the suspension rods is provided with upset thread, two nuts and 6 by 6 by 1in. washer which bears directly on the arch rib, and the lower end with an eye to engage the transverse floor girders consisting of two 10in., 15-pound channels. The 6in. floor slab reinforced longitudinally by No. 38 wire, and supplemented with ¾in. rods, is supported by these channel girders.

The bottom chords consisting of four 3 by 1in. eyebars with adjustable turnbuckles, were designed to take the horizontal component of the end truss of the arch. The concrete in which they are embedded afterwards is intended only as a stiffener and protection for the steel.

The arch ribs are braced by light transverse portal-like struts made of 6 by 4 by ½in. angles, at panel points except at the ends, where there was not enough clearance left under them.

All piers, which were constructed in place, consist of two rows of columns, 24ins. sq., having their centre lines 14ft. apart and connected at the tops by 12 by 24in. logitudinal and transverse beams with heavy brackets. Each row of columns rests on a sill, 12ins. deep, 5ft. wide, and 42ft. long, laid on firm clay foundation and reinforced heavily with ¾in. round rods.

The cost of form work, etc., was exceedingly small. Two men could easily arrange the forms, place the reinforcements and concrete two ribs in one day.

After allowing thirty days for the ribs to set, they were picked up by a derrick, loaded on cars, and switched out to the bridge site where they were placed in position by a derrick. Before setting these ribs in place, the lower cord eye-bars were placed from end to end pin. Finally the transverse portal struts, vertical rods and channel girder were placed in position. The old timber viaducts were then taken down and a temporary floor built in one of the runs to take care of the cattle movement, while the other two runs were being constructed. The forms for the rest of the structure were then rapidly constructed, all the reinforcement put in place, and concrete poured, care being taken to keep a continuous run of concrete until a point was reached where a good joint could be made. Provision was made for the rest of the viaducts to construct the floor in separate pre-made floor joists, cast in the factory.

The erection of the separate members of the structure was accomplished in six days, with a gang of ten labourers and a foreman, and concreting the floor, roof, girders, etc., was done in less than thirty days.

The structure has proved very satisfactory in all respects. Level readings taken at the centre of the lower cord as well as at the top of the crown with full live load in three runs, indicated ⅛in. maximum vibratory deflection.

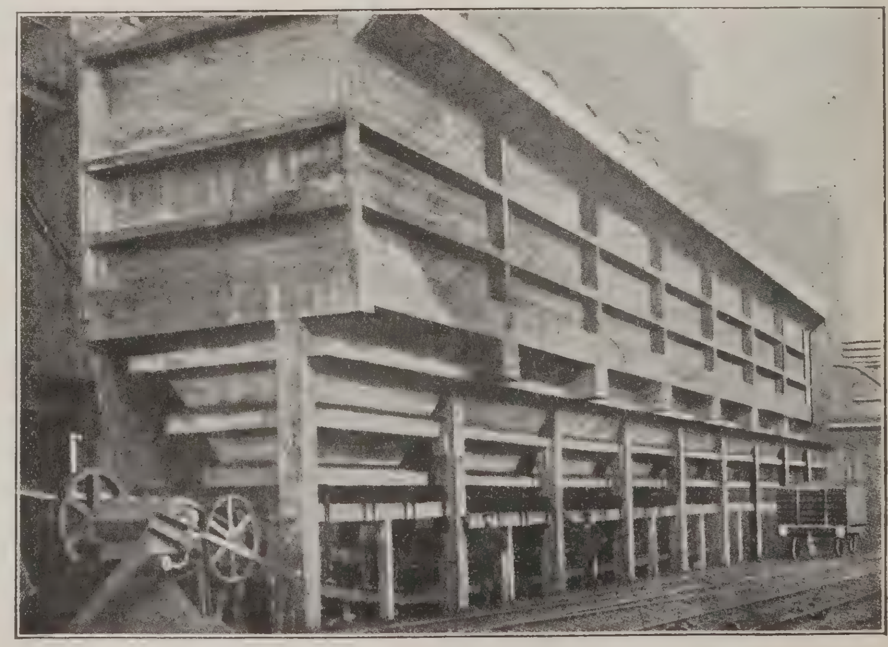
REINFORCED CONCRETE IN MINING WORK.

A small pamphlet has been published by Messrs. Edmond Coignet, Ltd., of 20, Victoria Street, which deals with the subject of reinforced concrete as it has been applied to mining and similar industries by the firm in question.

Reinforced concrete is finding its application in connection with mines in many ways, not only in respect of the construction of such structures as bunkers, water tanks, and foundations of engine houses, but for the construction of parts of the mining plant and outfit, as, for instance, in pit-heads, and pit-props, and also for the lining of shafts. From this small pamphlet we reproduce the accompanying illustration of washery bunkers, which were executed for the Powell Duffryn Colliery in South Wales by Messrs. Heenan and Froude, Ltd., of Manchester, licensed contractors on the Coignet system. In this particular work there were seven bunkers having a total length of 112ft. Each bunker measures 16ft. by 14ft. 2ins., and has a height of 23ft. 6ins. They contain water and coal dust, and it is possible to entirely fill any particular bunker in a few minutes. The cubic capacity of the seven bunkers amounts to about 27,000 cub. ft.

Our Plate.

"Great Roke," Witley, Surrey, is an admirable example of the excellent work of Messrs. Buckland and Haywood-Farmer. Additional charm is lent by the oriel windows. The rooms, it will be seen, are arranged in a most convenient order, several of the many difficulties invariably encountered in domestic work in which the area is at all extensive being very neatly solved.



REINFORCED CONCRETE WASHERY BUNKERS.

An interesting application of reinforced concrete. Each bunker measures 16ft. by 14ft. 2ins., with a height of 23ft. 6ins.

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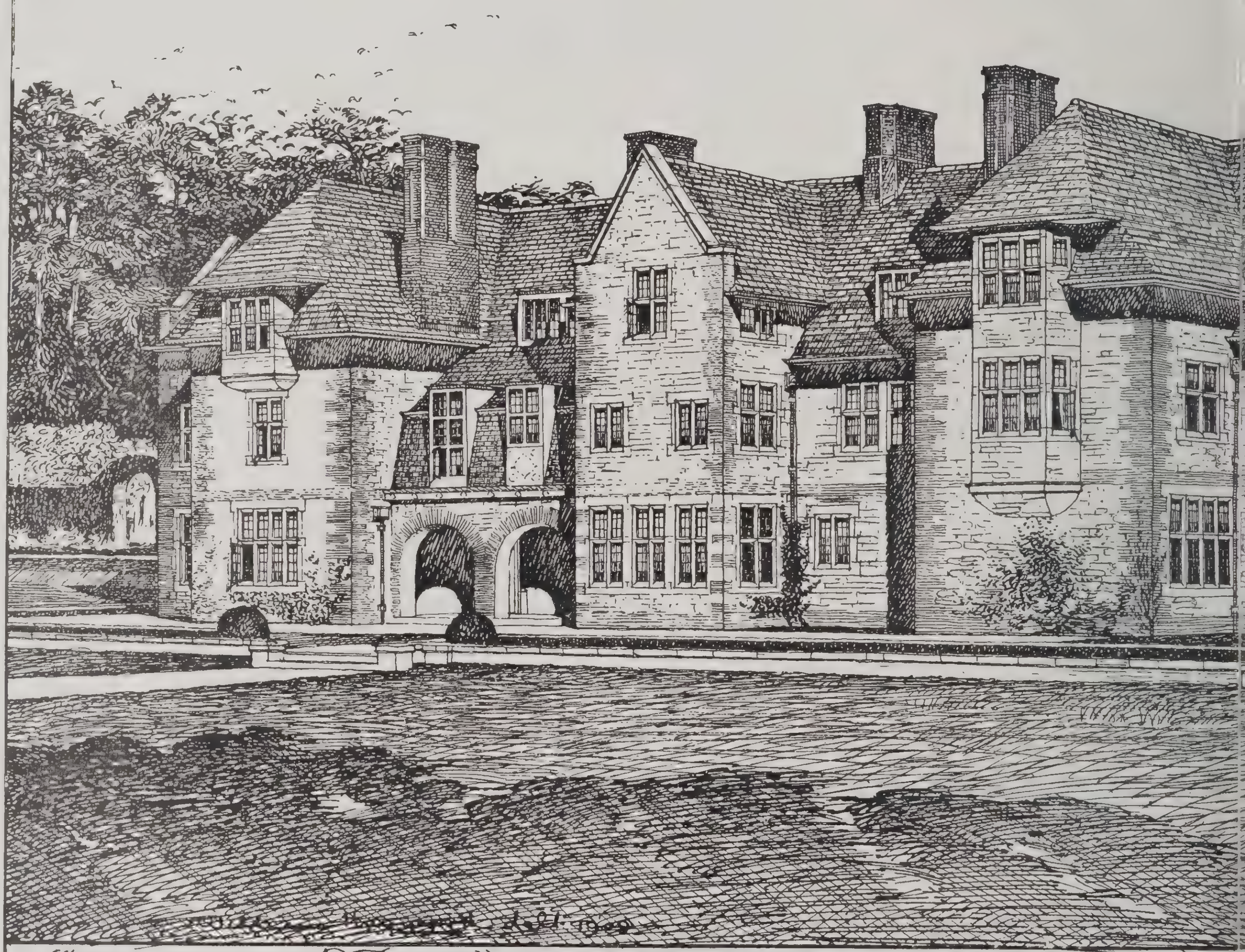

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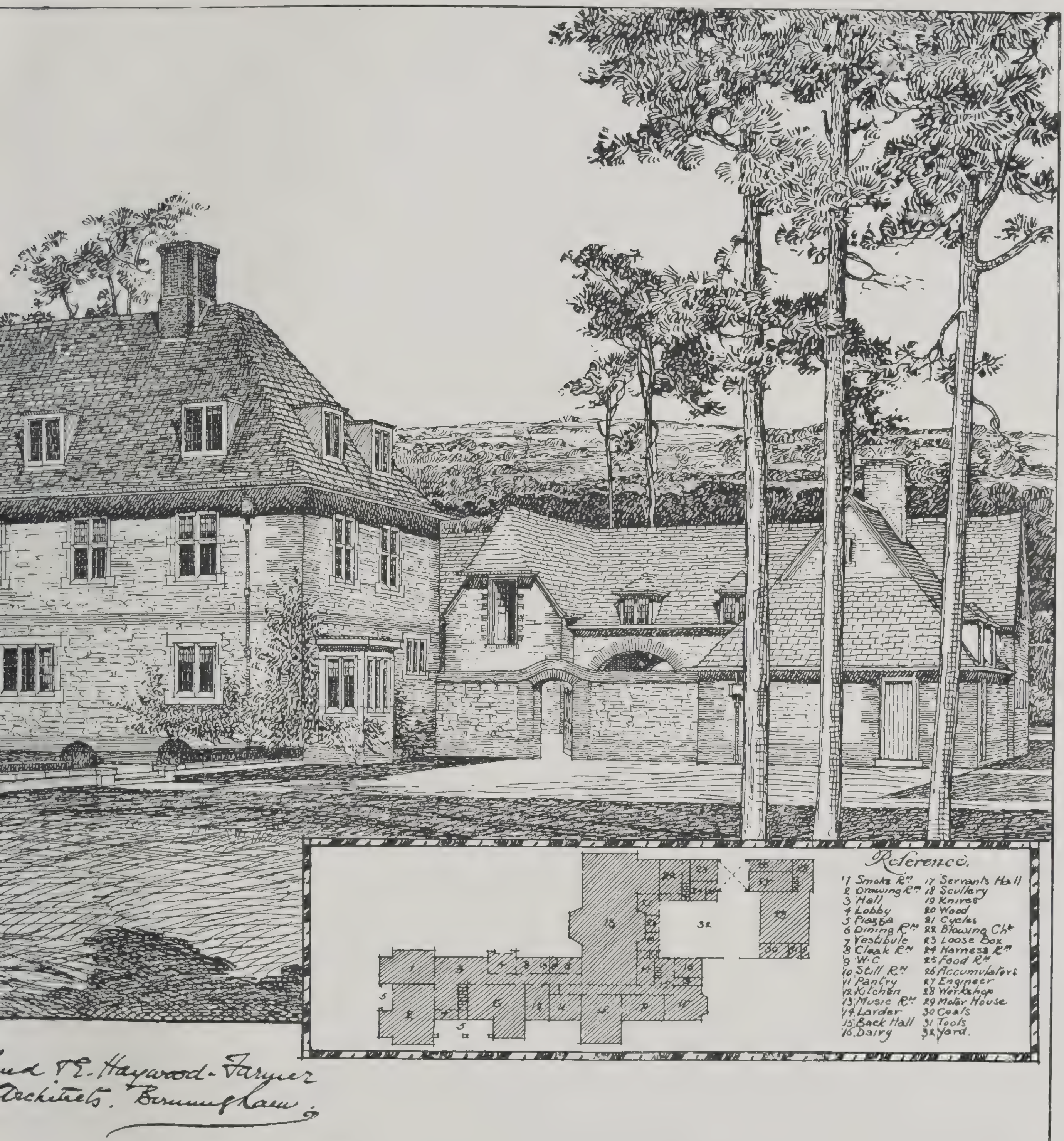

ud & E. Haywood-Farmer
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Trade and Craft.

Concrete Blocks and a Mixer.

The concrete block industry is growing in in this country, thanks to the "push" of enterprising manufacturers of machines for their manufacture. The concrete block, when properly made, is an economical building material, and also possesses good appearance and durability. Its cheapness, indeed, is not its sole merit, for it is lasting, and dwellings erected with such blocks are dry and sanitary, and warm in winter and cold in summer. Many builders and estate owners are now adding concrete blockmaking machines to their plant, and are finding them as serviceable in ordinary building operations in this country as they have been proved abroad, though, perhaps, the advantages they offer are not so great here as in an undeveloped country where other materials are expensive and difficult to obtain. There are various types of machines on the market. The "Winget" machine is one of the best. It comprises some novel features. Whereas most machines require the core forming the hollows in the block to be withdrawn by the operation of a lever, and the mould to be unclamped and turned down by hand, for the removal of the block, and the reversal of these operations to get the machine ready for making another block, the great feature of the "Winget" machine is that all is done by one operation, namely, pulling a lever. Pulled down, the block is released, put back, the mould is again ready for filling. This is time and labour economised and simplicity of action secured. Often several machines are needed to make the several kinds of blocks required, but not so with the "Winget" machine. It makes all sizes of blocks and specials from 32ins. by 16ins. by 9ins. downward. It makes hollow or solid blocks, and with division places can make 4 separate blocks at a time. It can be arranged to make specially moulded blocks by the insertion of different plates or cores. The machine consists of a mould box with hinged sides and ends carried in the frame hung in trunnions, with core blocks set inside. When the lever is pulled down, the bottom of the mould box, which is formed by a loose pallet inserted for each block, is lifted up, and at the same time the sides of the box fall outwards, leaving the finished block on the pallet ready to be carried off. The cores are carried on a fixed bed plate under the pallet forming the bottom of the mould box. Normally, in the side-face position, the machine can be used in the face-down position by swinging over in the trunnions the frame carrying the mould box into a horizontal position by means of the same lever, first releasing a stop. A minimum output of 200 blocks per day is guaranteed, but an average of 300 blocks have been turned out over a period of 3 months. The (U.K.) Winget Concrete Machine Co., Ltd., of Star Buildings, Northumberland Street, Newcastle-on-Tyne, also supply a concrete mixer known as the "Express." This consists of a sort of mortar mill pan with plough blades on axis within to mix the material. It is a batch mixer, and contains few working parts (and these are easily got at) to require renewal or repair. The material can be seen as it is being mixed, and this is an advantage as regards securing uniformity of output and thorough mixing of concrete.

Lifts at the New Strand Palace Hotel.

This new hotel is being fitted with a very complete system of elevator service by Messrs. R. Waygood and Co., Ltd,. London. There are two main passenger lifts, each capable of carrying a load of 10 cwts., or 7 persons, at a speed of 300ft. per minute. One of these lifts is worked by hydraulic power from the high pressure main of the London Hydraulic Power Co., and the other one by electric power, the latter being arranged with winding gear and special electrical control with car switch in the cage. Special electrical indicators are also fitted on each lift, showing the position of each lift at every floor by means of ornamental fitting with electric light. The cages are handsomely finished and decorated, and are provided with special safety apparatus to prevent the descent of cage in case of suspension ropes failing, also with safety appliances to guard against over travel in either direction. There are two goods lifts travelling up through the building, one operated by hydraulic power, and capable of carrying loads of 15 and 20 cwts. and one direct acting platform lift, from basement to ground floor. There is a very complete installation of electric service lifts—15 in number—serving the various floors. There are also three small hand-power lifts, for carrying wine and papers respectively.

Federation News.

South Western Federation: Half-yearly Meeting.

The half-yearly meeting of the South Western Federation was held at the Guildhall, Small Street, Bristol, on August 6th.

The half-yearly report was read by the secretary and adopted.

The treasurer presented his half-yearly statement and report, which was regarded as being very satisfactory, and was adopted.

A discussion took place as to the recommendation contained in the report with regard to apprentices, and the secretary was instructed to write to the local association and impress upon them the advantages to be derived by the employers in increasing their number of apprentices.

The question of sending in bills of quantities with tenders was discussed, and it was pointed out that the practice in this Federation, except in regard to the case of engineers, was that the bills of quantities were not opened unless the tender was accepted.

Mr. George Hayward (Bath) brought forward the question of the amount for which an estimate should be given without quantities being supplied. He pointed out that it varied in different towns in the Federation, and might lead to some friction.

It was arranged that a conference on the matter should take place between Bristol and Bath Associations.—W. F. Long, secretary, Northumberland Buildings, Queen Square, Bath.

BARROW-IN-FURNESS ASSOCIATION.

Secretary: J. Baker.

The monthly meeting of the Association was held on Tuesday, August 31st, and was well attended.

The secretary reported as to correspondence *re* the appointment of a teacher for the proposed plumbers' class in connection with the Borough Technical School, and approval was given to the appointment of Mr. Nichols, bronze medallist. It was also resolved to encourage the apprentices to attend the classes by additions to their wages in the event of their winning 1st and 2nd class prizes, and if attendance had been satisfactory.

In order to stimulate attendance of members at the monthly meeting of the association, it was resolved to inflict a 1s. fine on all who do not attend one meeting in a quarter.

Approval was given to the draft of a letter to be sent to the Town Clerk respecting the arbitration clause inserted in all the corporation contracts, such clause setting for the borough engineer as sole arbitrator, the judge in a recent case having given judgment against it.

MIDDLESBROUGH ASSOCIATION.

Secretary: Walter Rigby.

The monthly general meeting of the Middlesbrough Association was held in the Corporation Hotel, on Wednesday, September 1st.

The president (Mr. W. Masters) presided over a fair attendance of members.

It was reported that the conference between the Executive Committee representing the Teesside Federation of Master Builders and the representatives of the employees connected with the different branches of the building trade in this district, *re* uniformity of working hours, had come to nought owing to a condition put forward by the employees that one of the branches concerned should receive increased wages as an equivalent for a reduction of hours worked in order to secure uniformity. The Federation found it impossible to agree to this, and the conference was immediately adjourned.

At a previous meeting, Mr. P. Bray drew attention to a new order issued by the borough surveyor of this town, in reference to the height of a ceiling in a back bedroom, carried over a scullery. He further explained that up to a short time ago, Middlesbrough builders had been in the habit of putting on the wallplate at 7ft., ceiling up the spar, fixing the ceiling joists across at 9ft., and calling it a room "partly in the roof," as per by-law. This had been the custom since the by-laws came into force in 1901. Recently a new surveyor had come to the town, and a change is to be made. He advises the Plans Committee that the above is not a room "partly in the roof," with the result that the Corporation now decline to pass any plans unless the back rooms are shown to be 9ft. at the eaves.

This change was felt by the meeting to be a very serious matter, especially to speculative builders. But before taking the matter up with the Corporation the secretary was instructed to write other towns for information as to the working of the by-law in their districts.

The report of our representative (Mr. W. Masters) to the National meeting at Portsmouth was received and adopted. Mr. Masters was heartily thanked for a detailed and very interesting report of those meetings.

The president spoke strongly of the advisability of each member of this association becoming a subscriber to the "Builders' Journal," and advocated the policy of the Sunderland and the Oldham Association in this matter, viz., part subscription paid by member and part by the association. The secretary was instructed to place the matter upon the agenda of a later meeting, as it was felt that an expression of opinion upon this question from the whole of the members was desirable.

Correspondence from the Northern Counties Federation, *re* "Fair Wages Clauses in Contracts," and "Comparative Statement of Hours and Wages," was read.

It was decided that the smoker postponed in April last till later in the year be held at the close of the next monthly meeting in October in the Corporation Hotel, and a committee was appointed to make the arrangements.

WARRINGTON AND DISTRICT ASSOCIATION.

Secretary: Bertram B. Moss.

Several months ago, the Warrington Association served notices upon the operative bricklayers and operative joiners of Warrington for a decrease in wages of ½d. (halfpenny) per hour, and slight alteration to the boundary and other rules. A counter-notice was received for an advance of ¼d. per hour (one farthing) and slight alteration to the rules from both trades. After lengthy negotiations, the following settlement has been arrived at:—Wages to remain as at present, viz., 9¼d. (ninepence farthing) per hour with regard to both trades; in the case of the bricklayers, a slight reduction in the winter hours, and in the case of the joiners a slight reduction in both summer and winter hours; also other minor alterations to the rules.

The Lancashire, Cheshire, and North Wales Federation have forwarded their "Half-yearly Report, List of Members, and Year Book," compiled by Mr. Robert Hall, Cromwell Buildings, Blackfriars, Manchester. We hope to deal with it next week.

COMPLETE LIST OF CONTRACTS OPEN.

In this list are included, as a rule, only those contracts for which tenders are returnable about **five days** after the date of this issue.

Unless expressly stated to the contrary, all deposits required for bills of quantities, etc., are returned ontreceipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the Contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Sept. 17—27. **FERMOY (Ireland).**—Erection of 12 "A" married soldiers' quarters, Fermoy, Ireland. Plans, specification, and conditions of contract may be inspected at the office of the Director of Barrack Construction, 80, Pall Mall, London, S.W., or at the Barrack Construction Office, Fermoy, Ireland, on Monday, Tuesday, and Wednesday, September 13th, 14th, and 15th, 1909. Those desiring to tender and to receive a copy of the bills of quantities must apply to the Director of Barrack Construction not later than Friday, September 17th, 1909. The application must be accompanied by a deposit of 10s., which will be returned if a bona-fide tender is received from the applicant. Cheques or orders to be made payable to the Assistant Financial Secretary and crossed "Bank of England for Credit to Army Funds." Tenders on the form supplied with the bills of quantities, must be delivered in sealed envelopes, marked "Tender for 12 'A' Married Quarters, Fermoy," not later than 12 noon on Monday, 27th September, 1909, addressed to the Director of Army Contracts, War Office, Whitehall, London, S.W. The bills of quantities should accompany tender in a separate sealed envelope, similarly addressed and marked "Bills of Quantities, ———," with the contractor's name and address thereon.—H. de la Bere, Director of Army Contracts, War Office, Whitehall, London, S.W.

Sept. 18. **SUNDERLAND.**—Erection of proposed new stables and carpet-beating shed, etc., High Barnes Terrace, for the Grange Laundry Co. Plans may be seen, and quantities obtained at the office of the Architects, 20, Fawcett Street. Tenders, sealed and endorsed, to be delivered to Wm. and T. R. Milburn, FF.R.I.B.A.

Sept. 18. **AYLESBURY.**—Effecting sundry internal alterations at the Judges' Lodgings, Aylesbury, for providing offices upon the upper floor, for the Bucks County Council. Plans and specification may be seen, and form of tender obtained, at the office of R. J. Thomas, county surveyor, County Hall, Aylesbury, where sealed tenders are to be delivered.

Sept. 18. **GLAMORGAN.**—Erection of a County Hall in the Cathays Park, Cardiff, upon foundations which have already been laid, for the Glamorgan County Council. Plan and specification and form of contract may be seen, and copies of the bills of quantities obtained (on payment of a deposit of two guineas, which will be returned after receipt of a bona-fide tender, according with the particulars and conditions laid down), at the office of the Architects, Messrs. Harris and Moodie, 8, New Square, Lincoln's Inn, London, W.C. Tenders made out on the forms supplied and securely sealed in the envelopes supplied with the quantities are to be delivered here on or before Saturday, 18th September.—T. Mansel Franklen, Clerk of the County Council, Glamorgan County Council Offices, Westgate Street, Cardiff.

Sept 20. **NEWPORT (Mon.).**—Necessary work in connection with the pulling down of the existing bridge at Pontllanfraith, and the erection of a steel structure, for the C.C. Plans and specifications may be seen at the office of William Tanner, F.S.I., County Surveyor, and a copy of the quantities obtained on deposit of £1 1s. Tenders to be sent to the County Surveyor.

Sept. 20. **CAMBRIDGE.**—Erection of additions to the sewage pumping station, Riverside, Cambridge, according to plans, etc., prepared by the Borough Surveyor, for the Corporation. Plans and specification may be seen at the Office of the Borough Surveyor, Guildhall, where other particulars and form of tender can be obtained. Tenders to be sent to J. E. L. Whitehead, Town Clerk, Guildhall.

Sept. 20. **HAVERFORDWEST.**—Erection of 14 brick-built houses at Prendergast, under the Provisions of the Housing of the Working Classes Acts. Plans may be inspected and copies of the specifications obtained at the Borough Surveyor's Office, Council Chambers, Haverfordwest. Tenders sealed and endorsed "Tender for Houses," must be delivered to the undersigned not later than noon on September 20th.—R. T. P. Williams, Town Clerk.

Sept. 20. **LAURENCEKIRK.**—Works to be executed in the construction of new station buildings at Laurencekirk, for the Caledonian Railway Co. Drawings may be seen at the office of the Company's Engineer, Buchanan Street Station, Glasgow, where copies of the specification and schedule may be obtained on deposit of £2 2s. Tenders to be lodged with J. Blackburn, Secretary, Caledonian Railway Company's Offices, 302, Buchanan Street, Glasgow.

Sept. 20. **SMETHWICK.**—Erection of various buildings at the depot in Rolfe Street, Smethwick, for the Corporation. Plans and specifications can be seen, and bill of quantities obtained, at the office of the undersigned. All applications for quantities must be accompanied by cheque deposit of £3 3s. Tenders to be sent in under seal, addressed to the Chairman of the Public Works Committee, and endorsed "Tender for Depot," and delivered to C. J. Fox Allin, Borough Surveyor, Council House, Smethwick. Fair wages clause.

Sept. 20. **WEARDALE.**—Erection of three stone bridges on the road from Eastgate to Rookhope, for the R.D.C. Plans may be seen and specifications and forms of tender and other information may be obtained on application to G. W. Egglestone, the Highway Surveyor, at his office at the Board Room of the Guardians in Stanhope. Specifications and forms of tender on deposit of £1. The bridges will be let together or separately as the District Council may think fit. Tenders should be sent to F. H. Thompson, Clerk to the District Council, Stanhope.

Sept. 20. **ADLINGTON, LANCS.**—The Lancashire Education Committee are prepared to receive tenders for the erection of a new elementary school for 352 scholars and a manual instruction and cookery block, at Adlington, near Chorley. Plans may be seen and bills of quantities obtained at the office of the County Architect, Mr. Henry Littler, 16, Ribblesdale Place, Preston, by payment of a deposit of £2 (which will be returned upon receipt of bona-fide tender). Tenders must be delivered by first post on Monday, Sept. 20th, sealed and endorsed, to "B. Stanton, Esq., High Street, Chorley."—Harcourt E. Clarke, Clerk to the Lancashire County Council, County Offices, Preston.

Sept. 21. **ABBERTON.**—Building a new bridge at Abberton, for the Lexden and Winstree Rural District Council. Plans and specifications can be seen by appointment at the office of John Ennals, Surveyor, Lexden. Tenders, endorsed "Abberton Bridge," to be sent to Chas. H. Tompson, Clerk to the Council, Victoria Chambers, Colchester.

Sept. 21. **BRISTOL.**—Execution of builder's, plumber's, and electrician's work connected with the erection of a Council school at Alexandra Park, Fishponds, for the Bristol Education Committee. Drawings, specifications, and general conditions of contract may be inspected, and on deposit of £2 2s. forms of tender and bills of quantities may be obtained at the office of the Architects, Rodway and Dening, Gaunt House, Orchard Street, Bristol. Tenders to be sent to Wm. Avery Adams, Secretary, Guildhall, Bristol.

Sept. 21. **GREENOCK.**—The School Board invite tenders for (1) digger, mason, and brick works; (2) carpenter, joiner, and ironmongery works; (3) plumber work and gasfittings; (4) slater work; (5) plaster work; (6) glazier work; (7) painter work; (8) furnishings, required in connection with the addition and alteration to Greenock Academy, according to plans by Boston, Menzies and Morton, Architects, Greenock. Schedule of quantities and form of tender can be obtained on application to the undersigned on payment of a deposit of one guinea for each schedule, which amount will be returned on receipt of a bona-fide tender. Sealed tenders on the prescribed form must be delivered to A. F. Niven, Esq., Clerk to the Greenock Burgh School Board, Municipal Buildings, Grenock, not later than 11 o'clock a.m. on Tuesday, 21st September, 1909.

Sept. 21. **DURHAM.**—Erection of new council schools at Wingate and Cold Hesledon; alterations and additions at Dean Bank, New Penshaw, and Westwood Council Schools, for the C.C. Sole tenders are invited. Plans, specifications, and general conditions may be seen, and bills of quantities obtained as follows:—1, for Wingate School (300 scholars), at the office of W. Rushworth, Shire Hall, Durham; 2, for Cold Hesledon School (264 scholars), at the office of J. W. F. Phillipson, Murton Chambers, 8, Grainger Street, Newcastle-on-Tyne; 3, for Dean Bank School, at the office of T. W. T. Richardson, 57, High Street, Stockton-on-Tees; 4, for new Penshaw and Westwood Council Schools (plans, specifications, and general conditions only), at the office of F. E. Coates, Shire Hall, Durham. Tenders are to be sent to A. J. Dawson, Clerk to the Education Committee, Shire Hall, Durham.

Sept. 22. **NEWCASTLE (Co. Down).**—Enlarging and remodelling the Church of Our Lady of the Immaculate Conception, Newcastle, Co. Down, for Rev. James M'Ilvenny, P.P. Copies of the plans and specification can be obtained from J. J. M'Donnell, Architect, 27, Chichester Street, Belfast, to whom sealed and endorsed tenders are to be sent.

Sept. 22. **ILFRACOMBE.**—Erection of business premises, the Promenade, Ilfracombe, for T. D. Harding. Drawings and specifications may be obtained at the office of Allen T. Hussell, F.R.I.B.A., Market Square, Ilfracombe, to whom tenders are to be sent.

Sept. 22. **BLACKPOOL.**—Erection of the new central library and new art gallery, Blackpool, for the Corporation. Names and addresses, together with deposit of £2 2s., to T. Loftos, Town Clerk. Quantities can be obtained on Sept. 8th, on application to the Town Clerk, to whom tenders must be sent.

Sept. 22. **FULHAM.**—Alterations to Wharf, and additions to wharf-keeper's house, at Swan Wharf, Putney Bridge. Particulars from the Borough Engineer and Surveyor, Town Hall, Fulham. Tenders to be delivered by 4 p.m. on Wednesday, September 22, 1909. — J. Percy Shuter, Town Clerk, Town Clerk's Office, Town Hall, Fulham, S.W.

Sept. 22. **ANGLESEY.**—Additions and alterations to the Council School at Bodedern, Anglesey. Plans, etc., may be inspected at the above school. Tenders, sealed and endorsed "Bodedern School Tender," to be sent in to R. H. Williams, Secretary of Education, Education Offices, Llangefni. Forms of tender will be supplied on application to the Schoolmaster, Bodedern.

Sept. 22. **LONDON, S.W.**—Decorations and repairs to the underground convenience at Gibbs Green, West Kensington, and the urinal at Putney Bridge, also carrying out certain alterations to wharf and additions to wharf-keeper's house at Swan Wharf, Putney Bridge, for the Metropolitan Borough of Fulham. Separate forms of tender, specifications, and other particulars for the above works may be obtained on application to the Borough Engineer and Surveyor, Town Hall, Fulham. Tenders must be sent to J. Percy Shuter, Town Clerk, Town Clerk's Office, Town Hall, Fulham, S.W.

Sept. 23. **SWANSEA.**—Erection of an electric power station on the eastern side of the Prince of Wales Dock Lock, for the Swansea Harbour Trustees. Drawings and specification may be seen and form of tender obtained at the office of the trustees' engineer, A. O. Schenk, M.I.C.E., Harbour Offices, Swansea. Tenders should be delivered to Talfourd Strick, Clerk, Harbour Offices, Swansea.

Sept. 23. **MAIDSTONE.**—Erection of an isolation hospital on a site situate adjacent to Well Street in the parish of Loose, near Maidstone, for the R.D.C. Plans and specification and bills of quantities and form of tender at the office of Ruck and Smith, Architects, 86, Week Street, Maidstone, on deposit of £1 1s. Quantities, etc., may be obtained on or after Sept. 13. Tenders on form supplied, to be delivered to Robert Hoar, Clerk, 9, King Street, Maidstone.

Sept. 23. **LEEDS.**—Contractors desirous of tendering for any of the trades required in the erection of boys' and girls' departments at Kirkstall Road Council School, are requested to apply to the Education Department (Architect's Section), Calverley Street, Leeds. Tenders to be delivered not later than 10 a.m. on Thursday, September 23, to the undersigned, endorsed "Tender for Kirkstall Road Council School."—James Graham, Secretary for Education, Education Office, Leeds.

Sept. 23. **TUNBRIDGE WELLS.**—The Commissioners of H.M. Works of Public Buildings are prepared to receive tenders for the extension of the Post Office, Tunbridge Wells. Drawings, specification, and a copy of the conditions and form of contract may be seen on application to the Postmaster. Bills of quantities and forms of tender may be obtained at the undermentioned address on payment of one guinea. The sums so paid will be returned to those persons who send in tenders in conformity with the conditions specified below. Tenders must be delivered before 11 a.m. on Thursday, 23rd September, addressed to The Secretary, H.M. Office of Works, etc., Storey's Gate, London, S.W., and endorsed "Tender for Tunbridge Wells Post Office Extension.

(Continued on page xxiii.)

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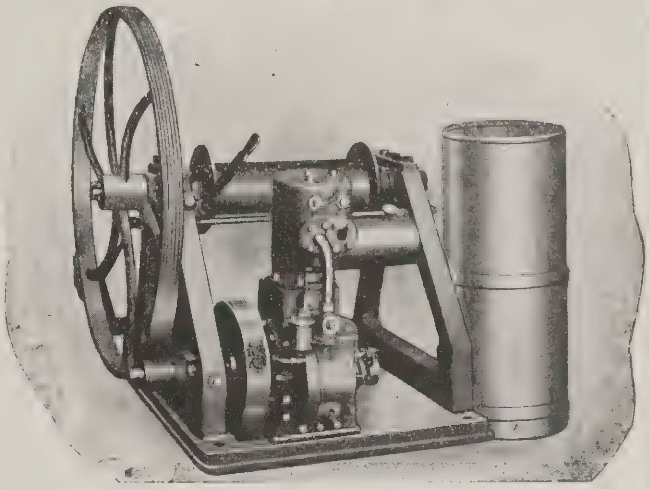

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Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

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A. H. Ball and Co., Farnham	2,768	2	7
Fulford and Crow, Farnham...	2,633	13	0
A. Wilcox, Tongham	2,574	13	2
J. C. Trueman, Ltd., Swanley	2,519	16	6
W. H. Wheeler and Co., Ltd., London	2,388	19	0
T. C. Starkey, Hull	2,379	0	8
M. Wells and Co., Aldershot ...	2,106	10	8
G. A. Franks, Guildford ...	2,089	6	6
G. Kemp and Co., Aldershot...	2,034	0	0
Ripley, Strong and Co., Farnborough	2,018	9	8
W. Norris, Upper Hale* ...	1,990	7	6

Surveyor's estimate, £2,518 3s. 11d.

*Accepted subject to Local Government Board sanction to loan.

Aylesbury.—For erecting and completing new stables, stores, sheds, etc., for the Urban District Council. Mr. W. H. Taylor, Council surveyor. Quantities by architect:—

E. H. Gibson and Sons, High Wycombe	1,747	0	0
J. Honour and Sons, Tring ...	1,749	0	0
R. Jewell and Sons	1,796	15	6
W. G. Stone, West Drayton...	1,830	0	0
Mayne and Son	1,898	0	0
Bosworth and Lowe, Nottingham	1,922	15	0
J. Moseley, London	1,925	0	0
W. Y. Green and Co.	2,143	10	0
A. H. Fryd, Southend-on-Sea...	2,187	0	0
Webster and Cannon, Cambridge Street*	1,668	0	0

*Accepted.

Fareham (Hants.).—For erection of a house at Fareham. Messrs. Hall, Pain, and Goldsmith, 48, West Street, Fareham, architects. Quantities by Mr. C. W. Ball, Whittington Chambers, King's Road, Southsea:—

R. Scammell, Bishop's Waltham	£1,581	0	0
Chance and Sons	1,422	7	0
C. Wright, Lee-on-the-Solent	1,408	16	4
J. Hunt, Gosport	1,406	0	0
W. T. Dugan, Portsea	1,378	6	6
F. A. Lane, Gosport	1,338	0	0
F. J. Privett, Southsea	1,305	0	0
H. Buckett, Drayton, Cosham	1,300	0	0
E. Willcox	1,285	0	0
W. G. Latty	1,250	0	0
H. Plummer	1,250	0	0
Glover and Son	1,246	0	0
T. Draper,* Deane's Park Road	1,209	0	0
A. J. Fry	989	0	0

Rest of Fareham.

*Accepted.

Halsted (Essex).—For erecting elementary school, for the Essex Education Committee. Messrs. Goodey and Cressall, St. Peter's Chambers, High Street, Colchester, architects. Quantities by Mr. J. Sydney, Parmenter, Chelmsford:—

A. J. Suckling	£6,482
E. Saunders	5,910
Dowsing and Davis	5,500
G. Grimwood and Sons	5,497
Z. Rogers	5,284
W. Bell and Sons	5,216
R. Shanks	5,175
W. C. Theobald	5,115
F. and A. Willmott	5,091
S. A. Kenny	5,085
J. S. Hammond and Sons	5,081
A. E. Farr	5,068
T. Parkington and Son	5,000
Kerridge and Shaw	4,998
H. Smith	4,997
H. J. Linzell	4,997
G. Sharp	4,988
H. Everitt and Son	4,978
G. Dobson and Son	4,958
Clark and Sons	4,949
A. H. Fryd	4,857
Spencer, Santo and Co., Ltd. ...	4,750
Pudney and Son	4,728
Mason and Son	4,675
H. Potter and Son,* Chelmsford ...	4,647

*Recommended for acceptance.

(*Tenders continued on page viii.*)

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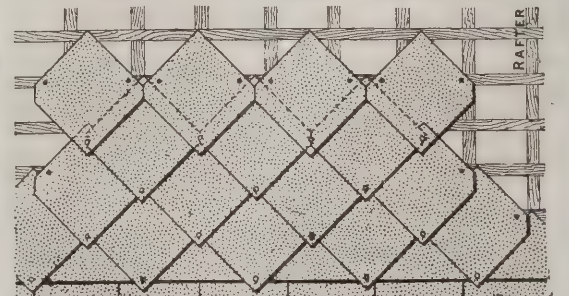

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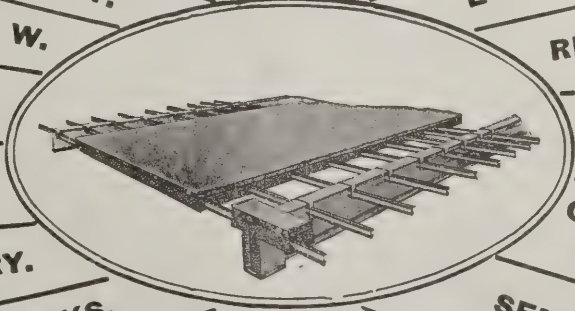

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(Tenders continued from page vi.)

Evesham, Worcs.—For the erection of a pair of semi-detached villas, on Greenhill, for Dudley M. Hole, Esq. Messrs. Dicks and Waldron, architects and surveyors, Evesham :—

G. Wells and Co., Worcester ...	£1,347
J. E. White, Evesham	1,325
M. Lissaman and Co., Mickleton...	1,319
Espley and Co., Ltd.,* Evesham ...	1,250

*Accepted.

Fosdyke (Lincs.).—For erection of new swing bridge across the river Welland at Fosdyke, for the Holland County Council :—

Sir William Arrol, Ltd., Bridgeton, Glasgow	£18,405	0	0
Horseley Co., Ltd., Tipton, Staffs.	18,049	0	0
A. Handyside and Co., Ltd.,* Derby	16,834	1	7
Head, Wrightson and Co., Ltd., Thornaby-on-Tees, Stockton	17,776	2	4

* Accepted.

Oswestry.—For the construction of open settling tanks, detritus tanks, storm water tanks, percolating filters, effluent outfall and other sewers, preparation of land, and other works in connection with the sewage disposal of the borough, for the Town Council. Mr. G. William Lacey, M.I.C.M.E., borough engineer and surveyor :—

O. Wright and Co., South Wigston, Leicester	£8,817	8	1
S. Hutton and Co., Northwich	8,420	0	0
H. A. Jones, Wrexham ...	6,800	0	0
G. P. Trentham, Handsworth...	6,781	13	11
R. Williams, Brymbo, Wrexham	6,780	10	0
Jowett Bros., Burscough, Lancashire	6,768	12	2
R. C. Brebner and Co., Edinburgh	6,317	6	1
L. Woodland, Birkenhead ...	6,185	14	4
A. J. Cottle, Sheffield	5,855	19	8
W. Underwood and Bro., Dukinfield	5,804	19	1
G. Bell and Sons, Ltd., Tottenham, London, N.	5,749	0	0
J. Taylor and Son, Basford, Stoke-on-Trent	5,679	11	0
W. Morley and Sons, Keighley	5,553	4	10
Johnson Bros., Hereford ...	5,529	0	0
A. Hill and Co., Kidderminster	5,447	12	0
W. Cunliffe and Sons, Corporation Street, Birmingham ...	£5,248	0	0
W. H. Thomas,* Oswestry ...	5,150	0	0

Borough Engineer's estimate, £5,637 18s. 1d.

*Accepted.

Ryde, I.W.—For the first part of the St. John's Parish Hall, Oakfield. Mr. George Broughton, architect, Ryde :—

T. and E. W. Jenkins, Newport	£697	10	0
J. Newnham, Ryde	674	10	0
A. P. Williams, Newport	670	0	0
J. Ball, Cowes	648	0	0
G. Gallienne, Ryde	605	0	0
F. H. Holland, Ryde	600	0	0
A. E. Hayden, Ryde	598	10	0
Wheeler Bros., Ryde	597	10	0
J. Wheeler and Sons,* Ryde ...	585	0	0
Adams and Mitchell, Haylands	547	18	0
J. Attrill, Sandown	516	12	0

*Accepted.

Southend-on-Sea.—For erecting new school, Bournemouth Park Road Council school, for the Education Committee. Mr. P. Brockbank, County Chambers, Weston Road, Southend-on-Sea, architect. Quantities by Mr. G. T. G. Wright, York Road :—

E. Leaney	£6,550	0	0
W. Houghton	6,389	0	0
W. J. Ballard and Co.	6,199	0	0
J. C. Flaxman	5,997	0	0
F. E. Woodhams	5,899	0	0
A. R. Whur	5,897	0	0
F. and E. Davy, Ltd.	5,877	0	0
E. and B. H. Davey	5,832	0	0
F. Davey	5,543	0	0
S. E. Moss and Co.	5,447	8	9
Brown Bros.	5,397	0	0
J. S. Hammond and Son ...	5,358	0	0
F. E. Whur	5,354	0	0
W. E. Davey	5,321	0	0
H. W. Grainger,* Southend-on-Sea	5,184	10	0

*Accepted.

Stevenage (Herts.).—For the construction of a brick and concrete covered service reservoir of 300,000 gallons capacity, and valve chambers, with inlet, outlet and washout pipes and valves, at the water works, near Stevenage, for the Stevenage Urban District District Council :—

T. J. Davies, Westminster. S.W.	£2,201	14	4
Wilkinson and Co., Finsbury Park, N.	2,159	0	0
Rowell and Sons, Chipping Norton, Oxon.	£2,081	8	6
F. G. Brummell, Willesden, N.W.	2,254	17	3
Edwards and Co., Strand, London, W.C.	2,298	5	3
L. Lown and Co., Holloway, N.	2,242	14	10
G. Bell and Sons, Ltd., Tottenham, N.	1,893	0	0
Ekins and Co., Ltd., Hertford	1,813	0	0
Shrouder and Matthews, Stevenage	2,062	0	0
Dean and Perkins, Uxbridge Road, Acton, W.	2,097	17	6
Wallace and Inns, Stevenage...	2,274	16	7
W. French, Hitchin	2,056	19	6
H. V. Smith and Co., Westminster, S.W.	2,303	4	1
R. C. Brebner and Co., Edinburgh	2,120	0	0
P. R. Paul, Waltham Abbey, Essex	2,097	0	0
W. J. Spratt, Stevenage ...	2,595	0	0
A. Jewell, Market Harborough	2,184	8	0
A. E. Farr, Frinton-on-Sea, Essex	1.860	0	0
J. Willmott and Sons,* Hitchin	1,830	0	0

*Accepted.

Wanstead.—For proposed receiving homes at Wanstead, for the West Ham Board of Guardians :—

Fitch and Cox, Enfield	£28,321
Harris and Wardrop, Limehouse ...	25,693
C. Wall, Ltd., Fenchurch Street...	24,959
Allen and Son, Ltd., Kilburn ...	24,934
Myall and Upson, Ilford	24,493
Webster and Son, Dulwich ...	24,321
A. N. Coles, Paddington	23,818
Pattinson and Sons, Westminster...	23,311
F. and G. Foster, Norwood ...	23,250
Kirk and Randall, Woolwich ...	23,224
B. E. Nightingale, Albert Embankment	23,075
Gathercole Bros., Norbury	23,000
W. J. Maddison, Canning Town ...	22,579
Brand, Pettit and Co., South Tottenham	22,400
F. and A. Willmott, Ilford	22,063
Spencer, Santo and Co., Kensington	21,998
F. and H. F. Higgs, Herne Hill	21,614
J. W. Jerram, East Ham	21,349
F. J. Coxhead, Leytonstone ...	21,115
A. E. Symes,* Stratford	20,919
H. J. Carter, Grays	20,646

Architect's estimate, £20,000.

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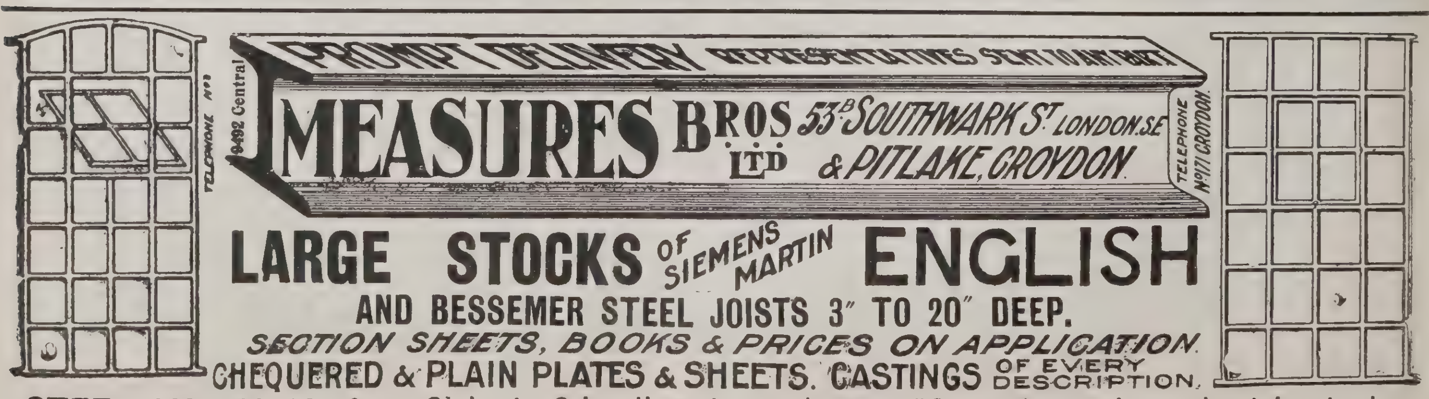
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September 22, 1909. Volume 30, No. 763.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

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The Abuse of Credit.

It appears from the official report of a meeting of the York Master Builders' Association, printed in another part of the present issue, that the subject of builders' locked-up capital has been taken into consideration by that body. It would not be surprising to find that this is the beginning of a general movement with the object of mitigating an evil that has been allowed to grow to proportions that without exaggeration may be called monstrous. In calling attention to the subject a fortnight ago, we cited the case of a large firm in the North that had sought relief in the bankruptcy court from the embarrassments arising from dilatoriness in settlement of accounts. Since then another case of colossal magnitude has been reported—that of a London firm of extensive practice and of high repute. In better times, with enterprise more active, and with money circulating more freely, both these firms would have remained silent as to the difficulties with which they have had to contend, and we should have lacked their dramatic demonstration of the extent of the evil. Not that the volume of bad and doubtful debts would have been much smaller; only that, in brisker times, the trader would have been less sensitive to its incidence. For prosperity, especially among the millowners, seems simply to increase the evil. We have lately seen, in the report of a meeting of millowners, some very strong remarks that, while they were addressed to very different interests from those we have in view, shed, nevertheless, a lurid light on the misfortunes of builders. The speaker, representing an organisation of millowners, complained of the recklessness with which, during bursts of activity in the textile industries, outside speculators formed companies that were not wanted, and built mills that were superfluous. Wild-cat schemes of this sort were, he declared, extremely common. The effects on the builder and contractor are only too obvious. The superfluous syndicate cannot pay its own way, and it may prevent the old-established owners from paying theirs. It may either prevent their legitimate extension of buildings, or, what is apparently even worse, may hamper their settlement of the builders' bill when they do extend. But millowners, superfluous or otherwise, are not the only and are perhaps, in the aggregate, not the chief offenders. The builders of churches, chapels, and schools could tell, if they would, some weird and almost incredible stories of the hope deferred (or the cheque delayed) which maketh the heart sick. Nor do municipal authorities (some of which are particularly keen on the "fair wages clause," without troubling themselves overmuch as to where the wages are to come from) invariably set a good example of prompt payment. They who, upon popular compulsion, are so solicitous on behalf of the welfare of labour, take away from it more than they give when by depriving building employers of interest on sunk capital they take away the means of treating labour more generously; and the same observation applies with added force to the professed preachers and teachers of charity, who may possibly be doing much spiritual good by running up buildings and running into everlasting debt with the long-suffering builder, but who at the same time are doing much material harm. Labour must not be sweated. Good; then why sweat the employer, who also is a labourer worthy of his hire? The disease seems to be chronic. Hard times having rendered it acute, now is the opportunity for devising and applying the remedy, and we trust that the Federation will not let the matter rest. The first step seems to us to be a vigorous attempt to create a healthy tone among builders themselves. This is only possible to organisation. Here is a direction in which united strength and wisdom may effect the reform of an intolerable abuse.

Gratification from Grimsby.

Grimsby Town Council is unique. It is pleased with the designs for its town hall. It is reasonable in its attitude towards architects. It is fairly generous in the matter of fees. But it is inflexible in the matter of forfeited deposits, although even in this matter it showed itself to be not entirely destitute of bowels of compassion. At a recent meeting of the Town Council, it was proposed to authorise the Borough Treasurer to pay the following fees in connection with the recent competition. First premium, £250; second premium, £150; third premium, £100; assessor's fee (one-fifth of one per cent. on the estimate of £26,000, and thirty guineas), £83 10s. As competitions go, this was not illiberal. The motion was not carried without amendment. It was decided to recommend the payment of the first and second premiums, but that the payment of the third and the assessor's fee should stand over until the question with regard to the cost of the scheme had been settled. The Borough Treasurer was authorised to return their deposits to the architects who had complied with the conditions; but with respect to those who had not, there was some difference of opinion. One architect who has become swiftly sensitive to the wave of prosperity that is shortly to overwhelm the profession, had sent a letter to the effect that, "owing to a sudden pressure of work, he found he was unable to complete the designs in time," and his deposit was returned; nine others, who, we devoutly trust, are labouring under the same happy hindrance, had not sent in any designs, and apparently were too busy to write a letter asking for their money back. Their deposits are to be retained. Perhaps, in the fortunate circumstances we hope that we are right in conjecturing, they can well afford to lose the money. Sir George Doughty did not wish to take advantage of the rigour of the rules. "Why," he asked, "should a Town Council want sixteen guineas from people of that kind [we freely forgive him this slighting expression, in consideration of his broad humanity], who for some reason or another had not sent in plans?" The Borough Surveyor having pointed out that the scheme sent to each competitor had probably cost seven or eight shillings, another councillor suggested the ingenious compromise of deducting the Council's expenses and returning the remainder. Yet another thought it would be better to share the forfeited deposits among the architects who had "sent in designs and not got a prize." This proposition was received with laughter, the mathematicians on the Council no doubt perceiving that the consolation prize would amount to about 5s. 6d. a head. The Mayor settled the matter by remarking that having made conditions it were best to stick to them, lest peradventure "they may come up against you in other matters." But, alas! it is not yet absolutely certain that the designs for which the

Council have expressed such unstinted admiration will be carried out; for it was suggested that the Council should "take a reasonable time before proceeding;" and, with the changes and chances of this naughty world, and the municipal elections due in November, there is no telling what may happen. But we do hope that Grimsby will get the beautiful town hall it desires and deserves.

The Last Straw for Brickmakers.

As to the Budget proposals we have been inundated with opinions for and against; but as they have dealt with matters that have been for the most part purely hypothetical, we have refrained from giving them prominence. Generally speaking, they are overcharged with political bias, and this is not a political organ. The opinions of builders as well as of other business men) as to the land clauses have been collected by a daily contemporary, and these show that while the majority of the builders who have responded are against the Budget proposals, there are many firms of standing who express themselves strongly in favour of the scheme. Neither side argues the point. Each side contents itself with saying, either that if these proposals are passed, building will be paralysed and unemployment will be worse than ever; or, on the other hand, that the Budget will place industry on a more equitable basis and inaugurate a new era of prosperity. This, in each case, is to indulge in the peradventures of prophecy. The fact that the Budget has been already the cause of deepened depression in the building trade is a serious thing in itself; but it proves nothing except that in this as in all such crises the capitalist is holding his hand until he can see which way the cat jumps, and refuses to operate until he can see more clearly either the best or the worst of it—which, it is pretty safe to say, will be neither so good nor so bad as the respective partisans so glibly and so confidently prognosticate. There is, however, one plain issue about which we feel it to be our bounden duty to speak out with no uncertain voice, and that is the remarkable proposal to tax brick earth as a mineral. There are those who, with a pedantic delight in splitting hairs, seek to cut the ground from Mr. Lloyd George's feet by proving that "the courts of law have never yet held clay to be a mineral." These disputants mean well; but we should be disposed to class them with those ingenious persons who, in a similar effort to beg the question, used to declare that tobacco was a food. To us who are more intimately concerned with the main and vital issue, it would not matter two straws if clay were twenty times a mineral. No matter if it were mineral, animal, or vegetable, or all three, or none of them, we are very certain that it never ought to be taxed. For years past, the brick and tile trades have had a bitter struggle for existence, and the imposition of the smallest tax on their raw material would probably involve most of the smaller yards in absolute ruin. But even supposing this calamity were averted, the tax must operate in restraint of trade. It would increase—inappreciably, we are told, but we take leave to doubt it—the cost of building and the influences in that direction are already sufficiently overwhelming. We feel sure, therefore, that builders will unanimously join us in wishing complete success to Mr. H. Greville Montgomery's able and strenuous opposition, in and out of Parliament, to what are cannot but regard as a singularly ill-timed and ill-advised attempt to put the last straw on the back of an over-burdened industry. The Chancellor and the Government probably realise the unpopularity of the tax. Their difficulty is no doubt of the *non possumus* order. Exemption in one case would raise a demand for concession in others; but we have yet to learn that compromise is a daring novelty in government; and this seems to be an instance in which it could be judiciously and defensibly exercised.

The Snare of Veneration.

We are all, no doubt, very much in sympathy with Goldsmith's Mr. Hardcastle, who loves everything that is old, and with Shakerly Marmion in "The Antiquary," who asks, "what find you better or more honourable than age? Take the pre-eminence of it in everything; in an old friend, in old wine, in an old pedigree." Yet the preference should not be absolutely preferential and exclusive. That is a fault that is as little to be admired as the opposite extreme of the craving for novelty; the one being perhaps a revulsion from the other. There are those who seem to hold that nothing new (especially in buildings) can be good; and this would almost seem to be the attitude of a writer in a church newspaper, who, in noting that Selby Abbey is to be re-opened after the restoration necessitated by the fire that occurred there three years ago, makes the following ingenuous remarks: "It is said that the Abbey has been restored to even more than its former beauty, and now stands as one of the classical architectural treasures of the country. We do not know exactly how a restoration can be better than the original work, but Mr. Oldrid Scott, son of the famous Sir Gilbert, who has been the architect, appears to have been very successful." Why this quibble? There is no real contradiction of terms. We might just as reasonably say that we do not know exactly how a Gothic building can be classical, but it would be a perversion of the author's meaning. Is the writer one of those archæological enthusiasts who would have the very blemishes of a building faithfully copied in the restoration? The mere question should resolve the writer's problem, by reminding him that "the letter killeth"; but to it we would add that, given a modern architect of the competency of Mr. Oldrid Scott, there are doubtless many details in which the old work could be undeniably improved. Surely, if knowledge and skill and refined perception are progressive, the modern architect must have an enormous advantage over his predecessors of centuries ago, in spite of the many countervailing influences; and therefore we are very ready to believe that Selby Abbey, as a matter of craftsmanship and pure æsthetics, is now not only a more durable but a more beautiful building than it was before the fire. That it must long lack the antique historical charm of the old building, and that it can never be regarded as a true creation of this or of any other age, is a different matter; and yet, in spite of prescriptive restrictions, it will bear, we suppose, a twentieth century touch that will render it for future generations an interesting though not a very characteristic relic of these our days.

The date of the third International Congress of School Hygiene has been postponed to August 2nd to 7th, 1910.

R.I.B.A. EXAMINATIONS AND RECENT MODIFICATIONS.—II.

(*Continued from page 129, No. 758.*)

In the first part of this article, published in the issue of this journal for August 18th, we made some general remarks on the modifications recently made in the R.I.B.A. examinations, and treated in detail the questions set in the historical papers of the Intermediate. We now propose to deal briefly with the "Science" subjects of this examination, and then to turn to the Final.

The last three papers of the Intermediate are not, in their relation to this article, so important as the first four, in that they have not been altered or modified in any way; but a few points of interest to the student preparing for the examination may be usefully indicated in discussing the questions set. As before, we refer to the questions by number only (a complete copy of them can be obtained from the secretary, No. 9, Conduit Street, W., for 1s.)

Subject V.—Theoretical Construction: Stresses, etc.

Question 1.—This question is worth notice as emphasising a change which has for some time been taking place—the use of "rational" rather than the "empirical" formulæ which two or three years ago were the only ones required. This method of calculation requires a little more insight into first principles, and the importance given to it is undoubtedly an improvement.

Question 2.—This question can be worked either by the same method as required in question 1, or by the common formula, but it is well to notice that there is evidence of a growing necessity for refinement in calculation in order to satisfy the examiners; candidates should beware of getting into the habit of using stereotyped approximations in the dimensions of their steel work, otherwise the exact fractional dimensions here set might lead to difficulties.

Question 3.—Here again we find that it is no longer sufficient, as it was for many years, to learn by "parrot" methods the outlines of the reciprocal diagrams to a few well-known roof-trusses; one is liable to be asked to calculate the stresses in any simple triangulated structure by this graphic method, and to explain clearly the method employed.

Question 4.—This is an old question in a new form. Reference has frequently in the past been made to the reasons for the squaring of "d" in the ordinary empirical formula for beams of rectangular section—a knowledge of principles as well as of facts must always be regarded as essential.

Question 5.—This is, perhaps, a question involving knowledge of a more advanced character than is usual. One must be able to see how the position of a load may modify the stresses in a column so that part of it, like a loaded beam, may be in tension, while the other part is in compression. There is also another difficulty, viz., practical considerations suggest cast metal for the "column" form, but the stresses involved seem rather to call for wrought steel; much would depend on the size of the structure. In the answer the case for both materials should be argued, showing one's knowledge of their characteristics, as no mere statement of one's choice would satisfy the examiner.

Question 6.—Needs little comment: it is a straightforward question of practical calculation. It involves the inevitable sketch—practical drawing of steel work is one of the essentials for success in both examinations.

Question 7.—This also is a question of simple calculation, involving a knowledge of strength of materials in common use.

Questions 8 and 9.—These are both calculated to show the power of observation and reasoning possessed by the candidate—they are not questions which can be readily learnt from a text-book.

Questions 10 and 11 will present no difficulties to the student who has been conscientiously through his text-books. They differ materially from the last two in this respect, and show the necessity for a wider scope of knowledge than has been required hitherto, and something more than is obtainable in the smaller text-books.

Question 12 needs no comment.

Question 13 is easy for one who understands how the ordinary formula for rectangular beams is built up, and the real meaning of a "constant."

Questions 14 and 15 are both questions of quite the ordinary type—both are easily obtained from any text-book on the subject.

On the whole the paper is not more difficult, perhaps, than usual, if one takes into consideration the unusual choice of questions allowed. The first three were compulsory, of the remaining twelve only four were to be attempted: presumably, as there is no indication of the number of marks allotted for each, they must each carry the same number of marks, though it is difficult to see how this can be so. It seems best to advise prospective candidates only to choose the very simple questions where they are unable to attempt those of a more ambitious nature.

Subject VI.—Descriptive Geometry.

It is difficult to know what advice to give to candidates preparing in this subject. As a general rule the same questions, with very slight modification, appear time after time. An analysis of past papers shows that a knowledge of about ten types of questions is sufficient to ensure success. Text-book geometry is not encouraged, but rather the practical geometry involved in the usual office drawings of roofs and such-like isometrical sketches of details constructive and otherwise, and simple mensuration. The present paper is no exception.

Subject VII.—Elementary Applied Construction: the Nature and Use of Ordinary Building Materials.

Generally, it may be said that the latter part of the subject receives as a rule but scant attention—in this paper the "nature" of building materials is not touched upon in any question, but none the less is would never be safe for a candidate to fail to study this branch of the subject in all usual building materials—but such study should be largely a practical study—the more scientific knowledge is required only of the final candidates. All the questions may be said, in a sense, to involve a knowledge of the use of materials, and most of the common building trades are represented.

Question I. covers a great deal of ground, and principally needs quick freehand sketches—descriptive matter should be very concise.

Questions 2 and 3 are both working detail drawings, and such as any assistant might be required to make in the course of the day's work. Both involve some knowledge of bylaws or Building Act.

Question 4 is of usual type, easily answered from a text-book on elementary construction.

Questions 5 and 6 are of more advanced type, and need some individual thought and treatment. It would be difficult to find an answer in any text-book, but they should present no difficulties to an intelligent student with some power and opportunities of observation.

There was here no choice of questions; every candidate was expected to answer all of them.

FINAL AND SPECIAL EXAMINATION.

We now come to the questions set in the Final examination, and in this case the modification was confined entirely to subject II., the historical papers. The actual comparison of the paper set this year with those of recent years will be dealt with in the order of the subjects.

Subject I.—Design.

The Design subject this year was a very interesting one and gave a good deal of scope to those whose experience was chiefly derived from country domestic work. The tendency was to elaborate the plan into an institution rather than a block of homes, worked upon village lines, as far as possible, which was probably the examiner's intention. This inference is drawn from the fact that a block plan was asked for, probably to indicate the relation of one such house with the others of a group, although for such a purpose the scale asked for was inconveniently large. The dormitories (for about 10 children each, allowing about 40ft. super. for each child), with the necessary offices, were the settling factors of the plan, and the aspect of the principal rooms should have been carefully considered and indicated; the details should have been simple. The chief complaint in the design subject is always want of time, but this should not be felt so acutely if those sitting would practise designing small subjects beforehand, ponder carefully the problem when it is announced some days before the examination, getting up any technicalities that the particular problem may contain, and also suitable detail for the style they mean to adopt, which can in almost all cases be settled beforehand, and which is not likely to be overridden by the conditions. On the other hand, it is almost as great a mistake to have a stereotyped plan in one's mind before the examination, as such a plan is more than likely to be rendered entirely useless by the further particulars given in the examination room, and often becomes more a hindrance than otherwise. It cannot be too often impressed upon those taking the examination that this is the most vital subject of all, and that success is hardly possible without a good deal of experience in planning; the same remark applies to the sketch perspective required. Although only a sketch, it should indicate a familiarity with the science of perspective, and this cannot be attained by merely setting up one or two perspectives previous to taking the examination. A certain proportion of candidates seem inclined to omit it altogether, but this is a mistake, as no opportunity of making marks should be lost.

Subject II.—The Principles of Architecture: their Theory and Application.

The nature of the first part of the subject came as rather a surprise probably to the majority, as it contained no question of a definitely historical nature, although all the questions involved a knowledge of principles that must of course be based upon precedent, and which must thus involve a sound general knowledge of the architectural styles as exemplified in the more important buildings in those styles. As in the Intermediate, so in the Final, the examiners are endeavouring to encourage the critical faculty, to emphasise the fact to which Mr. Blomfield calls attention in his new book, "The Mistress Art," viz., that "It is more profitable, even if much more difficult, to search out the message that each generation has to offer in its turn, even though the language is strange and its accent seems unmusical," or again, "study, with a mind alert for all suggestions that may bear on modern practice, and with a keen sense for those underlying strains of thought and feeling by which they attach themselves to the art that went before and to that which followed." Indeed, this book should be read by all intending candidates, as well as Mr. Belcher's "Essentials in Architecture."

Dealing with the paper question by question, we find that the candidates were required to answer only three out of the five questions, a very fair and, as we venture to think, wise precedent. The first question as to the architectural reason for the flêche as at Amiens, was probably the one that appealed most to the men whose studies had been mostly confined to Gothic work. The value of the feature was constructionally to avoid the awkward junction of the nave and transept roofs and aesthetically to give "unity" to the whole composition by a central verti-

CHARLTON ABBOTS.
Aug 1909.

FROM A SKETCH BY C. WONTNER SMITH, A.R.I.B.A.

Charlton Abbots Manor House is a stone building of typical Gloucestershire design of the seventeenth century, built on the side of a steep hill out of which it seems to grow. The sketch was taken during the recent excursion of the Architectural Association to Cheltenham and district, and is reproduced by permission from the "Architectural Association Journal."

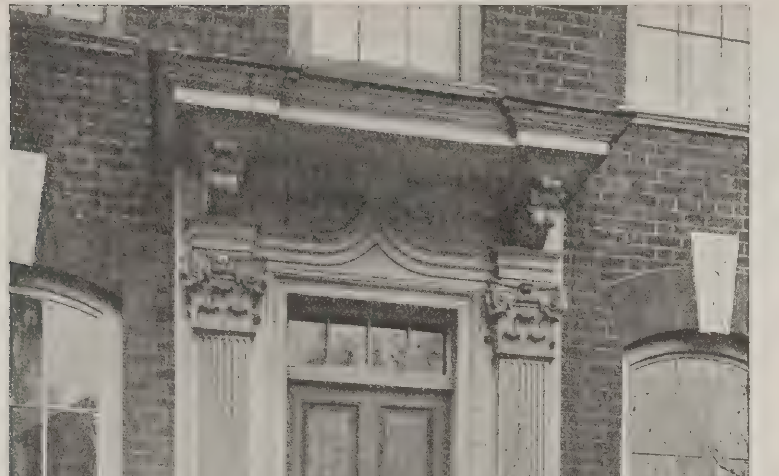


Photo · *F. R. Taylor.*

FRONT DOORWAY, NO. 4, CHEYNE WALK, CHELSEA

No. 4 possesses the most beautiful of all the doorways in Cheyne Walk. It consists of an elaborate hood with carved brackets which overshadow two fine Corinthian pilasters with boldly traced foliage.

(*Reproduced, by permission, from* " *The Survey of London—Chelsea.*")

cal "rallying" point, just as was so often done in England by the central tower as at Chichester, Worcester, Gloucester, and many other cathedral churches. Such a feature is practically necessitated on a cruciform plan, and the need is supplied by the domes of such buildings as the Pantheon, Paris, and St. Paul's, London. It must, however, only be used where the "motif" is unity or verticality, rather than continuity or horizontality; for instance, one can imagine a flêche upon such a building as the Banquetting Hall, Whitehall, or, more unholy thought still, upon the Parthenon, as striking an utterly false note and throwing the whole design out of harmony, and destroying the repose of these buildings.

Mr. Belcher, in his book already mentioned, cites the Temple of Neptune at Paestum, the Gran' Guardia Vecchia at Verona, and the interior of the Accademia delle Bell' Arti, Florence, as being examples of the quality of Repose in Buildings, and perhaps the river front of our own Somerset House might well be given. It will be seen by these examples that the quality is obtained by strong horizontal lines, especially as regards skyline, and a continuity gained by the repetition of any vertical features, and internally by broad simple treatments with an entire absence of "fussy," "busy" detail.

Dealing with the third question one might say that the quality of strength is generally expressed architecturally by general pyramidal form, by battering of the lower storey or abutments, by massing of supports, especially in the lower portions of the design, by largeness and heaviness of material emphasised by rustication, channelling, heavy keystones, etc. Old Newgate and the Riccardi Palace are those most often cited; the west front of St. Mary Woolnoth also expresses a good deal of strength.

The fourth question is a somewhat strange one; we have been unable to find any "well-known" example of a stone ashlar faced building with brick dressings. Certainly such a use of materials would be indefensible under ordinary circumstances, since it would be the binding in of the stronger and larger by the weaker and smaller materials. If the term ashlar-faced had not been used, the brick-quoined flint-built buildings of East Anglia might have been given, but in these the use is justified by the absence of the objection just quoted.

In the last question we should say that scale is given by ashlar as compared with thin coursed rubble. Ashlar work also gives a lighter tone to building, and, generally speaking, a broader, more restful, and more dignified expression. Ashlar would therefore be used where these qualities were desirable. Where the scale of the building is small, as in most Gothic work, the smaller material would be more suitable, but it depends very much upon the feeling of the design, and should have been illustrated by a sketch, showing at a glance the character of the design suggested for the use of each material.

The subject of the afternoon's essay, viz., "A brief historical and descriptive thesis of the constructive and decorative principles governing the orders as used in the great Classic and Renaissance buildings," was a very fair one; every candidate should have made a good show. The tendency was to describe the individual building rather than the principles illustrated thereby. The orderly manipulation of the various divisions of the subject would be sure to gain many marks, and should be carefully guarded by the preparation of an outline before starting to write the thesis proper. For instance, the subject would naturally divide itself into the Greek, Roman, Early (or constructional) and Late (or pedantic) use of the Orders, and each sub-division would then be treated from the constructional first, and then from the decorative point of view.

It will be seen from the above notes that the need for historical knowledge is by no means reduced by the modifications. In answering the above papers many sketches of and reference to historical buildings were necessary, but they are to be studied as a whole, and the course of development and its causes must be studied in a far broader way than can be done from the, until recently, accepted text-books, or than was necessary when disjointed details were asked from certain well-defined buildings of a particular style. It only emphasises the need either for attending the recognised schools, which are all now in touch with this more hopeful training of the architects of the future, or of at least following the reports of lectures and papers given thereat, and of being generally familiar with the most modern thoughts upon the subject.

We have thought it advisable to dwell somewhat fully on the "Art" side of the Final, as it is in this part only that the modification has been made. Upon the remaining subjects we propose only to give a few notes of advice as to the best methods of preparation.

For Subject III.—the Nature and Properties of Building Materials—we should say that a careful study and analysis of the usual text-books, coupled with the ever-important observation of practical work, could hardly fail to ensure success. Failure is principally due to the lack of knowledge how to read for an examination. The purpose of such reading must always be kept in view, and annotation is the keynote of success. In a secondary sense it is important to keep an eye on modern inventions and improvements, and not to despise "catalogues." Natural materials can generally be studied in the larger towns at geological museums; and it is well worth while to spend a few hours in this way.

Subject IV.—The Arrangement and Construction of Buildings in Relation to Health.

In this subject, as is usually the case, the chief question was a system of drainage in plan and detail. This would present no difficulties to the majority, but it nevertheless offers opportunities of economy in design and for the display of a knowledge of modern appliances.

The two compulsory questions dealt with this subject, and of the remaining eight only three were to be attempted, and it is therefore hard to see how any candidates who had prepared for the examination could fail, but the fact is generally fairly clear that failure is often due, not to the lack of knowledge, but to lack of practice in putting it on paper in a manner satisfactory to an examiner.

All the remaining questions were fairly calculated to bring out a knowledge which should be regarded as essential to any architect, and, as is usually the case in this subject, they mostly deal with practical requirements rather than with principles.

(*To be continued.*)

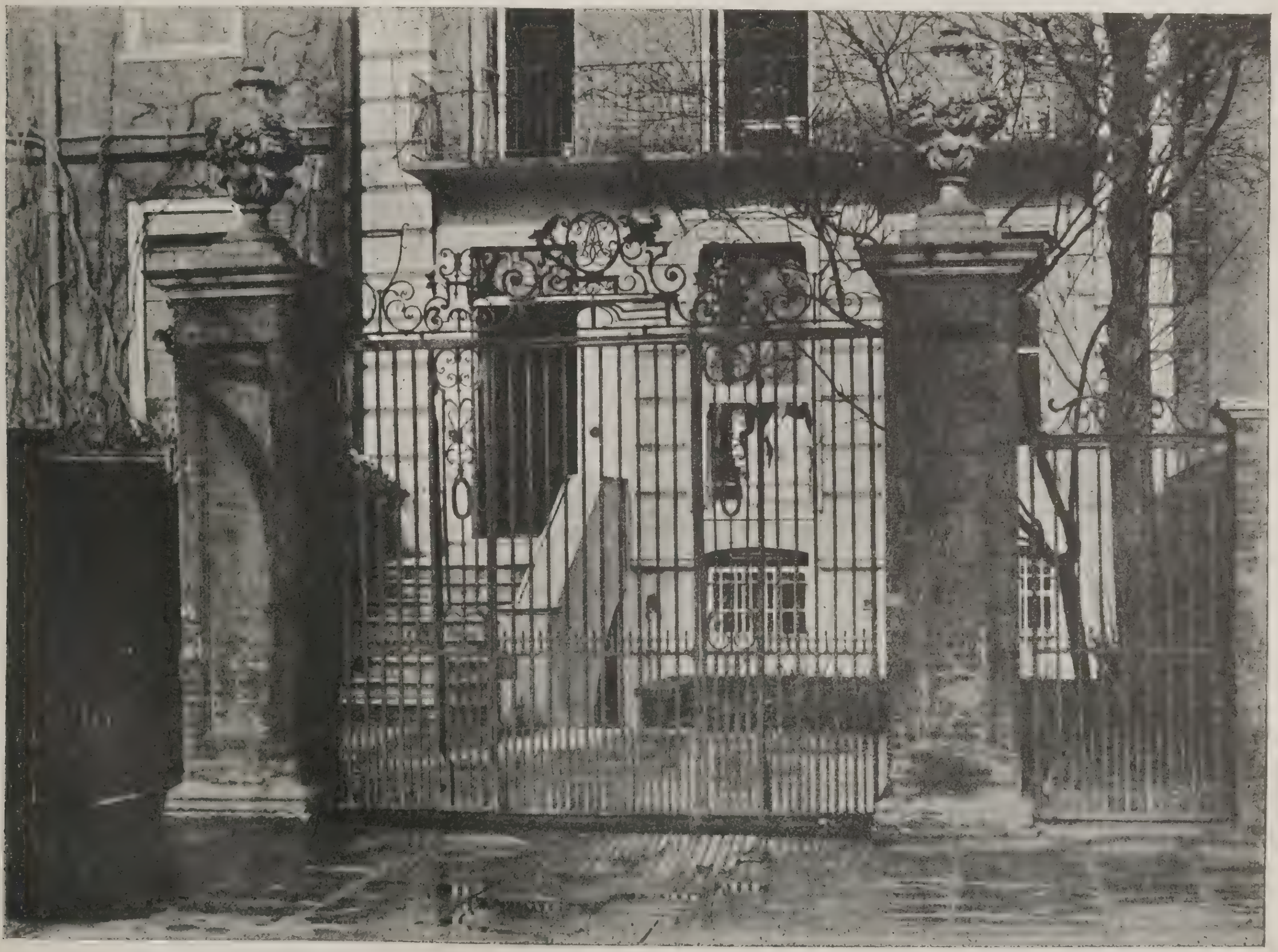
CHARMING CHELSEA.[*]

In spite of its glooms and grime, and of its many mean streets and sordid suggestions, Chelsea, on the whole, is a charming place. Its baser elements serve but as a foil to the quaintness and the beauty that have survived the many vicissitudes to which in latter days the parish has been subjected. It is not for nothing that Chelsea has been and still is a chosen abode of authors, artists, and other persons of refined taste. "To live here, as the writer has done, not far from the Old Church and the river, is to understand how strong its hold can still be upon the affections—it is borne in upon one, intimately and irresistibly. The story of its illustrious men and women may kindle the imagination, but it is its atmosphere—the subtle effect of its history—that will be felt most. Chelsea is responsive to one's moods; it is a place where one cannot remain long a stranger, for it takes one into its confidence, as do all places which have been the scene of centuries of human effort, tempered by just such a quiet unchanging influence as that of the broad river which flows still, as it used to flow, by the time-worn village street. It is this atmosphere that makes Chelsea what it is, in spite of the loss of its ancient palaces, its low river-wall, its river stairs, boats, and summer-houses, and many of its most beautiful rows of humbler homes."

It is in this sympathetic spirit that Mr. Walter H. Godfrey has approached his onerous but enviable task of making the survey of Chelsea, and, with the help of active members of the Committee of the Memorials of Greater London, of which he is so distinguished a member, he has produced a really fascinating book, which, as a record that must necessarily endure long after the objects it describes have ceased to exist, will be of immense service to many a future historian. That Mr. Godfrey should have described and appreciated with the acumen of a trained architect the external and internal features of notable buildings and their adjuncts is only what would have been expected; but that he should have searched the archives with the perseverance and erudition of a seasoned antiquarian would be little short of astonishing if one were not aware that the combination of these qualifications is, after all, happily not rare, although it is but seldom found of such intensity in both kinds.

The book contains eighty-seven pages of the crude spirit of history, in which the essential data are massed together without the addition of an unessential phrase, and yet have been somehow rendered quite readable. There are ninety-four plates, mostly from photographs of varying degrees of merit, but including a few measured drawings that are without exception excellent; and there are, besides, eleven illustrations in the text, and twenty-one heraldic engravings. Mr. Godfrey has himself contributed several of the drawings, as well as the folding map that forms the preface. The pictures are of almost exclusively architectural interest, not excepting the several interesting specimens of old lead work, and the handsome ironwork gates and grilles. As Mr. Godfrey states in his preface, the buildings are in the main of eighteenth century date, or a few years older, and they owe their existence chiefly to two events in Chelsea history: the one, the completion of the Royal Hospital in 1691, whence sprang Paradise Row; and the other, the purchase of the Manor by Sir Hans Sloane, which gave us the charming houses in Cheyne Walk.

Of the three illustrations which we are permitted to reproduce, that showing the gates at No. 5, Cheyne Walk, is associated with some rather curious speculations as to the origin of the gates. "These gates," says Mr. Godfrey, "are somewhat of a puzzle, for at first sight their size and importance seem incongruous when compared with the modest dimensions of the building. The three gates occupy the full length of the frontage, that in the centre being divided from the two smaller ones by fine brick piers surmounted by a good stone cornice and vases of quite exceptional excellence. The piers seem to have been designed for large double gates; they are 11ft. apart, and would take two gates each 4ft. wide, as well as the wrought-iron panels or pilasters. The pilasters are here placed on each side of the single gate, and the rest of the space is made out with plain railings. The wrought-iron scroll-work which crowns the gate and railings includes two charming lamp-stands and a monogram of interlacing initials. The two smaller gates have each some simple scroll-work upon the bar under which they open. The first doubt that naturally arises in the mind—as to the reason for a large centre gate and two small ones in front of so confined a forecourt which gives access to a house whose entrance door is not central but placed at the extreme left—is partly dispelled by Mr. William Ascroft, who has made the following note: 'The doors were originally in the centre, opening into a large hall, now the dining-room. The approach was by a wide flight of steps with



GATES, NO. 5, CHEYNE WALK, CHELSEA. *Photo: A. H. Blake.*

These gates have an interesting history. They were obviously not made for the position which they now occupy; and they seem to correspond with designs, found in the archives of the Moravians at Herrnhutt, of gates at Lindsey House, as renovated by Count Zinzendorf in 1750.

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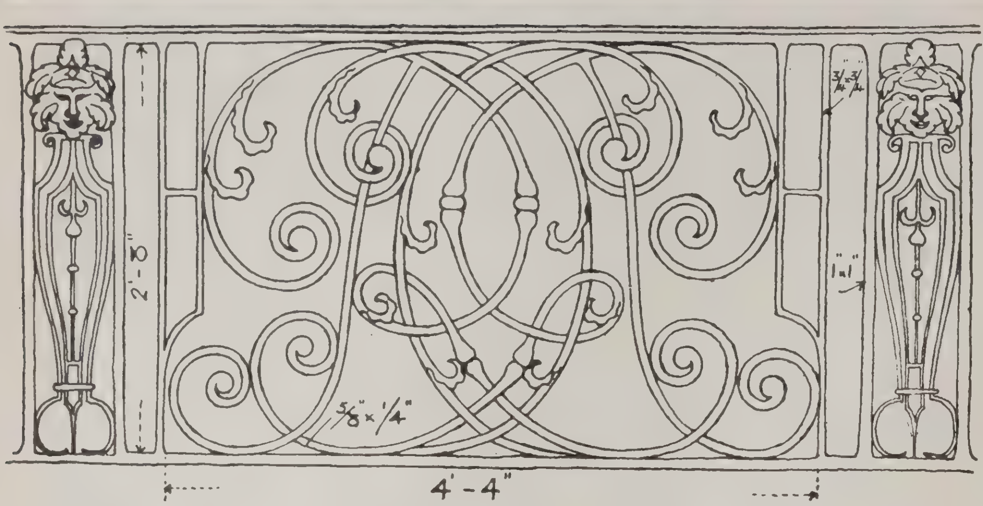
[*] The Parish of Chelsea (Part I). By Walter H. Godfrey, Architect, being the Second Volume of the Survey of London, and the Eleventh Publication, of the Committee for the Survey of the Memorials of Greater London. Published by the Committee, 23, Old Queen Street, Westminster, and to be obtained from B. T. Batsford, 94, High Holborn, W.C.



MONOGRAM RAILING AT QUEEN'S HOUSE, CHELSEA. DRAWN BY EDMUND L. WRATTEN.
The centre part of this railing is entirely composed of the letters RC, written backwards and forwards. The masks are finely cast.

stone balusters and low wall. The pavement was of tesselated marble, the larger squares white, the smaller black, some pieces of which may still be seen at the gate.' The central door," Mr. Godfrey comments, "would certainly make the gates seem less meaningless, but the latter would even then be quite inappropriate to the size of the house. It seems probable, too, that the former position of the door in the centre was in itself an innovation, since there is no reason to suppose that the plan of No. 5 was an exception among its fellows in the Walk." Mr. Godfrey therefore suggests that "the same occupant of the house, whose ambition required a central doorway and a large hall, effected the transfer of these three gates and piers from some larger mansion to give greater distinction to his home." Whence the gates came nothing is certainly known, but Mr. E. L. Meinertzhagen has put forward an exceedingly interesting suggestion. In the Moravian archives at Herrnhutt in Saxony are preserved certain drawings of Lindsey House, Chelsea, as renovated by Count Zinzendorf in 1750. In Mr. J. J. England's careful drawings from the originals, published in his account of the Moravian Settlements, some fine iron gates are shown on the river front, which bear a striking general resemblance to those at present before No. 5. These gates are no longer at Lindsey House, and M. Meinertzhagen supposes that they may have been bought by a resident of Chelsea who lived so near, at the time of the relinquishment of the property by the Moravians—about 1750.

The monogram railing here shown, as drawn by Mr. Edmund L. Wratten, is from Queen's House, No. 16, Cheyne Walk, formerly known as Tudor House, where it occupies the position of the plain rail over the large centre window. The interlacing initials RC are very ingeniously adapted to the space by writing them both backwards and forwards. The finely cast masks are noteworthy. Queen's House is rich in ironwork, and has some beautiful little iron balconies; but the monogram railing, although apparently of the same period as the house, which was built in 1717, was the fortunate "find" of a recent tenant.

The doorway of No. 4, Cheyne Walk, here shown, Mr. Godfrey esteems as the most beautiful of all in that row. "It consists of an elaborate hood, with carved brackets that overshadow two fine Corinthian pilasters with boldly traced foliage." Its date is probably 1718. Through this doorway "George Eliot" entered as tenant on December 3rd, 1880; and through it her body was borne to the grave ere the close of the selfsame month.

The author and his helpers are to be sincerely congratulated on a very estimable and substantial addition to the literature of topography. The society that can produce such books needs no further *apologia*. It has fully justified its existence.

THE WIDENING OF BLACKFRIARS BRIDGE.

The widened Blackfriars Bridge over the Thames was formally taken over from the contractors by the Corporation of London on August 31st, and was formally opened on September 14th. The work of widening the bridge has been in progress since February, 1907, and has proceeded uninterruptedly since that date. The contract for the whole of the work was placed with Sir William Arrol and Co., Ltd., of Glasgow, and the bridge was to be completely finished ready for traffic by February, 1910. So expeditiously has the work been carried out, that it has been finished about six months ahead of time, and within the estimated cost; and this excellent record has been made notwithstanding that the additional work for the tramways was undertaken by the firm on the understanding that it would not interfere with the completion of the main contract. It was the original intention of the Corporation to lay the tramway tracks after the main contract was completed. This is a record in bridge-building, and the creditable performance is due to the excellent arrangements and foresight displayed by Sir William Arrol and Co., Ltd.

The First Bridge.

A bridge over the Thames has existed on this site for 140 years. The first bridge was an elegant stone structure of nine arches, from designs by Mr. Robert Mylne. The foundation stone was laid on October 31st, 1760, and the bridge was completed in 1769. The completed bridge cost £166,217, of which £13,377 was for the approaches and arching over the Fleet Ditch. The increased flow of the river, consequent on the removal of old London Bridge, caused increased scour in the vicinity of old Blackfriars Bridge, and undermined the foundations.

The Present Bridge,

as it existed until the spring of 1907, was designed by Mr. Joseph Cubitt, and was the selected design in an open competition. The work was begun in June, 1864, and the bridge was opened on November 6th, 1869. The total cost was £269,000.

The bridge has a total length between abutments of 922ft., and is divided into five spans, the two abutment spans being 155ft., the two intermediate spans 174ft. 5ins., and the centre span 186ft. 5ins. The two centre piers are 18ft. 2ins. wide at the springing, and the intermediate piers are 20ft. 6ins. wide. The clear width between parapets was 75ft.

Particulars of the Widening.

Each of the piers is founded upon six independent wrought-iron caissons, four of which are rectangular in shape, and the two outer ones are curved to a radius to approximate the form of the cutwater. The caissons were sunk into the clay, with spaces of 3ft. between them, which were afterwards cleaned out and filled with concrete. The piers are built of granite ashlar with brickwork hearting, and have cutwaters ornamented with polished red granite columns having Portland stone pediments and capitals. The abutments, which have a total thickness of about 40ft., were built within coffer dams upon concrete foundations. They are formed of concrete and brickwork, and faced with granite ashlar.

Each span consisted of nine wrought-iron arched ribs spaced about 9ft. apart, with suitable cross bracing between them. The ribs supported floor girders upon braced spandrils. The granite setts of the roadway and paving of the footways are supported upon concrete resting upon buckled plates. The ornamental spandrils of the outer ribs are of cast-iron, to which an ornate fascia is bolted at the footway level. The parapet is of ornamental cast-iron.

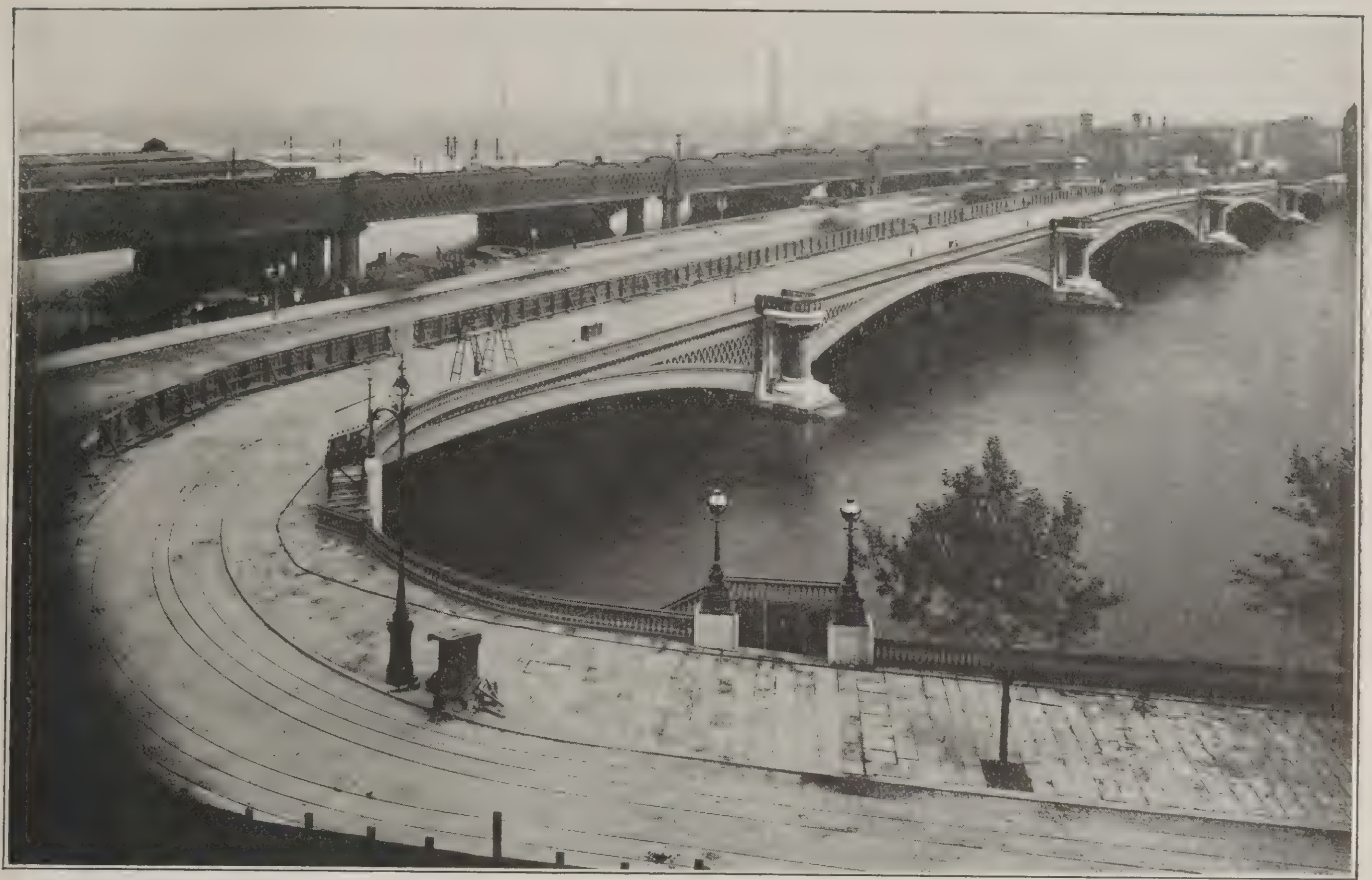
The desire of the London County Council to run their southern electric trams over the river to relieve the congestion at their termini at the bridges led the Corporation of the City of London, under whose jurisdiction the bridge is, to apply to Parliament for permission to widen the bridge to link up the trams on the Embankment with those on the south side of the river. The engineers for this work were the late Sir Benjamin Baker, K.C.B., K.C.M.G., and Mr. Basil Mott, M.Inst.C.E.

The work involved increasing the width of the roadway of the bridge from 43ft. to 73ft., providing a large curved approach from the Embankment to the north span, and laying a double line of electric tramway on the new portion of the road.

How the Work was Done.

The existing abutments and piers had to be extended 30ft. westwards. The extended piers were founded upon heart-shaped caissons, which fitted the existing cutwater caissons. These caissons were built over their final position, and lowered to the bed of the river. They were sunk under air-pressure into the clay and were filled with concrete during the process. A space of 12ins. left between the old and new caissons was cleaned out and filled with concrete. The masonry of the pier was then built up inside temporary caissons which were bolted to the permanent caissons. The cutwaters and ornamental masonry were removed from the old piers and re-erected on the extended piers. Special care had to be taken with the north abutment, on account of the proximity of the Metropolitan Railway tunnels. The new foundations were sunk lower than the old foundations of the adjacent works. The original intention was to sink one large caisson, but before beginning the work it was decided to divide the caisson into three parts to reduce the risk, and to drive a line of cast-iron sheet piling close to the underground railway to a depth beyond the level of the new foundations. After the caissons were sunk and filled with concrete, they were loaded with rails to produce a greater compression on the soil than was possible from the permanent load. The operations were successfully carried out without any disturbance to the existing works. The curve on the underground railway caused the extended abutment to be reduced in width, and the stability was maintained by building cast-iron blocks instead of brickwork into the abutment. A steel skewback girder to distribute the thrust of the arched ribs was provided at the springing level, and was securely bolted to the abutment foundations.

The south abutment was built within a coffer dam. No staging was permitted in the river except round the piers and at the north span. The steelwork of the north span was built upon centering supported upon this staging. It was a condition of the contract that the existing face ribs, with their cast iron spandrils and parapets, should be removed and re-erected as the



THE WIDENING OF BLACKFRIARS BRIDGE. THE LATE SIR BENJAMIN BAKER, AND BASIL MOTT, M.INST.C E., ENGINEERS.

The work involved increasing the width of the roadway of the bridge from 42ft. to 73ft., providing a large curved approach from the Embankment to the north span, and laying a double line of electric tramway on the new portion of the road. Sir William Arrol and Co., are the contractors.

face ribs of the widened bridge. This was done by means of an overhead traveller, which was built over each face rib after the piers had been extended. By means of suspenders from the traveller passing under the rib, the complete rib with the cast-iron spandrils and parapets was lifted from its bearings and traversed 30ft. westwards and lowered into its final position. The rib was steadied by transverse girders, which were secured to the face rib at one end and passed through suitable slippers on the last remaining rib of the old bridge. After the face rib was in position, these cross girders were secured to the ribs on each side of the 30ft. gap, and served as staging upon which to erect the three new steel ribs of the widened bridge.

In moving the face ribs to their new position, care was taken to transfer them in the order which would produce the least unbalanced thrusts upon the new piers.

The successful completion of this work so much within the contract time is a matter of congratulation to the Corporation of the City of London, the engineers, and Sir William Arrol and Co., Limited.

The Bridge Reopened.

The bridge was thrown open for traffic on Tuesday, September 14th. The occasion was rendered more important by the opening at the same time of the London County Council's tramway service across the bridge, which is now the widest bridge in London, having a width of 105ft. between the parapets, instead of 75ft. as formerly. The work of partial reconstruction has been carried out at a cost of £203,000.

The ceremony aroused much popular interest, and great crowds assembled, both at the north and the south approaches, to see the passage of the first tramcars across the bridge. Among those present were Mr. John Burns, M.P., Dr. Macnamara, M.P., Mr. T. McKinnon Wood, M.P., Lord Michelham, Sir William Arrol, Mr. Basil Mott (the engineer under whose directions the bridge has been widened), Mr. A. C. Morton, M.P., and Lieutenant-Colonel Probyn.

The Lord Mayor said that when this bridge and the other bridges over the Thames were first erected, the traffic problems of the metropolis were either nonexistent or were far different from what they are to-day. The tramway system had not come into operation, the Thames Embankment had not been completed, and motor traction was unknown. Consequently the bridges of London had gradually become hopelessly inadequate for the altered methods of locomotion. In these circumstances, the Corporation, acting through their Bridge House Estates Committee, assented to the request of the London County Council to widen this bridge to admit of the passage of their tramways over it, and the Corporation and the Council were there in happy unison to celebrate the completion of a work so beneficial to the metropolis. By the efficiency of the engineers and contractors, the undertaking had been completed some months in advance of the contract time. No delay in reopening the bridge had arisen, for the work was only absolutely finished the night before.

The Lord Mayor then walked into the roadway and removed a crimson cord which had been stretched across the new portion of the bridge.

Afterwards Mr. Deputy Algar, on behalf of the committee, presented to the Lord Mayor a silver rose-water dish, upon the surface of which was engraved a representation of the widened bridge, together with an inscription.

A few moments later a gaily-decorated tramcar, driven by Mr. A. L. C. Fell, the chief officer of the London County Council tramways, approached from the terminus at John Carpenter Street. Within it were Sir Melvill Beachcroft (Chairman of the Council), and the following members:—Sir John McDougall, Mr. Evan Spicer, Mr. W. R. W. Peel, M.P., Mr. A. Shirley Benn (Chairman of the Highways Committee), Captain Hemphill, Mr. H. J. Glanville, and Mr. J. Lort-Williams, with Mr. G. L. Gomme (Clerk of the Council). The car came to a standstill in front of the Lord Mayor, and the passengers alighted.

Sir Melvill Beachcroft, addressing the Lord Mayor, said that at the instance of the London County Council and its Highways Committee, as representing the Tramways Authority for London, he was deputed to ask permission for the cars to pass over the newly widened Blackfriars Bridge. In making this request he desired to say how sensible the County Council was of the great assistance which the Corporation of London had afforded the inhabitants of London by rendering possible the passage of tramcars by means of the widened bridge. The opening of the bridge for the tramway would relieve the congestion of traffic in Blackfriars Road, which had long been a source of danger and discomfort to travellers. and would add another invaluable link between the Council northern and southern tramways—a work the importance of which in its relation to the problem of London traffic could not be over-estimated.

The Lord Mayor said that this was one of those requests which were granted as soon as asked, and he had great pleasure in giving the desired assent.

Sir Melvill Beachcroft thanked the Lord Mayor, and invited him, together with the Sheriffs and other members of the party, to enter the car and travel across the bridge in it.

The Lord Mayor accepted the invitation, and himself drove the car across the bridge and back again to the pavilion. Four other cars, filled, like the first, with the guests of the Council, also made the journey, amid the cheers of the people.

In the course of the afternoon through services of cars along the Embankment and across Blackfriars and Westminster bridges were begun.

NOTES ON PAINTING AND DECORATION.

By Arthur Seymour Jennings.

Purity of Pigments.

In discussing the question of the purity of colours, one is apt to get into difficulties unless great care is exercised, because, as a matter of fact, in the case of many colours, no standard of purity really exists. Take Brunswick green for example. Here we have a colour which is made up of a mixture of chrome yellow and Prussian blue, both being precipitated together on a suitable base, which is usually either gypsum or barytes. The percentage of actual colouring matter varies largely in different makes, and an average sample of good Brunswick green should contain at least 25 per cent. "But why," one might ask, "is so large a proportion of white base allowed in the case of this green, when it is looked upon as being so objectionable in other colours?" The answer is simple. These greens are very rarely used for tinting (i.e., mixed with white), but are employed as "body colours." That is, they are used without admixture, unless it be the addition of a little umber or sienna to correct the shade. For this reason there would be no particular benefit in using a pure colour; in fact, there would be a loss, for while the pure pigment might cover a little better than the one struck on a base, the small advantage would certainly not compensate for the increased price. When green is required for tinting, however, those which are strictly pure will be found to be the most economical, and therefore preferable.

It must not be thought that if chrome green, made only of pure chrome yellow and Prussian blue, were used, it would be more durable or lasting than one precipitated on a base, in the manner suggested. It would probably not last so long under ordinary conditions, because the inert base would be absent, while all of the colour itself would be subject to the influences which affect chrome yellow (such as sulphuretted hydrogen) or Prussian blue (such as alkali), both of which equally affects the two when they are made up together to form green. If there is a base of 57 per cent. of gypsum or barytes, it will not be affected by those agencies. A consideration of all the facts mentioned will clearly indicate that purity in paints is not always an unmixed blessing.

Harmless Sophistication of Paints.

The average paint user, whether he be painter, property owner, engineer, or architect, is inclined to look upon both barytes and gypsum as adulterants pure and simple, which greatly lower the value of a paint and render it liable to peel, crack, blister, and "go wrong" generally. But this is all nonsense; there are many thousands of tons of the minerals mentioned that are used in paint every year without the slightest detriment to its lasting qualities. If barytes only possessed body or opacity in the same degree as white lead, it would make an infinitely better paint than that much lauded but poisonous pigment. As barytes is deficient in body, it is necessary to use it with care and in comparatively small proportions. It should be fully understood that in these remarks there is no intention to justify its use in pigments which are sold as pure. If one orders pure white lead one expects to get it, and no sophistry as to a little barytes actually helping the durability can be accepted. We all want to receive what we pay for. Those who imagine that gypsum or calcium sulphate cannot be used under any conditions as a paint, should take the case of Venetian red, which often consists of from 60 to 80 per cent. of gypsum, the remainder being chiefly ferric oxide. Yet this description of red is most durable, and it is largely employed for painting railway carriages. In such a position a paint is of course subject to the most severe tests, not only because of the sand, dust, and clinkers from the engine, which are directed against it, but because of the very frequent washing and scrubbing of the surface of the paint, which is essential in this class of work.

The Conservative Workman.

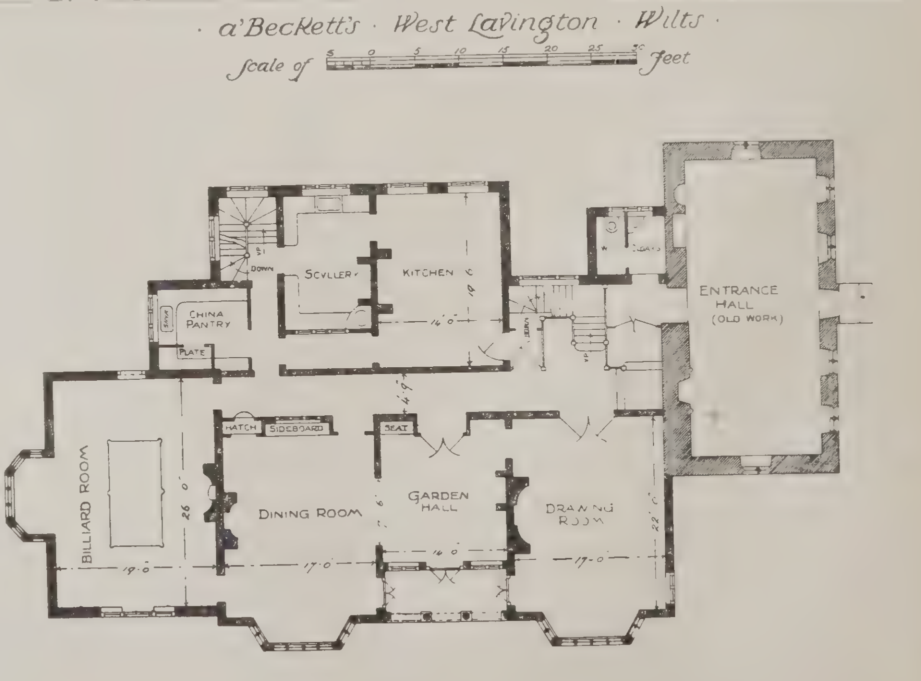
Steel wool, which was introduced into this country some few years since, to take the place of sandpaper, or, to use the more appropriate term, "glasspaper," does not appear to have succeeded so well as its merits led one to expect. This material consists of very fine shreds of steel, which are used in an irregular bunch-like cotton waste, but with this difference, each of the fine shreds has a very sharp edge, and by means of a bunch of the "wool," paint work may be rubbed down to a smooth surface in much less time than it could possibly be done with glasspaper. "Why then," it may be asked, "did not the steel wool succeed?" Simply because it is necessary for the operator in using it to wear gloves, so as to protect the hands, and this the workmen refused to do. It is certain that the average English workman is deplorably conservative in his methods, and hesitates long before adopting any improvement, however great, which necessitates some variation in the method of applying his materials or doing his work, and inventors and manufacturers know this often to their cost. Take for example an ingenious little machine of American origin which is intended to expedite the trimming of the margins from wall paper. It consists simply of a long steel straight edge, affixed to the edge of a table, and the actual cutting is done by means of a long sharp-edged knife, which really forms, when combined with the straight edge, a lengthened pair of scissors. Now, in actual working the paper is first pasted—a practice almost universal in America—the paper is then folded over, so that two pasted surfaces meet, and then the cutting through the two thicknesses of paper is done easily enough. This wall-paper trimmer has had a good sale, but the great obstacle to its general adoption is this—the workmen refuse to cut the paper after it is pasted. They had been in the habit all their lives of cutting the paper dry, and they would prefer—or at least some of them would—to be out of work rather than to change their methods, although it would only involve a couple of hours' close application to become quite expert with the new method. One is reminded of the old joke of the "super" at a theatrical rehearsal, who was told that he must enter the stage from the opposite side, and who exclaimed in great distress, "My word! More study!"

Preference for "the Mixture as Before."

In painters' materials the same condition of things exists to-day. Manufacturers with their elaborate laboratories make expensive investigations and experiments, often extending over years, and eventually place on the market something which it is abundantly clear is a great improvement upon that which has been previously used. The employer may be persuaded to try the new material, but the workmen as a rule condemn it without mercy, for the only reason that it is not to be used precisely in the same way as the material has been in the habit of using. One would think that washable water paints had now been sold and used long enough to have proved their vast superiority to ordinary distemper. Yet, it is probably no exaggeration to say that nine out of ten journeymen painters, if closely questioned, would condemn the improved article and vote in favour of the old-fashioned distemper, with all its smell and other objections. "I don't believe in them new fangled water paints," is the remark that has often been made to me. And enquiry has shown that those who have objected to them have either never actually used them at all, or, if they have, have failed to follow the plain directions laid down for their use.

New Wallpaper Designs.

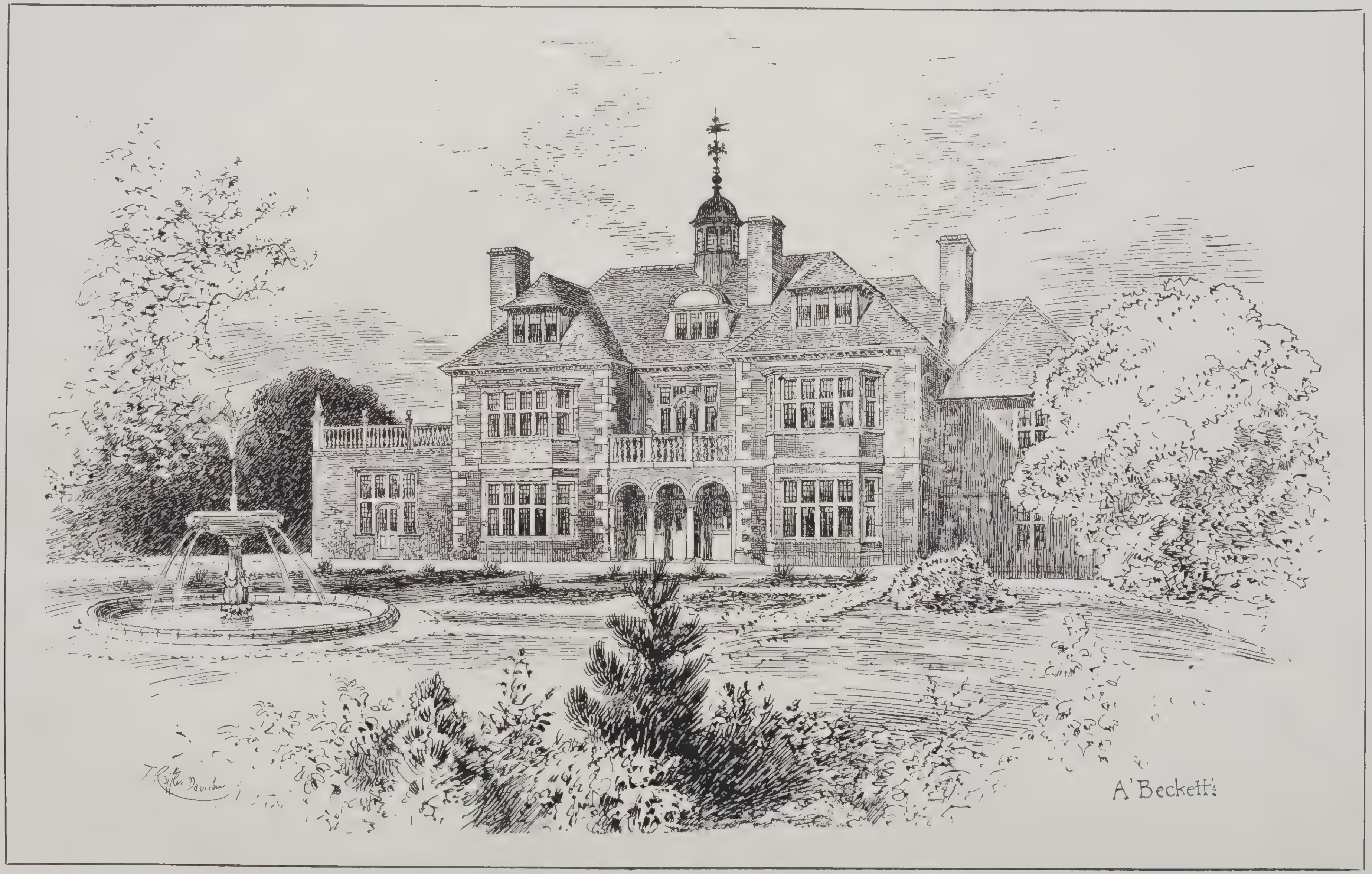
There are some exceptionally handsome designs in wall-paper in the pattern books now being prepared for the New Year, and it is satisfactory to note that the "extension" or "adaptable" series of designs are more prominent than ever. In a number of cases the frieze takes the form of one or more panels separated by suitable ornament, but the panels may be extended or reduced to any size required, according to the size of the room, so that an apartment may be decorated with these papers in a really artistic manner without difficulty and at a moderate expense. Architects are called upon to choose paper-hangings but comparatively rarely—as a rule, only in the case of large houses, where expensive decorations are to be used. Yet a man of good taste might render valuable services to his



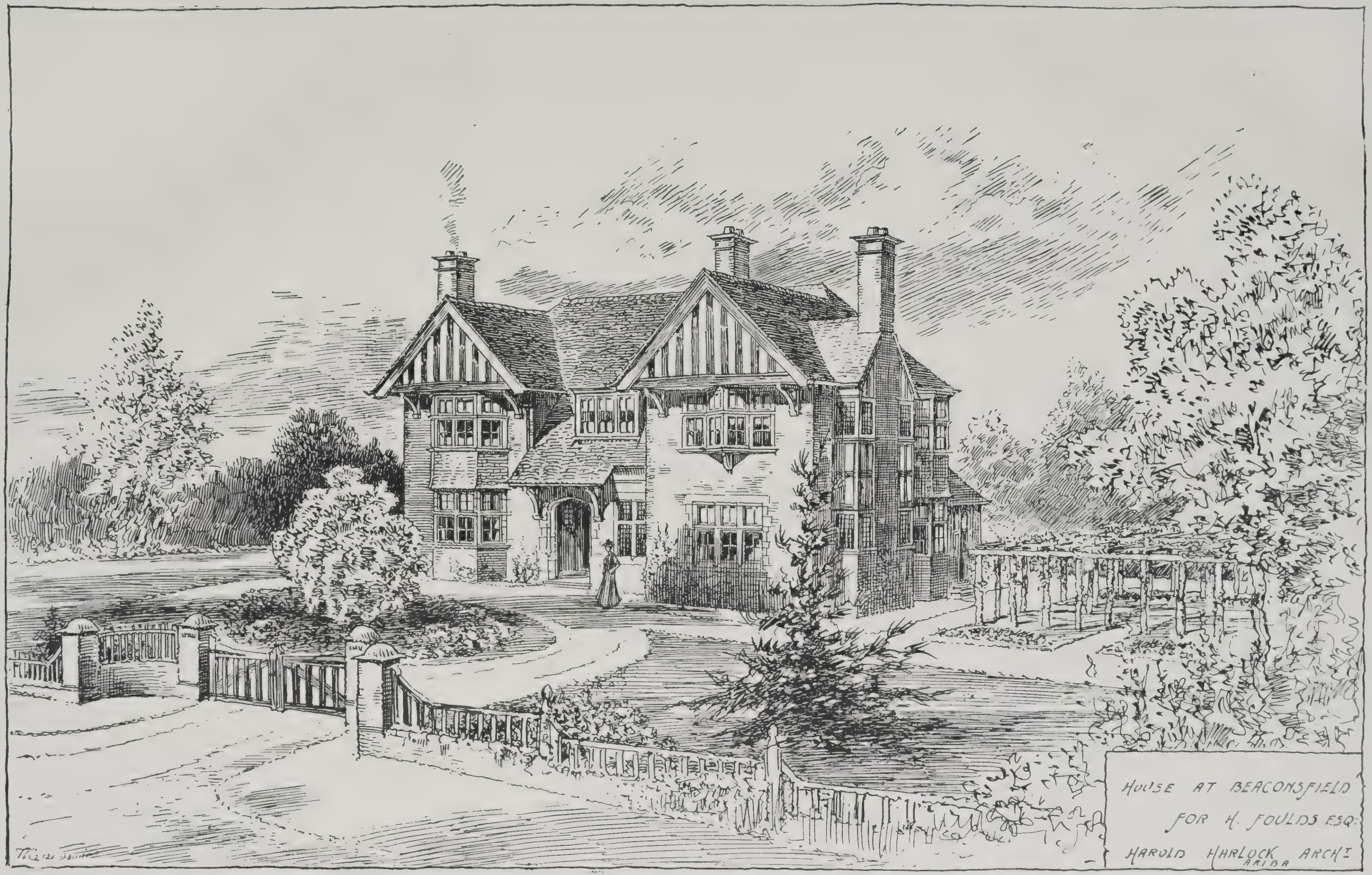
Ground Floor Plan

PLAN OF A'BECKETT'S, WEST LAVINGTON, WILTS. EDWARD WARREN, F.R.I.B.A., F.S.A., ARCHITECT.

(For Elevation, see Centre Plate.)



"A'BECKETT'S," WEST LAVINGTON, WILTS. EDWARD WARREN, F.R.I.B.A., F.S.A., ARCHITECT.



HOUSE AT BEACONSFIELD, BUCKS. HAROLD HARLOCK, A.R.I.B.A., ARCHITECT.

clients if he would, even in the smaller property, lend a hand in choosing the wall-hangings, even though they were to cost but sixpence or a shilling a piece. The custom, of course, is to allow tenants to choose their own hangings, but as a rule tenants are wholly incompetent to make the choice for themselves, and it is much better to finish the walls in some quiet and refined decoration than it is to leave them to the mercy of those who will be almost certain to spoil the appearance of the property by their stupid choice.

Obituary.

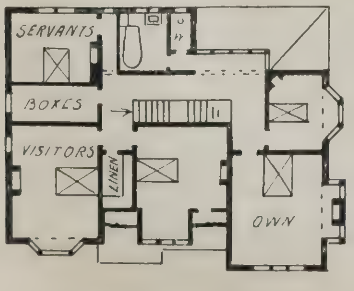
The death took place on September 1st, at Brierley Hill, of Mr. Mark Rollinson, architect and surveyor, after an illness of some two months' duration. Mr. Rollinson was about seventy-five, and was the oldest public servant in the district, having in various capacities held public offices for approaching forty years. He served on the old Local Board, and on the Urban Council (being chairman of both bodies), was for thirty-one years a member of the Stourbridge Board of Guardians, and for twenty years a churchwarden at St. Michael's Church.

Death of Mr. C. F. McKim, of McKim, Meade, and White.

We greatly regret to record the death of Mr. Charles F. McKim, senior partner of McKim, Meade, and White. Mr. McKim died on Tuesday, September 14th, of heart disease.

The firm of which Mr. McKim was the head has built a very large number of important buildings, both public and private, in America, including the magnificent new terminus of the Pennsylvania Railroad in New York, which is now nearing completion, and an exquisite small library for Mr. J. Pierpont Morgan. As Mr. Francis S. Swales remarked in his paper on American architecture, read to the R.I.B.A. last autumn, the publication of the early studies by Mr. McKim for the Boston Public Library, which clearly showed that it owed its inspiration to the library of St. Geneviève, Paris, had a very beneficent influence, and for several years was regarded by architects, as well as by the public generally, as the finest example of architecture in the United States.

In the 'eighties and 'nineties, Messrs. McKim, Meade, and White produced several works in the Italian Renaissance style—the Villard houses and the Century Club; the Madison Square Garden, with the tower similar to the Giralda of Seville, and the "New York Herald" building, by Stanford White. After the Columbia Exhibition, his influence was not less than that of any other of the band whose reputations were made or exalted by this turning-point of the renaissance of American architecture. His influence on the younger men has been enormous; and he was among the first to insist on the restraint and repose in which the architecture of the States was sadly lacking.



FIRST FLOOR PLAN.

Our Plate.

A'Beckett's, West Lavington, Wilts.

This house has been built for Mr. H. Thomas Holloway, J.P., and is situate in Wiltshire, on the site of the house once occupied by the historical A'Becketts. Externally, the walls are faced with small thin red bricks, 2⅛in. thick, and Bath stone dressings; the roof being covered with red tiles (made on the estate, as also were the bricks). By the incorporation of a part of the old house, a charming and picturesque effect has been obtained in connection with the fine oak staircase, the different floor levels of the old and new parts of the house being cleverly arranged. The old portion here mentioned forms a dignified hall of ample dimensions, 33ft. by 15ft. The joinery and floors on the ground floor are in oak, and are exceptionally well executed, whilst the walls of the dining-room and garden hall are panelled, the panels being filled in with fine old Spanish leather. The house is heated throughout by hot-water radiators, and lighted by electricity, the latter being generated on the estate, the plant for which also supplies the motive power for pumps, laundry, and dairy. The architect is Mr. Edward Warren, F.R.I.B.A., F.S.A.

House at Beaconsfield, Bucks.

This house is being erected for Mr. Herbert Foulds, on an elevated site commanding good views of the surrounding country. In arranging the plan, the principal rooms have been placed so as to take full advantage of these views, and at the same time to be sunny and have good aspects. The building will be faced with purple bricks, bands and quoins of a brighter red brick, Ham Hill stone dressings to entrance, etc., and red roofing tiles. The hall will be panelled in pitch pine, stained dark, and the ground floor will have a solid pitch-pine block flooring. The architect is Mr. Harold Harlock, of Ealing.

Great Roke, Witley, Surrey.

This house, which was the subject of our centre plate last week, is now in course of erection, and occupies the crown of a hilly site on the borders of the village of Witley, Surrey. The walling externally is faced with local stone, quarried within two hundred yards of the site, built in random rubble with thin coursed rubble quoins and strings. The dressings for doors and windows are of Doulting stone. The chimneys are of local bricks of excellent colour, and the roofs are covered with hand-made tiles, sand-faced. Messrs. Henry Lovatt, of Darlington Street, Wolverhampton, are the general contractors for the work. The casements and leaded lights and heating arrangements are being supplied by Messrs. Henry Hope and Sons, of Birmingham. Messrs. Buckland and Haywood Farmer are the architects.

Proposed New Works.

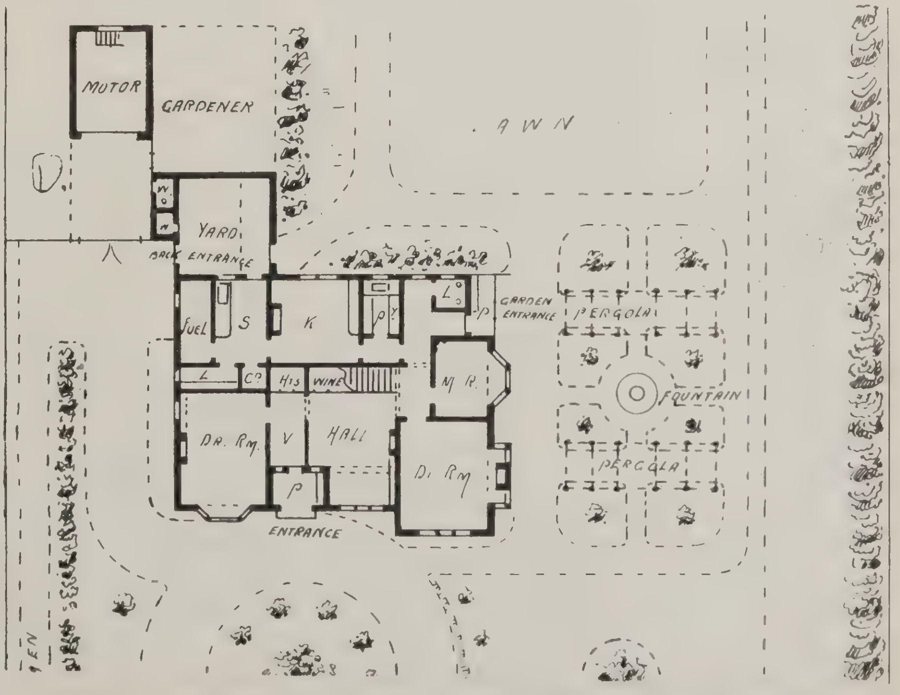
BLACKBURN.—The Town Council have adopted a resolution applying for £80,000 to defray the cost of proposed buildings at Blakey Moor.

EXETER.—The Royal Albert Memorial Committee have recommended to the City Council that application be made to the Board of Education for a grant of three-quarters of the cost of the site and the building of the proposed Day Training College and University extension, including architects' fees, etc. Application is to be made to the Local Government Board for sanction to borrow the sum of money required.

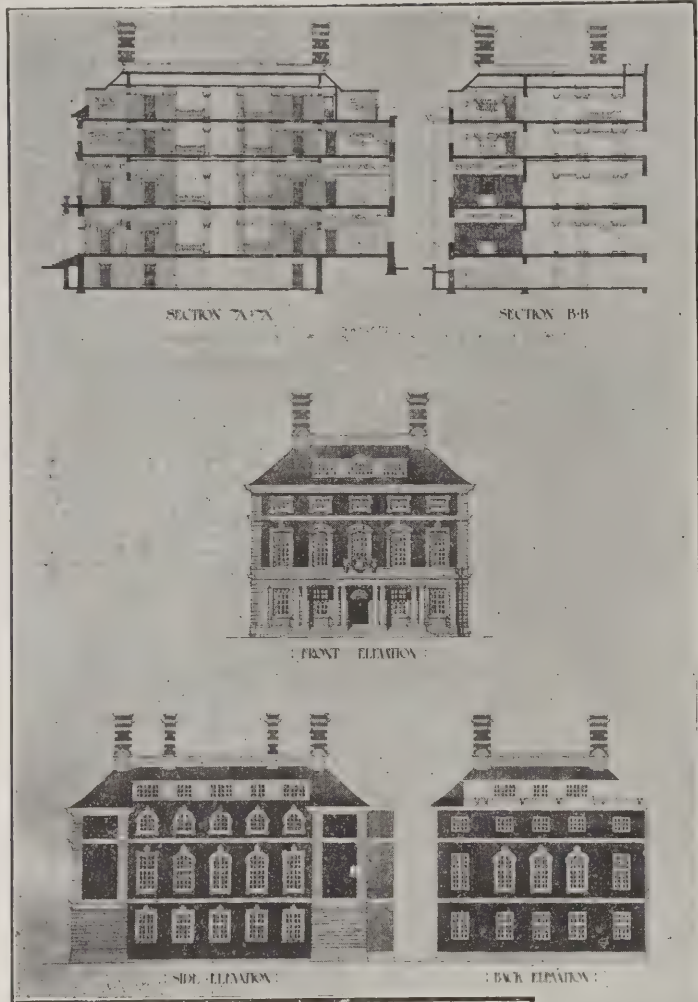
FRIERN BARNET.—The church of St. Peter-le-Poer, Old Broad Street, London, which was demolished a year or so ago, is to be "re-created" here, at a cost of £10,000. The site of the church in Broad Street was sold for £90,000.

HARROGATE.—The Town Council are considering alternative schemes for concentrating the various municipal offices under one roof. One of these is to convert the old town hall, which is now occupied as an Indian art exhibition, into municipal offices at a cost of about £2,000; the other, to erect municipal offices on the site of this town hall, at a cost of £5,000. The Local Government Board, however, seem indisposed to countenance any temporary arrangement, and a few of the bolder spirits in the town advocate the erection of a new town hall, at a cost of about £50,000.

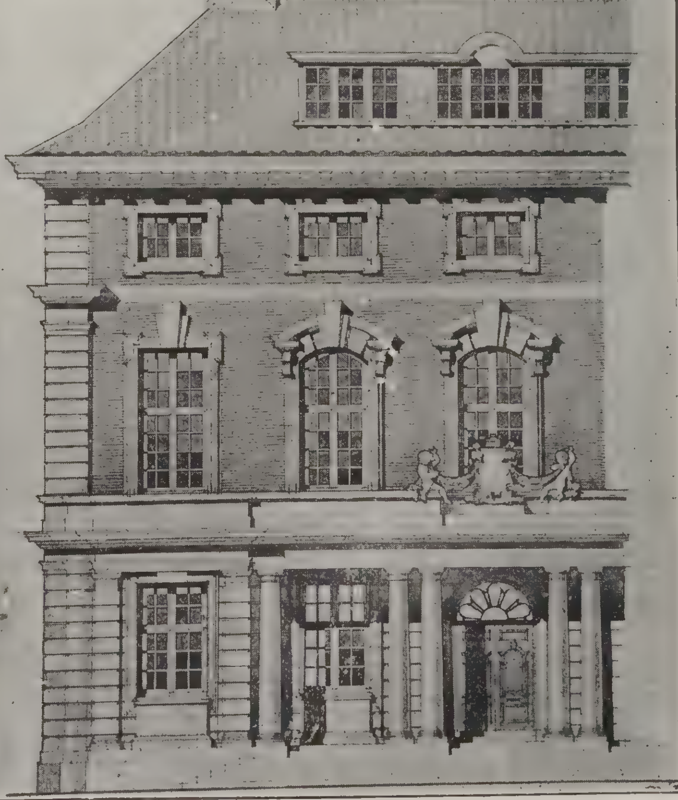
HICKLING.—It is proposed to restore the interesting church at Hickling, which is on the Leicestershire boundary of Nottinghamshire. The fabric is a specimen of the Early English period, but successive restorations have left but little of the original work. The work to be done is mainly in connection with the roof, and is estimated to cost about £720.



HOUSE AT BEACONSFIELD, BUCKS. HAROLD HARLOCK, A.R.I.B.A., ARCHITECT. GROUND PLAN. (*See centre plate.*)



BERKSHIRE COUNTY COUNCIL OFFICES, READING.
ELEVATIONS OF FIRST PREMIATED DESIGN.
WARWICK AND HALL, ARCHITECTS.



BERKSHIRE COUNTY COUNCIL OFFICES. ENLARGED DETAIL OF FIRST PREMIATED DESIGN.
WARWICK AND HALL, ARCHITECTS.
A description of the designs in this competition appeared in our last week's issue.

HILLSBOROUGH.—A new Congregationalist Church for this district is in contemplation, and is estimated to cost £1,900. A site has been secured at the junction of Wadsley Lane and Marcliffe Road.

LAKENHEATH.—The church restoration fund has now reached a total of more than £2,900, and it is proposed to restore the ancient carved oak seats, for which work a further sum of £700 is needed.

LINACRE.—The new church of St. Andrew, which it is proposed to erect here, is estimated to involve a sum of £4,000.

LONDON.—The Departmental Committee appointed to consider the most desirable place for transacting the Quarter Sessions business of London, having found themselves unable to recommend the use of the Central Criminal Court in connection with the work of the London Sessions, it is proposed to consider the district of Newington as a favourable spot for a new building.

LONDON, S.E.—A new market proposed to be erected by private enterprise near Camberwell Green, is estimated to cost over £100,000. It is intended to provide under one roof for the sale of meat, fish, vegetables, fruit, flowers, milk, and general produce. A Bill will be promoted in Parliament next Session for the scheme.

MANCHESTER.—The Manchester Baths, etc., Committee have decided to erect public wash-house and wash baths in Armitage Street, Hyde Road, Ardwick, and building operations are now in progress. The new establishment, when complete, will have 35 washing stalls, 21 wash baths for males, and 22 wash baths for females. The estimated cost is £10,000, and the scheme will be completed in from six to eight months' time.

MARGATE.—The proposal to erect a kursaal having been negatived by the refusal of the Local Government Board to grant a loan of £16,000, the Corporation are desired to submit a further proposal showing the total estimated sum for the purchase and development of the land, when there are reasonable grounds for the belief that the scheme will be favourably considered.

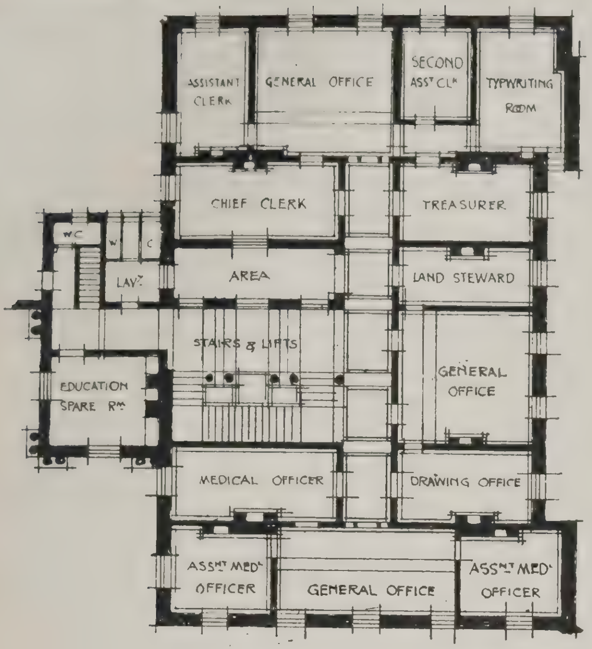
MILL HILL, HENDON.—It has been decided to perpetuate the memory of the late vicar, the Rev. Ernest Bassett Hartley, M.A., by erecting a parish hall at an estimated cost of about £2,200. A site has been acquired, and building developments are rapidly taking place.

MONTROSE.—The Suspension Bridge having been considered to be in need of repair, a report has been made, and is now in the hands of the Bridge Committee.

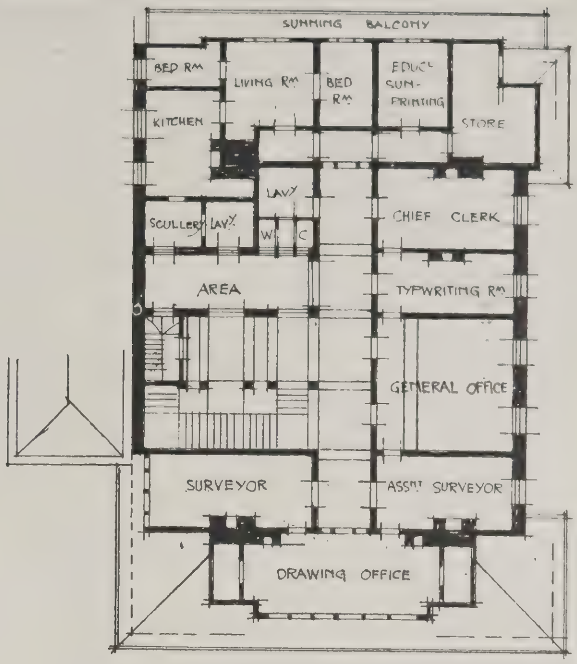
NELSON.—The Baths Committee of the Town Council have decided to recommend the adoption of a scheme for the erection of public baths at a cost of £10,500. At present, Nelson, with a population of 40,000, is without public baths.

PERTH.—Mr. James Miller, A.R.S.A., architect of Glasgow, has submitted a plan for the new infirmary, showing how the site which has been chosen can be utilised for a building with 120 beds at a cost of £36,000.

PLYMPTON.—The condition of the Church of St. Mary is causing much anxiety, the architect, Mr. J. Prynne, having reported that there are several cracks in the tower, which time will naturally widen; part of the parapet of the tower bulges out, one of the pinnacles is considerably out of perpendicular, and the top of another needs attention. The gutters and lead work of the roof require repair to prevent leakage in wet weather. It is estimated that £525 will be necessary to make the more urgent restorations.



SECOND FLOOR PLAN.



THIRD FLOOR PLAN.

BERKSHIRE COUNTY COUNCIL OFFICES. WARWICK AND HALL, ARCHITECTS.

a cost of £60,000, a new bridge, for which plans are now being prepared.

SMETHWICK.—A Local Government Board enquiry has been held at Smethwick Council House, respecting the applications of the Town Council to borrow £1,810 for the construction of a retaining wall at the Rolfe Street depot, and £2,588 for the purpose of sewerage work and street improvements in Hales Lane and Bridge Street.

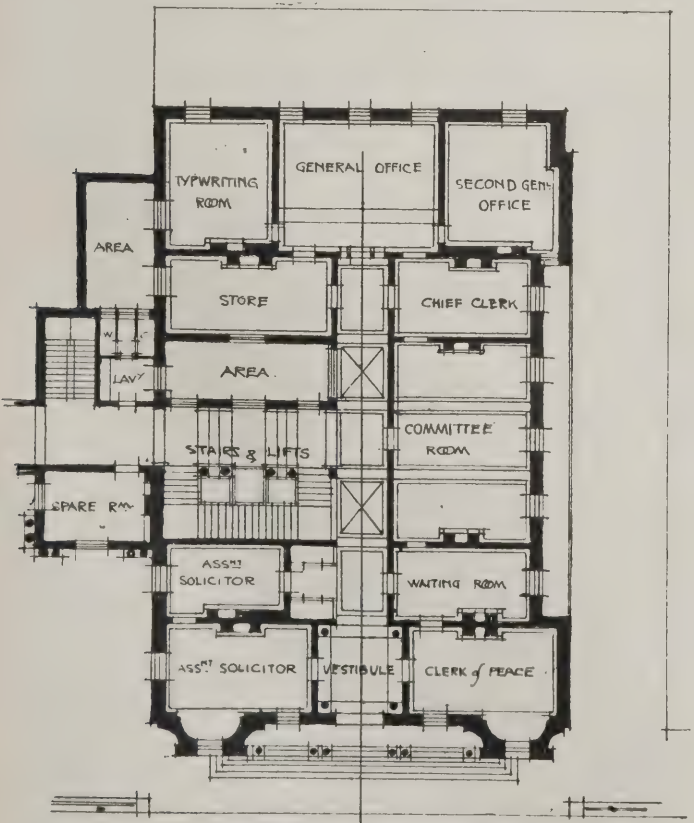
SOUTH SHIELDS.—The Libraries Committee of the Council have decided to approach Mr. Andrew Carnegie with a view to obtaining a grant of £10,000 or £15,000 for the purpose of erecting and equipping a new library.

WAKEFIELD.—The erection of a new school having become necessary by the prevalent state of overcrowding, the Education Committee have decided to requisition the purchase of a site at a cost of £1,500.

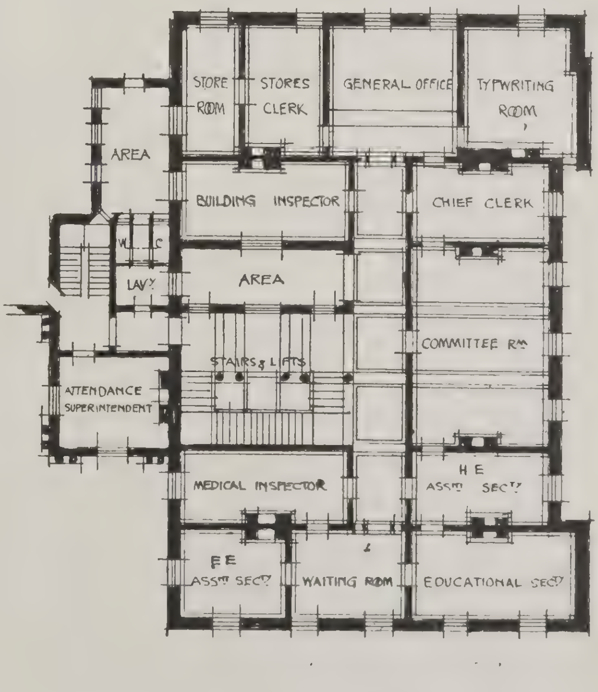
WALLINGTON.—A site has been secured on the Park Hill Road on which it is proposed to erect a new church for the parish of Holy Trinity.

WATFORD.—In this rapidly developing town, church extension has become necessary, and steps are being taken for the erection of a church to cost about £8,000.

WESTON-UNDER-PENYARD.—As a result of a meeting convened to decide whether the existing schools should be retained under the rule of the Church, or whether the erection of a new block of buildings was desirable, the Hereford County Council have been recommended to adopt the latter suggestion.



GROUND FLOOR PLAN



FIRST FLOOR PLAN.

BERKSHIRE COUNTY COUNTY COUNCIL OFFICES. WARWICK AND HALL, ARCHITECTS.

These plans are not photographic, but have been re-drawn from the originals. A photographic reproduction of the basement plan appears on the next page. In reviewing this competition in last week's issue, our contributor described this as "a good symmetrical and economical plan. Access to all parts of the building has been well considered."

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns

Short Formulæ for Reinforced Concrete.

LIVERPOOL.—I. C. writes: "Would you favour me with the name of a small text book on "Short Formulæ for Concrete and Steel Work?"

—We are not acquainted with any publication giving a collection of short formulæ for reinforced concrete. Such formulæ are usually drawn up by specialist engineers to suit their own requirements, and indeed, their methods are not usually divulged. Those who have made a special study of the same, however, can usually draw up satisfactory formulæ, which are just as suitable and are far preferable for practical use to the elaborate formulæ one finds in text books.

Hair for Plastering.

BLACKBURN.—T. A. writes: "Can you give me the address of a firm who supply cows' and goats' hair for plastering?"

—The following are the manufacturers of plasterers' hair:—A. H. Lavers and Co., 103, Wandsworth Road, Nine Elms, London, S.W.; Joseph Robinson and Co., Ltd., 10, Croom's Hill, Greenwich, S.E.; Hutchinson Brothers, 111, Grays Road West, Middlesbrough; Joseph Duce, Lowndes Lane, Stockport.

Kiln Drying of Wood.

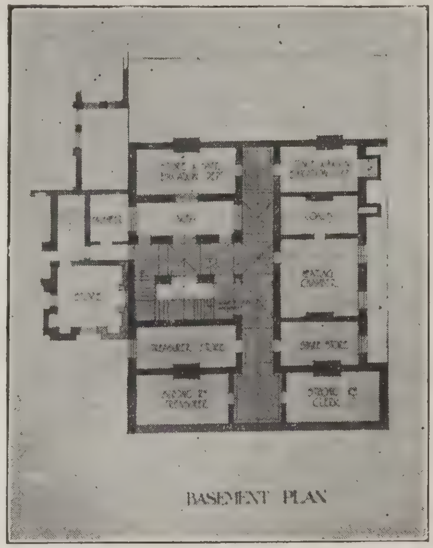
YORKSHIRE. — M. of the Y.H. writes:—"Can you give any information about a cheap system of kiln drying of wood? It will be small in section but require doing quickly. Hardwood mostly."

—It is impossible to offer any useful advice on this point without knowing the internal arrangement of the mill, but the most economical system of kiln drying in vogue in London is that in which hot air pipes (or in some cases, steam) are introduced from the furnace to a brick-built apartment of the smallest possible dimensions consistent with the bulk of the material to be dried. Mills with such drying room usually desiccate for the trade at from £1 to 30s. per standard. Of course the actual cost would be very much less than this where the process is more or less continuous. J. DAVIES.

Quality of Basswood.

Supplementing the information on this subject given a fortnight ago, if a uniform shade of light brown is required, "canary whitewood selected for even colour" should be specified. Ordinary basswood does, however tone down considerably in time, if exposed to air and light, and the colour is then not unpleasantly varied. I have used a considerable quantity of basswood left from the tool, but a caution is necessary as to its use in large widths. It is very much affected by changes of the atmosphere, swelling and shrinking freely from this cause when left unpainted or unstained-and-polished. It should accordingly be used only in fairly narrow widths, and all panels should be left quite free to move, and with a very wide margin, and deep groove in the stiles. Otherwise, when shrinkage occurs, daylight may show through.

G.



BERKSHIRE COUNCIL OFFICES. WARWICK AND HALL, ARCHITECTS.

Rating of Workshops.

SURREY.—COTTERILL writes: "I should be much obliged if you can inform me if a shed erected for use of workmen during the erection of buildings is liable to be rated. I have received a demand for rates on account of a shed used as a carpenters' shop, and should like to know if it is in order?"

—The question raised is not free from difficulty. In deciding whether a particular building is reliable, one has to consider whether it is beneficially occupied. The law is thus stated in a well-known work ("Ryde on Rating," p. 76) that:—"Suppose that promoters are constructing a large reservoir, and build temporary huts for housing their workmen on land specially taken for the purpose, outside the site of the reservoir, and entirely separated from it by a highway, it must apparently be admitted that either the promoters or their workmen are rateable as occupiers of the huts. On the other hand, suppose that the promoters, in constructing a warehouse, use one of the rooms temporarily as a workshop for the carpenters engaged on the works, it would be hardly possible to contend that the promoters are rateable as beneficial occupiers of that particular room." Having regard to this statement, it would seem that a building capable of separate occupation apart from the works which are being constructed, may be rated if beneficially occupied. Hence the carpenters' shed under consideration is probably rateable. But querist will be well advised to resist payment in the first instance, as if the amount is small, the rating authority may not consider it worth while to press the matter if any sort of a fight is shown.

BARRISTER.

Henry VII.'s Chapel, Westminster.

BLACKPOOL.—"PROGRESS" writes: "Please oblige with an account of Henry VII.'s chapel at Westminster."

—Henry VIII.'s Chapel was commenced in 1502 and was intended by its founder to serve as a chantry and contain his tomb. It covers the site of the Lady Chapel of Henry III. and consists of a nave with apsidal end, two side aisles, and five small apsidal chapels. It is approached from the Abbey retro-choir by a broad flight of steps and impressively darkened lobby, with which exception it is detached from the main building and has its own independent west window as at the Lady Chapel at Gloucester. The high vault is supported by 14 turret-shaped buttresses in the aisle walls, with

WHITTINGTON COURT. FROM A SKETCH BY H. TANNER, F.R.I.B.A.

This sketch was made during the fortieth excursion of the Architectural Association, which was to Cheltenham and neighbourhood. Whittington Court is a seventeenth century stone-built house, with tone slates. The sketch is reproduced by permission from the "Architectural Association Journal."

flying buttresses to the clerestory. Practically all the remaining surface is glazed. The whole exterior is covered with a lace-like pattern of minute tracery, and thousands of roses, portcullises, fleur de lys, lions, dragons, and greyhounds. All this ornament had become very much decayed, and was restored by Wyatt in the early 19th century. The interior of the chapel contains many points of interest, chief among them its marvellous fan vaulting—one of the most startling constructive achievements of the Middle Ages. The main traverse ribs form a series of slightly pointed arches, each of which appears to go through a vast circular pendant suspended quite clear of the walls and from which fan tracery spreads over the whole vault. The construction of the vault has been analysed and described by Professor Willis in the R.I.B.A. Transactions vol. I., part 2 (1842). Despite its sensational appearance, it is as sound as any vault can be, but a series of iron tierods was added by Sir Christopher Wren. At the east end of the Chapel stands King Henry VII.'s tomb, the work of Pietro Torregiano, with two finely sculptured effigies of the King and his Consort. This is presumably the earliest introduction of Renaissance detail in England. Surrounding the tomb is a fine brass screen of English workmanship—a worthy fellow to the noble brass gates at the entrance to the Chapel. Mary Queen of Scots and Elizabeth are buried beneath their respective monuments in the north and south aisles. Other Stuart and Hanoverian kings are buried in the Chapel, but without monuments. The double range of oak stalls on either side of the Chapel, with their earlier misereres, are deserving of close attention. Unfortunately none of the original glass, which must have had a large share in the effect of the interior, remains in the windows. A good recent guide to Westminster Abbey by Mr. Francis Bond is published by Henry Frowde, price 1s. net.

R.I.B.A. Examination Questions & Answers.

SUNDERLAND.—E. P. writes:—"Can the numbers of the "Builders' Journal" published in 1906, and containing model answers to R.I.B.A. examinations still be obtained?"

—The issues for July 11, July 25, September 5, September 26, October 17, October 31, and December 5, all in 1906, and each containing model answers to the questions set in R.I.B.A. examinations, can still be obtained from our publishers, 6, Great New Street, London, E.C., to whom application should be made.

Connecting to Main Sewer.

LONDON.—TEMPLE writes:— "A client of mine has four cottages in the S.E. district of London. These cottages are situated in an isolated position, and are drained into a cesspool. There are no other houses in the near vicinity. The borough council have recently brought the main sewer down the road and insist upon these cottages being drained into it, but as the sewer is not low enough to take the drains from the back addition, where are placed the w.c.'s of each cottage, it will necessitate my client re-building the back addition containing the w.c.'s and raising the whole about 4ft. in order to get the necessary fall to the drain. Can my client decline to do this on the ground that as the sewer is, it is not possible for this to be done?"

—It is not easy to see upon what grounds the borough council claim the right to make "Temple's" client alter his existing sewerage system. While S. 23 of the Public Health Act, 1875, permits a local authority to enforce the drainage of undrained houses, that section does not enable a local authority to require an owner to alter his system of drainage, if that system is in fact sufficient in itself (Attorney-General v. Clerkenwell Vestry, 1891, 3ch. 527). In the later case of St. Martin-in-the-Fields (Vestry) v. Ward (1897), 1, Q.B., 40, it was decided that the local authority cannot, under this section, require an owner to provide new drains communicating with a new sewer which they have constructed. It is apprehended from the statement of facts that the cottages in question are old cottages. If not, they may come under the jurisdiction which the local authority may exercise over new houses under S. 24 of the Public Health Act. Having regard to the cases above cited, it would seem that the demand of the borough council ought to be resisted. A solicitor should, however, be consulted, because local authorities are generally well advised when they move in matters of this kind, and heavy expense may result from resistance to their lawful demands.

H.

Society of Architects' Examinations.

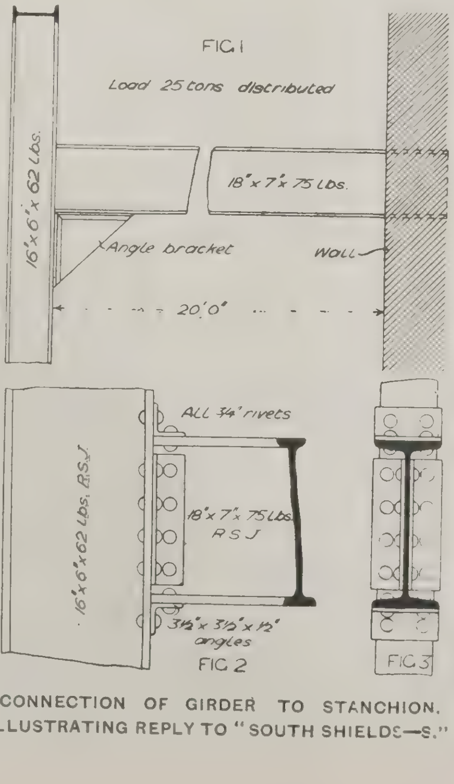
In reply to a correspondent who asks "what text-books are suitable for study to pass the Society of Architects' Examination," Mr. C. McArthur Butler, secretary of the Society, kindly states that his Council have not thought it advisable to continue recommending books, and the list which was published some years ago is out of date to some extent. Mr. Butler thinks that the better way would be for our correspondent to obtain a copy of the syllabus and of the past examination papers, which will enable him to ascertain the lines on which he should direct his studies.

Connection of Girder to Stanchion.

SOUTH SHIELDS.—"S." writes: "An 18in. by 7in. by 75lbs. R.S.J., 20ft. 0in. span carries a distributed load of 25 tons. One end is built into wall, and the other has to be attached to an existing 16in. by 6in. by 62lbs. R.S.J. stanchion by means of an angle bracket, as shown on sketch enclosed. Please show the calculation necessary for the angle bracket attachment between joist and stanchion."

—The sketch submitted being shown in Fig. 1, the building into the wall that is indicated is not sufficient to alter the character of the bending moment, and the ends of the joist must be considered to be simply supported. In order to derive any benefit from building in to obtain a reduction of the stresses, it must occupy a length not less than four times the depth, with a stone template underneath at face of wall and on top at extreme end. The bracket shown to support the girder is of an unusual character, and has quite an unnecessary projection, unless the main object is to stiffen the stanchion against racking. The ordinary mode of constructing the joint would be as shown in Fig. 2 elevation, and Fig. 3 section. It is not usual to have a girder wider than the stanchion, and it is possible that the stresses on the latter have been underestimated.

HENRY ADAMS.



CONNECTION OF GIRDER TO STANCHION.
ILLUSTRATING REPLY TO "SOUTH SHIELDS—S."

INTERNATIONAL TESTING OF MATERIALS.

At the fifth triennial Congress of the International Association for Testing Materials, which was held in Copenhagen, September 7th-11th, Dr. W. Exner said that a reform in some of the methods of testing was urgently needed, and that the question ought to be dealt with by international agreement. He contended that the matter should be made the subject of inquiry by the Governments of all countries interested. A lively discussion followed the presentation of this report, and the matter is certain to attract further attention. In some countries testing establishments are maintained by the State, but in this country the majority of the testing plants are in private hands.

Mr. T. Grut presided over the cement section of the Congress. The report of the committee, presented by the Chairman (Prof. F. Schüle), with its five appendices and its record of experiences gained in the employment of reinforced concrete, is, says a "Times" correspondent, a valuable addition to the practical side of the subject which will be frequently consulted by engineers. There were, in addition, papers dealing with casualties in reinforced concrete building, deformations under service conditions, and the influence of loading upon adhesion between the steel and concrete. The meetings of this section were extremely well attended and a large number of members participated in the discussion. The papers and the reports were presented in the fewest possible words. The discussion turned on matters of principle rather than those connected with detail, the object aimed at being to systematise methods of testing so that experiments carried out in different countries may be made comparable. Mr. C. Rabut, Mr. C. Segré, Mr. Kirsch, Mr. A. Hüset, and Mr. E. O. Sachs were among those who took part in the discussion. The programme for future work is very comprehensive, including a general study of the properties of reinforced concrete by bending-compression and shearing, the physical properties of the material, the influence of external agents, study of accidents and their causes, and practical methods for the testing and the periodical inspection of the material.

At the recent meeting of the International Commission on Reinforced Concrete, 14 countries were represented, and important business was under consideration. One portion of the work to be undertaken relates to the unification of algebraical notation, and other subjects related to tests still required to complete data, and the standardising of methods of publishing reports on such tests, the existing methods of publication being likely to create confusion and make the work of comparison extremely difficult. In regard to uniformity of notation, Continental nations have already reached agreement, and it remains either for Great Britain and the United States to fall into line, or to set up a separate notation for English-speaking countries. Possibly, however, a compromise may be reached. With regard to presentation of test rules, Professor Schüle is to prepare a scheme for consideration. The commission will in future meet at least once in every year. The meetings of 1910 and 1911 will be in Europe, that in 1912 in the United States. Professor Schüle was re-elected chairman of the commission.

A large group of papers was concerned with the progress made in methods of testing cements. Professor Schüle presented the report of the committee and made suggestions for a programme of future work. The experiments at present made point to the simplicity and advantages of testing cements by means of prisms made from plastic mortar, and it is held to be the solution of the question as to equal capacity of the tensile and compression test samples. It also gives to the compression tests the importance they deserve. There was a controversial debate on Mr. Bertram Blount's report, "On accelerated tests of the constancy of volume of cements." The report asked the Congress to recommend the method of Le Chatelier as the standard accelerated test for the constancy of volume. In his own practice, which covers cement of every origin, Mr. Blount has found this absolutely satisfactory to both buyer and seller. The British maker has found no difficulty in complying with it, but the German and American manufacturer have found it somewhat troublesome. After a long debate, Mr. Blount and his committee carried their recommendation, although not without a protest from the German manufacturers and consumers. There was an excellent series of papers on cement in sea water, of which the most notable was one giving ten years' experience in Scandinavia, which was presented by Mr. A. Poulsen.

Correspondence.

The Editor declines responsibility for the statements made or opinions expressed by correspondents.]

Winchester Cathedral.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—No mention has been made, so far as I am aware, in any of the reports relating to the new concrete foundations in progress at this Cathedral, that Professor Willis, at a meeting of the Archæological Association, at Winchester, in 1845, said: "I would like to call your attention to a curious discovery that had been made only recently, viz., that a concrete foundation extending to a distance of about fifty feet from the western portion of the edifice had been laid there evidently with the intention of carrying two large towers. The limits of this foundation had been laid open by the liberality of the dean and chapter, who were anxious to render every assistance in their power likely in any way to assist the history of the Cathedral."

THOMAS POTTER.

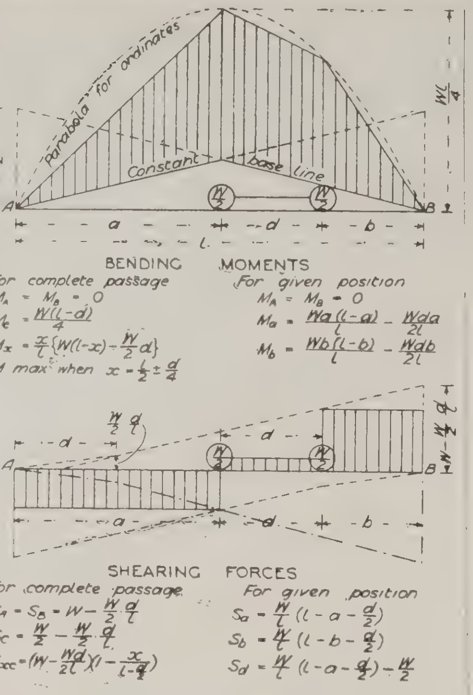
Gantry Girders.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—The solution by "D. W. R.," Edinburgh, in your issue for September 8th, is correct, but not convenient for practical use. I append herewith the full solution of bending moments and shearing forces for two equal concentrated rolling loads over a beam supported at the ends, in a form applicable to any span and any spacing of the loads:—

W = load in tons, l = span in feet, a, d, b, the segments into which the span is divided by the two loads at d feet apart. M_A M_B = the bending moments at A and B respectively. M = bending moment in centre of span, M^x = bending moment at any given distance x measured from left hand support, M_a M_b = bending moments under load at inner end of distances a and b respectively, S_A S_B = maximum shearing forces at A and B respectively, S_c = maximum shearing force in centre of span, S_x = maximum shearing force at any distance from either support to centre of span, S_a S_b S_d = shearing force with given load throughout distances a, b, d, respectively. The stroke-and-dot line is merely the reversal on A, B, of the shear ordinates above the line, and, taken in conjunction with the lower dotted line, and line A B shows how the curves are usually set off for obtaining the ordinates of maximum shear at any point of span. The bending moments and shear forces for the given position of loads are as shown.

HENRY ADAMS.


Parabola for ordinates
Constant base line
$\frac{Wd}{2}$
$\frac{Wl}{4}$
A
B
$\frac{W}{2}$
$\frac{W}{2}$
a
d
b
l
BENDING MOMENTS
For complete passage
$M_A = M_B = 0$
$M_c = \frac{W(l-d)}{4}$
$M_x = \frac{x}{l}\{W(l-x) - \frac{W}{2}d\}$
M max when $x = \frac{l}{2} \pm \frac{d}{4}$
For given position
$M_A = M_B = 0$
$M_a = \frac{Wa(l-a)}{l} - \frac{Wda}{2l}$
$M_b = \frac{Wb(l-b)}{l} - \frac{Wdb}{2l}$
$\frac{W}{2}\frac{d}{l}$
$W - \frac{W}{2}\frac{d}{l}$
SHEARING FORCES
For complete passage
$S_A = S_B = W - \frac{W}{2}\frac{d}{l}$
$S_c = \frac{W}{2} - \frac{W}{2}\frac{d}{l}$
$S_{x} = (W - \frac{Wd}{2l})(1 - \frac{x}{l-d})$
For given position
$S_a = \frac{W}{l}(l - a - \frac{d}{2})$
$S_b = \frac{W}{l}(l - b - \frac{d}{2})$
$S_d = \frac{W}{l}(l - a - \frac{d}{2}) - \frac{W}{2}$

GANTRY GIRDERS.

(See letter in first column.)

THE LARGEST EXCAVATOR.

What is said to be the largest excavator ever built has just been shipped to North Africa, for use in railway building. It has a capacity greater than that of six of the largest steam shovels combined, and is intended for heavy dry excavating. It runs by its own power, travelling on two main traction wheels, each 8ft. in diameter, with a forward steering wheel, which is adjusted vertically to take varying depths of cut. Between this and the traction wheels is the excavator wheel, which is 13ft. 8ins. in diameter, and carries the buckets that do the digging. This wheel has no hub or spokes, but is guided on the inner circumference of two end rings by rollers, and is driven at each side through strong manganese steel chains, which in turn drive a jack shaft carrying sprockets engaging teeth on the sides of the excavator wheel rim. The traction wheels are also positively driven, and through two different trains of mechanism one used when the machine is being driven at relatively fast speed into position for working, and the slower speed when it is being driven forward and cutting. To keep the machine on an even keel when working over uneven ground or in varying soil there is a levelling wheel in the outer end of an outrigger pivoted on one side, and adjustable by rack and pinion so as to right it if it gets out of an upright position. At the back of the machine is mounted a 100-h.p. vertical boiler, together with the engine, which drives all movements except that of the belt conveyer. The latter, which works transversely through the excavator wheel, is driven by its own engine and receives the discharge from the buckets, and delivers it to one side of the machine into a pile or into cars or wagons. In all of the driving, sprocket wheels and chains and gears are employed, no belts being used. Exclusive of the coal-box in the rear, the machine is about 48ft. long over all, and it takes a cut 78ins. wide. The maximum depth of cut at one passage is about 5ft., and in such a cut the machine moves forward at a speed of about 10ft. a minute. The cutting speeds are correspondingly increased with smaller depths of cut, so that at a cutting depth of 1ft. the forward speed is about 50ft. per minute. Otherwise expressed, the capacity is about 325 cu. ft. of material per minute. The machine is the first of its type, and was invented by Mr. C. J. Van Buren, of New York.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Oct. 11.	HULL TRAINING COLLEGE for Teachers in Elementary schools. The Education Committee invites Architects to submit designs. Premiums of £150, £100, and £50 to authors of the designs placed 1st, 2nd, and 3rd respectively. Particulars and plan of site may be obtained of J. T. Riley, Secretary of Education, Albion St., Hull. Deposit, One Guinea, returnable on receipt of *bona fide* design, or the return of particulars within 14 days.
Nov. 30.	HERNE BAY PAVILION ON PIER. Herne Bay Urban District Council invite competitive drawings for a pavilion to be erected on the proposed extension of the pier at a total cost not exceeding £4,000, exclusive of architect's commission. Premiums of twenty-five guineas and ten guineas respectively will be awarded for such two designs as shall be judged of sufficient merit by the Council, and placed by them as first and second; the premium of twenty-five guineas to be afterwards merged into the usual commission payable to the architect, provided the work is carried out by such competitor. Plan of the site and copy of the conditions may be obtained on application to the undersigned on and after the 24th instant on payment of one guinea, which will be returned on receipt of a bona-fide design. Drawings to be deposited at the Clerk's Office, Town Hall, Herne Bay, not later than noon on the 30th November next.—Joseph Jubb, Clerk to the Council, Town Hall, Herne Bay.
Nov. 1.	TECHNICAL SCHOOL. The Corporation of the Borough of Kendal invite architects residing and practising in Westmorland to submit a competitive design, together with a written description and estimate for the erection of a technical school. Premiums of £15, £10, and £5, are offered: the designs to become the property of the Corporation. Particulars may be obtained free from the Borough Surveyor.
Nov. 1.	PRESTON GRAMMAR SCHOOL FOR BOYS. Preston Town Council invite competitive designs and plans from architects practising as principals, for a new grammar school for boys, to be erected in Moor Park Avenue, Preston, and estimates for the same. Premiums of £50, £30, and £20 are offered. The Corporation have appointed a professional assessor. Application to be made to Mr. Alfred Howarth, Town Clerk, Town Hall, Preston, and designs and plans must be sent in by 10 a.m. on Nov. 1.
Jan. 31, 1910.	NATIONAL MUSEUM OF WALES. The Council desires to receive competitive designs for the erection of a new National Museum at Cardiff, Three premiums are offered of £200, £150, and £100, for second, third, and fourth. The Council have appointed Sir Aston Webb, R.A., Mr. John J. Burnet A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A., as Assessors. Particulars and plans of the site will be supplied to competitors on payment of a fee of £2 2s., which will be returned on receipt of a design in accordance with the conditions, or if all papers are returned within 14 days. Inquiries to be addressed to Dr. Wm. Evans. Hoyle, Director of the Museums, City Hall, Cardiff.
No date	WARRINGTON ELEMENTARY SCHOOL. The County Borough of Warrington Education Committee invite competitive plans for the erection of a public elementary school. Particulars on payment of £1 1s. (which will be returned on the receipt of a bona-fide set of plans), from Mr. J. Moore Murray, secretary and director, Education Office, Sankey-Street, Warrington.

Opposition to the proposal of Wimbledon Corporation to erect a new Town Hall, at a cost estimated by opponents of the scheme at £100,000, continues to make headway. Ex-Alderman Penny has been elected unopposed to fill a vacancy in Trinity Ward, with a pledge to oppose the scheme. Penny wise?

THE NATIONAL FEDERATION OF BUILDING TRADES EMPLOYERS OF GREAT BRITAIN AND IRELAND.

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ELECTED MEMBERS.

Northern Centre—T. WILKINSON (Middlesbrough). W. R. THOMPSON (Dewsbury). GEORGE MACFARLANE (Manchester) JAS. STORRS, J.P. (Stalybridge).

Midland Centre—H. WILLCOCK (Wolverhampton). ALBERT S. SMITH (Birmingham).

South-Eastern Centre—WM. SHEPHERD (London). W. F. WALLIS (Maidstone). B. I. GREENWOOD (London). J. BELL, J.P. (Cambridge).

South Western-Centre—Coun. W. N. BLACKBURN (Newport, Mon.). E. J. NEALE (Bristol).

Secretary:
A. G. WHITE, 31 and 32, Bedford Street, Strand, London, W.C.

MONTHLY OFFICIAL REPORTS.

THE NATIONAL FEDERATION.

Dispute at Swansea.

It is reported from Swansea that the dispute with the operative plasterers, which has been in progress for nearly six months, is now in a fair way of settlement. Efforts have been made by a representative of the Board of Trade and by the general secretaries of the Federation and of the N.A.O.P. to obtain a reference to arbitration. Owing, however, to a strong local feeling and to some misunderstanding in regard to earlier negotiations, some difficulty was experienced, but has now been overcome. Rules have been agreed, except as to wages and hours, and it has been agreed to refer these to the decision of a Board of Trade arbitrator.

Organisation at Normanton.

Correspondence has been initiated, which it is hoped will lead to the formation of a builders' association at Normanton. This has come about through the official journal getting into the hands of a builder there, causing him to write for information. Secretaries are requested to note the advantageous use which may be made of the Journal in thus enlarging our organisation.

Collective Purchasing.

The question of collective purchasing of builders' materials is engaging the attention of one of our important local associations, and information on this point has been prepared by the National secretary, and may be availed of by any association.

Housing and Town Planning Bill.

The objectionable Clause 30 of the Housing and Town Planning Bill which called for a quinquennial survey of dwellings below a certain rental, and the provision of a public register of their condition of repair, etc., has been struck out.

New Rules with N.A.O.P.

The new rules with the N.A.O.P. are in the printers' hands, and will be shortly issued, when it will be necessary for the appointment of local joint committees to be proceeded with on similar lines to those existing for the conciliation scheme.

The Conference of Secretaries.

The following subjects for discussion at the forthcoming conference of secretaries have been suggested:—Consider and discuss report of Journal Committee (already sent out), and any recommendations arising. Paper by Mr. Hastings, on "How to Utilise the Official Journal," discussion on "The Working of Conciliation Boards from the Secretary's Point of View" (an opener of this discussion is desired, "Building Trade Organisation in France"), by the National secretary, a paper on "Contracts," by Mr. W. H. Hope, a paper by the secretary of the Scottish Federation (Mr. Cameron) on "How the Conferences have impressed me," "The position of Sub-Trades in the various towns in regard to Membership of Builders Associations."

Meetings of Committee.

The next meeting of the Administrative Committee will take place on Tuesday, October 12th, at the London offices of the Federation. The same evening the annual dinner of the Institute of Builders will be held in London. On the following day it is expected there will be a conference of representatives of this Federation, and of the Surveyors' Association in regard to tenders without quantities.—A. G. WHITE, secretary.

The Northern Centre.

Secretary: James Denver, Cromwell Buildings, Blackfriars Street, Manchester.

Northern Centre Board of Conciliation.

A special meeting of the Northern Centre Conciliation Board was held at the Hotel Metropole, King Street, Leeds, on Monday, September 13th, when an appeal was heard from the Preston local board regarding joiners' wages and working conditions. A notice had been given by the employers for a reduction in wages of 1d. per hour (from 9½d. to 8½d.), against which the operatives had given counter-notice for an advance of 1d. per hour and several alterations to the present working rules, the most important being an alteration to the boundary rule of 1¼ miles radius from the centre of the town, which had now been adopted by all the trades in Preston. After hearing the evidence from both sides, and after several propositions had been disposed of, the following settlement was ultimately carried:—"That the wages of the Preston joiners be reduced ¼d. per hour from (9½d. to 9¼d.); that Rules 1, 3, 7, 9, and 10 be altered as per particulars contained in the operatives' counter proposals to the employers. Rule 6, regarding the boundary, to remain unchanged." It was also decided that the amended rules come into operation as from Saturday, September 18th.—JAMES DENVER, employers' secretary.

Lancashire, Cheshire, and North Wales Federation.

The monthly meeting of the Administrative Committee of the Lancashire, Cheshire, and North Wales Federation was held at the Boardroom, Manchester, on Friday, September 10th, at 2.30, when the president (Mr. W. Cooke, jun.), presided over a good attendance of members.

Mr. W. Deakin, chairman of the Stonemasons' Trade Committee, reported the result of the arbitration in the Manchester masons' dispute, and the report was considered satisfactory.

The accounts for the quarter were examined, and recommended to the Executive Board for payment.

A circular letter was read from the National Federation calling attention to a resolution passed at the half-yearly meeting on the subject of priced schedules with quantities, and the secretary was instructed to reply that the proposal embodied in the resolution is already in practice in this district.

A communication was read from the National secretary with reference to the Conference of Secretaries, and it was decided that a circular be addressed to the secretaries of this district requesting them to submit matters for discussion at the said meeting. It was decided that the conference for secretaries of this district be held in Manchester on September 29th.

Some discussion took place on the report of the "Journal Committee" sent down by the National secretary, and it was ultimately decided to recommend the local associations to support the Journal in every possible way.

It was decided to hold the quarterly meeting of the Executive Board in Liverpool on Monday, September 27th, at 3 o'clock.—JOHN TOMLISON, secretary.

BARNSLEY ASSOCIATION.

Secretary: J. Denton.

The monthly meeting of the Barnsley Federation was held at the King's Head Hotel, on Wednesday, September 8th. The president (Councillor G. Haigh) occupied the chair, the attendance of members being below the normal average.

Important correspondence was read from the secretary of the Sheffield Association re "The alleged infringement of the Fair Wages Clause," by a firm who are members of the Sheffield Association whilst executing their portion of a contract in the Barnsley district. The secretary of the Sheffield Association pointed out in his reply that the section of the works referred to did not come under the heading of "Building"; and moreover, the firm in question did not contribute to the Federation for this portion of their business. The general opinion of the members present, however, was that the particular section of the works in this case did come under the heading of "Building," and that it was a sub-section of a building contract, and was competed for by builders. Astonishment was expressed at the latitude allowing of a firm to contribute to the Federation for a section only of their business. The reply of the secretary of the Sheffield Association in the end, however, was accepted and approved, and, so far as the Barnsley Federation was concerned, the matter was allowed to drop.

A discussion took place on the advantages of insuring the various "building risks" under the Workmen's Compensation Act with the Federation as compared with other companies. The general feeling was that every member ought to insure with the Federation, thus adding directly to its power and financial success. In order to stimulate the interest in Federation insurance, the secretary was instructed to place the subject on the October meeting agenda.

Sanction was asked for and given unanimously for the plasterers' section of the Federation to form a committee in connection with the new rules of the Master Plasterers' Association, and approved by the National Federation.

Notice was given by a member that he would, at the next monthly meeting to be held in October, move the rescission of a resolution passed at the last February meeting. This was a case of a certain business in the building trade changing hands, in which the successor had declined to pay the arrears of subscription and levies due to the Federation from his predecessor, and thus retain his membership. The matter had been discussed at several meetings; and a certain latitude was allowed, an alternative having been embodied in the original resolution that the firm in question be allowed as an alternative to pay an entrance fee and subscription, therefore joining afresh as a new member. The firm in question had declined either to pay the arrears or to adopt the alternative of joining afresh, and the general feeling prevailed among the members, that the alternative should now be rescinded, and the firm in question should only now be allowed to become a member of the Federation by paying up all the arrears of subscription and levies.

A member of the Federation laid a complaint to the effect that a youth had left his employment without any due cause, and that another firm in the same line of business had taken the youth into their employment without making due inquiries as to the cause of his leaving his last master, and although the Federation member had approached the firm in question on the advice of the Federation, he could obtain no satisfaction. The meeting, whilst sympathising with the member, could do nothing further in the matter, the firm in question not being members of the Federation.

SHEFFIELD ASSOCIATION.

Secretary: Thos. Smith.

The monthly meeting was held September 8th, the president (Mr. W. W. Mears) in the chair.

A letter was read from the Town Clerk in reference to the deputation which waited upon the Corporation some time ago, intimating that the views of the deputation had been considered by the Finance Committee, who had agreed to adopt the suggestions put forward, viz.: that Corporation jobs of the value of not more than £100 should be settled within three months, between £100 and £1,000 within six months, and over £1,000 in twelve months. This is a substantial concession, more especially when considered in conjunction with a previous ar-

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rangement which cancelled the system of retaining 10 per cent. of the value of a contract for twelve months, and substituted for it the retention of 5 per cent. for six months, and the balance of 5 per cent. for a further six months

A further communication from the City Council referred to the question of hoardings, which arose out of a police prosecution for alleged insufficient hoardings in suburban streets in the early part of the year. It will be remembered that the Association defended the action of its members, and successfully held that the by-laws under which the prosecution was undertaken did not specifically require a close-boarded hoarding in every position. The information was allowed to be amended, and under the Public Health Act the Council succeeded in proving a technical offence. The matter subsequently formed the subject of negotiation, the result of which is that the Council have issued a new form of hoarding permit, recognising all the contentions of the Association and providing a hoarding suitable for each position, divided into three classes, viz.: (1) Strong and firmly fixed close-boarded hoards, not less than six feet high, (2) strong and firmly fixed post and rail fences, not less than four feet high, with three rails, (3) sufficient firmly placed post and rail fences, not less than four feet high. The first will obviously apply to work to be executed within the city proper, the second to suburban streets, and the third to more remote suburban sites where there is a minimum of traffic. What, however, members have to bear in mind is that a hoarding permit must be obtained in all cases.

A complaint from the Barnsley Association that a Sheffield member engaged in laying out grounds was not paying the standard rate of wages, was considered. The Barnsley Association held that the other competitors for the job were builders, who quoted on the basis of the standard rate of wages, and that the job could not by any stretch of imagination be classified under the head of "gardening." On the other hand the Sheffield member in question, whose business was mainly confined to gardening and rustic building, said that the job consisted solely in the laying out and sowing of lawns, and was distinctly a "gardening" job. Moreover, it was pointed out that the member in question paid a levy to the Association only on the portion of his business which came under the head of building, and such a job as the one referred to would not be considered to come under this heading. The Association therefore felt it impossible to adopt the view of the Barnsley Association.

The treasurer's monthly statement showed the finances of the Association to be in a healthy condition, the subscriptions collected to date being a little higher than for the corresponding period of last year.

A letter was read in reference to the Conference of Secretaries to be held at Leeds next month, and it was decided that the secretary attend same. The secretary mentioned that it was his intention to move a resolution as to the desirability of effecting greater uniformity between the operatives' working rules and the rules of the Conciliation Board, which latter he presumed in the main abrogated the former, but as matters now stood there were in some cases two sets of rules, which prescribed differential methods of procedure in certain cases.

The question of the abolition of walking time in the case of joiners and bricklayers, which has on many occasions been the subject of lengthy discussions, and also two conferences with the operatives concerned, has now reached a head. The negotiations have had no result, and practically ended for the time being with a communication from the operatives to the effect that they had always considered walking time as a substantial advantage, and could only agree to the loss of it on condition that wages were raised ½d. per hour, and that lodging money be paid on all jobs over four miles from the Sheffield Parish Church, at the rate of 6d. per night. To this the Association were unable to agree, and in accordance with the working rules, six months' notice, to expire on March 1st, 1910, had been given: (1) To abolish walking time, (2) to reduce wages ½d. per hour, and (3) to alter any other rule which might be necessary or advisable. Since the meeting the operatives have complained that the third item is indefinite, and contrary to the working rules, and the spirit of the Conciliation Board rules. To this a reply has been sent that the third item is rendered necessary by the fact that rules impinge on one another, and the alteration of the basis of wages would necessarily introduce an anomaly into rules respecting overtime, which would also require to be altered accordingly. Moreover, there is some anomaly in regard to method of procedure. The joiners' rules provide a method of procedure in cases of "disputes," as distinct from a question of alteration of rules, while the bricklayers' rules make no distinction. The joiners' rules provide for the relegation of an unsettled "dispute" to the "central authority of master and workman," and an unsettled point in regard to rules to an umpire, while the bricklayers' rules make a similar provision in regard to unsettled "disputes," but provide no special machinery for dealing with a question of rules, which presumably would come under the same category, although at previous meetings of trade committees an attempt has been made to apply a specific interpretation to the word "dispute." Since these sets of working rules were framed, the Conciliation Board rules have come into operation, and it now becomes necessary to consider what is precisely the machinery to be employed, and consider the advisability of introducing some uniformity between the working rules and those of the Conciliation Board. The matter now stands in abeyance pending a further meeting of the Trades Committees, when the whole matter will be considered *de novo*.

A report was presented embodying the replies of members in regard to the fixing of a uniform standard of profit of 2d. and 1½d. per hour respectively on tradesmen and labourers. The replies were unanimously in favour of the proposal. After some discussion it was decided to leave the matter over until next meeting.

The accounts in connection with the recent visit of Belgian builders were presented, and as far as was possible to make up at the moment, showed a total deficit of nearly £18. It was pointed out that several other gentlemen might yet subscribe, and, in fact, it was reported that some further contributions had been promised. Eventually it was decided to leave the matter over until next meeting, and Mr. Forsdike gave notice that he should then move that the deficit, if any, be then paid out of the funds of the association.

The secretary presented a rough printers' proof of the new telephone calendar for 1910. The design was more artistic than that of last year, the centre being occupied by an ornamental window giving a view in the distance of the tower of the Town Hall. The calendar would be finished in six or seven colours, and some additional space would be provided for advertisers.

A deputation from the Electric Supply Department of the Corporation waited on the association to discuss the apparent objection of builders to the installation of electric light fittings in houses of from £20 to £30 rental. With larger houses, the deputation pointed out, they had no difficulty, and in other cases the only difficulty seemed to be that an electric installation was not provided for, and the tenant could hardly be expected to "wire" the property. They wanted builders to assist them by "wiring" new property, which would not add more than 1 per cent. or 2 per cent. to the cost of a house, and then, with the new lamps, which so greatly reduced the cost of electric light, they were confident they would have no difficulty in

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persuading the tenant to adopt the light. On the other side, it was pointed out that the extraordinary cheapness of gas in Sheffield militated against the general adoption of electric light, and builders did not feel justified in incurring the extra expense. The association were of opinion that if the Corporation wished to experiment in the direction indicated, they should pay for the installation, to which it was replied that some such system had been adopted at Wolverhampton, and if this was the only objection the Corporation might consider the advisability of obtaining powers, but they must first of all know that the prospective consumption would justify the expense. To this it was objected that the Corporation should first of all show prospective consumers the cheapness and all round advantages of electric light before they could hope to materially increase the number of consumers.

Mr. Biggin said it was a wrong assumption to say that builders objected to instal electric light on account of cost, which was less than fixing pipes for gas, but they could not afford to instal both. Moreover, many people had a strong prejudice against the use of electricity on account of the cost, and Mr. Roper said for the present they would still have to put in gas fittings.

Mr. Forsdike foreshadowed the time when electricity, which undoubtedly possessed many advantages, would become the principal illuminant, but if the Corporation wished to push the sale, they must hold out some inducement to builders on the lines indicated.

A most pleasant little ceremony concluded the meeting, when Mr. Biggin, on behalf of the association presented to Mr. A. Mastin (late honorary treasurer of the association) a beautiful carved oak Westminster clock, in recognition of the valuable services he had rendered to the association as treasurer for a period of ten years.

Mr. Forsdike said Mr. Mastin was undoubtedly their most enthusiastic member, and no man had done more to make the association a success.

Mr. Cook also spoke of the enthusiasm Mr. Mastin had put into his work. He had treated the association's affairs as his own, and lifted the funds from practically nothing to the prosperous condition in which they were to-day.

The president also spoke of the extremely valuable services Mr. Mastin had rendered to the association. Mr. Mastin was not present.

WARRINGTON AND DISTRICT ASSOCIATION.

Secretary: Bertram B. Moss.

Referring to the settlement of the joiners' and bricklayers' rules reported last week, the boundaries in both sets of rules have been very much extended, which is a great advantage to the employers. In addition to this, members of the association outside the actual town of Warrington have now been put on an equal footing with those employers actually in the town. Though both branches of operatives demanded an increase of wages, this was successfully resisted by the employers without any upset in the trade, and without the assistance of any conciliation board, as none has been formed in this district.

YORK ASSOCIATION.

Secretary: J. Hague, Solicitor.

A general quarterly meeting was held at the Old George Hotel on Thursday last, September 16th, when the Rt. Hon. the Lord Mayor (Alderman J. Birch) presided over a good attendance. The proposed form of sub-contract, as sent for perusal by the Yorkshire Federation, was discussed. Mr. R. Dent objected to the insertion of clause 3, which enabled a sub-contractor to break his contract on circumstances arising which could easily be merely the result of an oversight on the part of a contractor. The clause, if inserted, might cause endless difficulty, and appeared arbitrary. The sub-contractor had already power, under certain conditions, to break his contract, and in most cases this protection was ample. Mr. Councillor Hardgrave thought there were some things to be said in favour of the clause standing, as sub-contractors frequently suffered under existing conditions. The general opinion of the members, however, was in favour of Mr. Dent's objection. Mr. Councillor Hardgrave, with reference to clause 4, raised a question touching the position of a sub-contractor in the event of the whole contractor becoming bankrupt. It was suggested that the point might be raised by the local delegates to the Federation meeting. On a full discussion of the draft, it was unanimously resolved that, subject to clause 3 being struck out as unnecessary, the proposed form was approved.

Correspondence from insurance companies was read, and the rates and extent of cover were found satisfactory and approved.

The circular letter on the National reserve fund was read and discussed, and it was calculated that our proportion, based on our Federation subscription, would amount to about £5. Mr. Dent proposed, the chairman seconded, and it was carried, that that sum be accordingly sent to the treasurer of the fund as our subscription for the current year.

The question of a breach of rules was discussed, and full explanation was given. It was resolved that the operatives' secretary be written to and informed of what action had been taken, and its result.

The secretary reported that he had been successful in obtaining a rebate for the stonemason members on all memorials, of a certain size, which had been taken into the grounds of the York Cemetery Co. between January 15th and April 1st last, the fees for which had, on the first-named day, been raised, thus causing a loss on contracts (entered into by the local masons) based on the old scale of fees. The secretary's action was approved.

The recent leading article in the "Builders' Journal" on "Builders' Locked-up Capital," and subsequent correspondence thereon, were mentioned and discussed. Mr. Dent said it opened out an interesting and most serious subject. He thought 90 per cent. should be paid up on contracts monthly, with 5 per cent. on completion, leaving 5 per cent. only as retention money. Contractors were often subject to great inconvenience, whilst at the same time being subject to a lien on everything brought on to the job. In addition, there were bondsmen or deposits required, very often up to 25 per cent., and with all this as much as 20 per cent. was sometimes kept back as retention money. He thought provision should be made for 90 per cent. monthly in the agreements. So far as York was concerned, however, the matter did not cause ground for complaint. The members, after discussion, approved and expressed sympathy with the subject matter of the article, and decided that if the matter was brought up by the Federation at any time it would be supported by the local association.

A recommendation as to the provision of papers, lectures, etc., on various subjects interesting to the trade, was approved and referred to the executive to be dealt with. Further recommendations, relative to the encouragement of technical classes for students, and the holding of a whist drive or smoking concert, were also referred to the executive.

Midland Centre.

NOTTINGHAM ASSOCIATION.

Secretary: W. J. Barton, F.C.I.S.

The members of the Nottingham Association had their summer excursion on Friday, September 10th, when 41 members and friends attended. The spot selected was the Derwent Water Works, which the members visited three years ago. The works are being constructed by a Board, constituted by Act of Parliament, which consists of representatives of the Corporations of Sheffield, Nottingham, Leicester, and Derby. The works visited on this occasion were the filter beds at Bamford, and the Derwent and Howden dams. The visitors were much interested in the whole of the works, but especially in the cable ways and concrete mixer at the Howden dam, and also in the construction of the wing walls, which it has been found necessary to build at this dam. The route taken was by rail to Sheffield, thence by coach and fours over the Derbyshire Moors, via Fox House, Hathersage, to Bamford, where lunch was served at "The Marquis of Granby." Various works having been inspected, tea was taken at Ashopton Inn, and the return journey made by another route to Sheffield. The weather was fine, the scenery good, the business interest to builders and contractors exceptional, and these elements combined to make the excursion one of the most successful ever held by the association.

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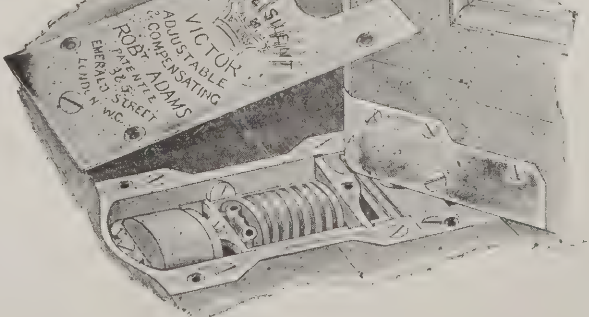

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SCOTTISH BUILDING TRADES FEDERATION.

The fifteenth annual general meeting of the Scottish Building Trades Federation was held in the Caledonian Hotel, Inverness, on September 10th, at 3.45 p.m., Mr. James Leslie presiding.

Minutes of the annual general meeting held on September 18th, 1908, and minutes of the half-yearly meeting of the Executive held April 23rd, 1909, were read and adopted.

The report by the Executive for the past year, and the treasurer's report, were read and unanimously adopted, and the secretary was authorised to have them printed and issued to the members.

Reports on the state of trade that were submitted showed that dulness prevails throughout Scotland.

The secretary reported that the dispute between the Inverness Federation and a firm of plasterers in Aberdeen had been ended satisfactorily.

It was agreed that the secretary should represent the Federation at the Annual Conference of Secretaries, to be held in Leeds, on October 19th.

Recommendation by the Executive that the Federation should adopt a National crest was brought forward and unanimously agreed to, and the secretary was instructed to submit sketch for approval to Mr. Hector MacVinish (Inverness), Mr. T. C. Stocks (Dundee), Mr. David Mekie (Edinburgh), and Mr. James Leslie (Aberdeen).

The report by the Journal Committee of the National Federation was next considered, and resolutions were agreed to.

The secretary then gave a report on the working of the inter-trading rule. He stated that Aberdeen and Edinburgh alone had taken up the matter seriously, and he showed the benefits that had already accrued to the Edinburgh, Leith and District Building Trades Association since their adoption of the rule. He urged the other associations to take the matter up for consideration again.

It was reported that the Perth Building Trades Federation had not been reconstituted since the Federation meeting there in April last, but it was believed that during the coming winter the association would again be put on a proper footing.

The secretary reported the present position with Glasgow Employers' Council. He stated that the affiliated trades in Glasgow are masons, joiners, plumbers, and lathsplitters, and until the other trades joined the Council, Glasgow would not be ripe for federation.

The question of priced schedules being sent in along with tenders was next considered. It was pointed out that this was becoming a general practice, and, on the motion of Mr. Lyall, seconded by Mr. Lownie, the following resolution was unanimously adopted: "That each Federation and local association should, as a matter of principle, instruct their members to refrain from sending in priced schedules with tenders; but, if unable to avoid doing so, should endeavour to arrange locally with corporations, engineers, surveyors, architects, and other public bodies who at present insist upon having priced schedules with tenders, that such schedules should be delivered under seal, and that the schedule of the accepted tender only should be opened, and the others returned to the unsuccessful contractors."

Mr. John Lownie reported that in Edinburgh some architects had introduced an innovation in respect that they inserted jobbing rates in contract schedules. He gave instances where the rates allowed would not cover the cost of the material. The opinion was expressed that such a practice was directly opposed to fair dealing, and, on the motion of Mr. Lownie, seconded by Mr. Mekie, it was unanimously agreed that it be left to each contractor to state his own rates for jobbing work, or, alternatively, to state at what percentage below the local current price list for jobbing work he will do the work.

The chairman reported that while he had been north at Wick and Thurso, he had met several of the local members there, and he thought that their associations would join the Federation if approached. The secretary was instructed to write them on the subject.

The election of office-bearers was next proceeded with. On the motion of the chairman, Mr. Hector MacVinish, Inverness, was elected president for the ensuing year; Mr. David Mekie, Edinburgh, was elected vice-president; both elections were unanimous. Messrs. MacVinish and Mekie will act as representatives to the National Federation *ex officio*.

It was agreed, on the motion of Mr. Slater, seconded by Mr. Farquharson, that the next half-yearly meeting of the Executive be held in Dundee, in April, 1910.

The secretary drew attention to the fact that a good deal of legislation had been before the House of Commons recently, which affected the builders' interests, and suggested that a Parliamentary Committee be appointed to look after such matters in future.

The suggestion was cordially received, and, on the motion of Mr. Lownie, seconded by Mr. Gray, it was agreed to invite nominations for the committee at the next half-yearly meeting of the Executive.

The chairman, on behalf of the delegates present, thanked the members of the Inverness Building Trades Federation for their kindness and hospitality, and after votes of thanks to the chairman and secretary the meeting ended.—JAMES LESLIE, chairman; JAMES CAMERON, secretary, 61, Lothian Road, Edinburgh.

In the report by the executive of the Scottish Building Trades Federation, extreme regret was expressed that the trade throughout Scotland during the past twelve months has been in a bad state. The general trade of the country, however, has very much improved within recent months, and it is believed that an improvement will be felt in the building trade also during the coming year.

Nothing definite has evolved so far in connection with the proposed new scaffolding regulations. Pressure of Parliamentary business of a more important nature has resulted in the measure being left in abeyance. In order that the interests of the Federation may be properly safeguarded, Messrs. James Leslie and George Farquhar, of Aberdeen, with Mr. John Lownie, Edinburgh, have been appointed as a committee to interview the Home Secretary, if thought proper, when the Bill comes up for consideration.

The secretary has been in communication with the new secretary of the Glasgow Employers' Council, with a view to getting that body into the Federation, but matters are not yet ripe in Glasgow for such a step being taken. At present the trades represented in the Glasgow Employers' Council embrace masons, joiners, plumbers, and lathsplitters, but until the other trades come into line there is little prospect of the Council becoming federated with this Federation.

Notwithstanding the decision of the last general meeting not to send the secretary to the National Conference of Secretaries held in London on October 20th, he nevertheless attended the Conference at his own expense. He has been the sole representative from Scotland during the past four years; and as the chairman was in favour of the Federation being again represented at the last conference, the secretary advised the National secretary that he would be present as usual. The educative and instructive value of these conferences is undoubted, and a fillip might be given to organisation generally if each association would send its secretary to attend the next conference, which is to be held in Leeds on October 19th, 1909.

From inquiries made by the secretary, the inter-trading rule does not seem to have been taken up seriously by any of the associations, excepting Aberdeen and Edinburgh. In Aberdeen the plumbers and slaters have adopted the rule, while it has been in force

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in Edinburgh for more than a year with gratifying results. The Executive trust that during the coming year efforts will be made to get the rule adopted by the several associations who have not yet given it a trial.

The adoption of a national crest for the use of the members of the federated associations has been considered. A sketch of the proposed crest has been prepared and submitted to the Executive, who have approved of it and recommended its adoption. If the recommendation is given effect to, it is hoped that every member will provide himself with a crest for use on his business stationery.

It is regrettable that so many of the federated associations have become moribund. With a view to stimulating interest the venue of the half-yearly Executive meeting was changed from Edinburgh to Perth, where the meeting was held in April last. The delegates present from the Perth Association undertook to have their association put on a proper footing again during the winter months, and asked that their association be retained meantime on the list of federated associations. To this request the Executive cordially agreed.

Considerable apathy seems to affect the districts of Dingwall, Dumfries, Alloa, Oban, Banffshire, and Paisley, probably due to the dull state of trade. The associations in these districts are regularly advised of all that is being done, in the hope that with a revival in trade they will be found back taking an active part in the work of the Federation.

There seems to be a growing practice amongst architects to insist on priced schedules being sent in with the tenders. Some action will need to be taken at once to check this tendency.

Another innovation by some architects is to insert jobbing rates in contract schedules. There have been some cases of this in the Edinburgh district during the past year. Representations were made to the proper quarter, but no redress was given, and the matter is about to be taken up with the Edinburgh Architectural Association.

The Executive regret to report that the seven associations in arrear with their subscriptions at the close of the last financial year, are still in arrear. This necessarily means a considerable loss to the Federation, but, notwithstanding, the finances have been well maintained, and there is a good balance in hand. With a revival in trade it is hoped and believed that those associations, once they get properly organised again, will be ready and willing to meet their liabilities.—JAMES LESLIE, chairman; JAMES CAMERON, secretary.

The Royal Liver new building at Liverpool is now sufficiently advanced to afford a good idea of its gigantic proportions; the granite work, for which the stone has been supplied by Messrs. A. and F. Manuelle, of 57, Gracechurch Street, E.C., now showing to the height of the seventh floor.

* * *

Messrs. Patman and Fotheringham, Ltd., Theobald's Road, London, W.C., are making extensive alterations (Mr. Eustace Haynes architect) to the premises of the General Electric Light Co., Ltd., of Queen Victoria Street, E.C.; and the same firm have also just secured the contract for re-building 220-222, Great Portland Street, W. (Mr. Claude W. Ferrier, architect), 11, Waterloo Place, W.).

* * *

The hall of the Cordwainers' Company, in Cannon Street, E.C., which was erected in 1788, is now in course of demolition. Three previous halls had stood upon the same site. The first was erected in 1440, following upon the granting of the guild's first charter by Henry VI.; the second, built in 1577, was destroyed in the Great Fire; and the third, erected in 1670, gave place to the hall which is now coming down, and which will be succeeded by a modern, up-to-date structure from the designs of Mr. Chatfeild Clarke. The building, which had no pretensions to architectural merit, contained little that was of architectural interest.

NEW MUNICIPAL WORKS.

The Local Government Board has decided to hold, or has recently held, as the dates respectively indicate, inquiries into proposed expenditure by public bodies as follows:—Water Supply Works and Plant: Totnes Rural District Council, £400 for Holne (September 23rd); Plympton St. Mary Rural District Council, £4,050 for Plympton St. Mary, and £1,350 for Plympton St. Maurice (September 22nd). Electric Light and Power Supply Works and Plant: Salford Borough Council, £9,500 (September 21st). Sewerage, Drainage, and Sewage Disposal Works and Plant: Llantrisant and Llantwit Tardre Rural District Council, £21,000 for Llantrisant (September 23rd); Headington Rural District Council, £4,263 for New Marston (September 21st); Whitby Rural District Council, £670 for Newholm with Dunsley (September 21st; Salford Borough Council, £30,788 (September 21st); Swansea Rural District Council, £3,900 for Gowerton special drainage district (September 21st). Street Improvement, New Roads, Widenings, Pavings, Public Walks, and Pleasure Grounds: Brighton Borough Council, £2,196 and £5,927 (September 29th); Hendon Urban District Council, £1,682 (September 28th); Topsham Parish Council, no amount stated (September 24th); Torquay Borough Council, £750 and £1,700 (September 24th); Southgate Urban District Council, £5,856 (September 23rd); Barking Town Urban District Council, £750 (September 22nd); Devonport Borough Council, £1,167 (September 21st). Various: Pontypridd Urban District Council, £620 for bridge (September 22nd); Ebbw Vale Urban District Council, £10,880 for housing (September 22nd).

"I.C.S." CELEBRATION DINNER

A dinner celebrating the 18th anniversary of the International Correspondence Schools was held at the Hotel Cecil on Saturday evening last, September 18th. Among the distinguished guests present were Sir Thomas Brooke-Hitching (in the chair), Mr. L. A. Atherley-Jones, K.C., M.P., Mr. A. S. E. Ackerman, B.Sc., secretary, Society of Engineers; Mr. Dennis Hird, Central Labour College, Oxford; Mr. Jas. Adamson, hon. secretary, Institute of Marine Engineers; Mr. T. Costigan, secretary, Institute of Builders; Sir Edward W. Fithian, secretary, Association of Chambers of Commerce of the U.K.; Mr. N. W. Hoskins, hon. secretary, Institute of Sanitary Engineers; Rt. Hon. Col. Mark Lockwood, P.C., M.P.; Col. S. S. Long, Asst. Director of Supplies, Woolwich; etc. At the conclusion of the dinner, the toast, "The King," having been honoured, Sir Thomas Brooke-Hitching, presiding in the unavoidable absence of Lord Montagu of Beaulieu, after paying a eulogistic tribute to the schools, proposed the toast, "The International Correspondence Schools," coupled with the name of Mr. E. A. Seitz, Managing Director of the Institution, who replied. Sir Thomas then proposed the toast, "Education for the Wage Earner," to which Mr. Dennis Hird, M.A., responded, "as one who came from the only democratic college in the Kingdom, owned and controlled by the people." The toast, "I.C.S. Students at Home and Abroad," was then proposed by Mr Atherley-Jones, K.C., M.P., who gave an eloquent vindication of the system adopted by the I.C.S.

Student W. G. Wilson, secretary of the Eccles Spinning and Manufacturing Co., replied. Mr. O. F. Odell, C.A., then proposed the toast, "The Guests," to which Col. S. S. Long responded on behalf of "The Army I.C.S. Students," Mr. J. M. Macdonald, of Messrs. S. Pearson and Son, Ltd., on behalf of "Employers of Labour" and Mr. Geoffrey Adam, in the absence of Mr. J T. Macpherson, M.P., on behalf of "Organised Labour." A musical entertainment, rendered by the I.C.S. Concert Party, brought to a conclusion a most enjoyable evening.

Trade and Craft.

Strand Hotel Sanitary Fittings.

We are informed that Messrs. Doulton and Co., Ltd., supplied the whole of the sanitary fittings in this hotel. A special feature is that a lavatory basin, fitted with hot and cold water, is fixed in each bedroom. These lavatory basins are in polished jaune Lamartine marble, with nickel plated legs, and nickel-plated towel rail, and fitted with glass shelf, etc., for towels. The baths are made of cast iron, white porcelain, enamelled inside and outside, with nickel plated hot and cold fittings. The w.c.'s are the pedestal type; the cistern, flush pipe, and pan are all in white glazed ware. The lavatories for public rooms are in Dove marble, with waste of special design, nickel plated. The ladies' and gentlemen's hairdressing rooms are sumptuously fitted with statuary marble lavatories, with special mixing valves fitted with hand-spray, etc. The urinals and the sinks are in Doulton's special white glazed Vulcanware.

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In the ninth annual report of this company, to be submitted to the tenth ordinary general meeting which is to be held to-morrow, September 23rd, at twelve o'clock noon, at Winchester House, Old Broad Street, E.C., it is recorded that the depression in the building and constructional trades referred to in the last report continued throughout the whole of the past year (the accounts are to June 30th, 1909). This has tended to reduce the demand for Portland cement, and has accentuated the fall in its price. In these conditions the results of the year's trading are considered satisfactory. It is stated that if the main factor which has enabled the company to earn approximately the same margin of profit on its output as heretofore, is the reduction in manufacturing cost brought about by a very considerable outlay of capital upon its principal works. The directors recommend that, as in previous years, a sum of £25,000 be carried to the general reserve and depreciation account, bringing that account to £195,000. The total charge for the year for sinking funds, depreciation, and reserve (including the amount written off patents and the reserve for bad and doubtful debts), will then amount to £61,065 13s. 8d. The profits, after deductions which include £105,737 for repairs and renewals, amount to £337,668, which, with the balance brought forward, amounts to £383,165. An interim dividend on the preference shares was paid on March 31st, and the directors recommend the payment of a final dividend at the rate of 5½ per cent. per annum.

The Cardiff and District Architects' Association were invited, on Friday last, by Messrs. Teather and Wilson, architects, of Cardiff, to view the armoured concrete floors which are now being constructed on the Coignet system at the Newport Road Intermediate School for Boys. The members present were taken over the work, and an explanation was given to them of the methods employed for the construction of floor slabs, beams, pillars and balconies. The contractors for the armoured concrete work are Messrs. Watt Bros., of Cardiff.

* * *

Four new serial issues, "Building Construction," "Carpentry and Joinery," "The Handyman's Enquire Within," and "Woodcarving" are being issued by Messrs. Cassell and Company, of La Belle Sauvage Yard, Ludgate Hill, E.C., each work in twenty-four threepenny weekly parts, commencing September 8th. Judging from the specimen copies that have been forwarded to us, these manuals seem to be admirably adapted for beginners and students, and their intrinsic value, as well as the method of publication, which places them within the means of the poorest pocket, render them a veritable godsend to the ambitious craftsman.

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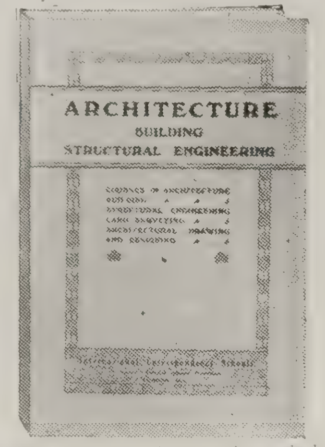

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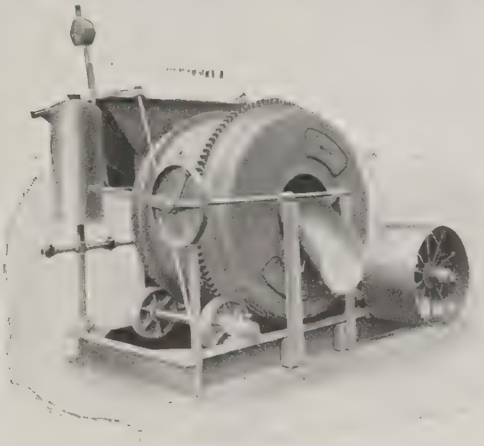

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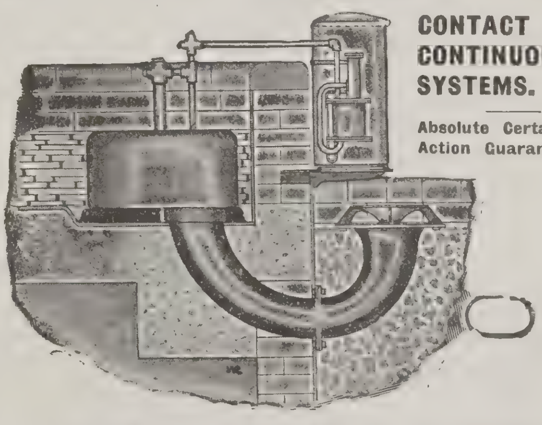

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Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Abergavenny.—Accepted for extensions to girls' secondary school, for the Monmouth Education Committee. Mr. E. A. Johnson, Abergavenny, architect. Quantities by the architect.

J. G. Thomas and Sons, Abergavenny, £1,789.

Almondsbury.—For alterations and additions to Almondsbury Pilning Council school, for the Gloucestershire Education Committee.

H. W. Harris	£2,305	4	8
S. Lovell	2,114	0	0
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J. Browning	1,850	0	0
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W. T. Nicholls, Gloucester ...	1,564	0	0
Byard and Son, Gloucester ...	1,523	0	0
Adams and Jefferies	1,458	0	0
A. G. Heard*	1,443	16	6

Rest of Bristol.
*Provisionally accepted.

Birkenhead.—Accepted for the erection of a Council school in Brassey Street, for the Education Committee:—

P. Rothwell, Birkenhead, about £18,000.

Boscombe.—For the erection of the new library building, for the Public Libraries Committee of the Bournemouth Town Council:—

J. Mitchell	£4,158	10	3
W. Hoare and Sons	3,952	0	0
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Jenkins and Sons	3,553	0	0
J. and W. Hayward	3,487	0	0
F. A. Grigg,* Boscombe ...	3,455	16	11

* Accepted.

Bradwell-on-Sea.—For re-building the Cricketers' Inn. Mr. Rd. Mawhood, Architect, Market Road, Chelmsford,.

F. Weight	£802	0	0
Eglin and Co.	780	9	0
Johnson and Hawkes	755	0	0
Allen and Gowers	717	0	0
J. Rayner,* E. Hanningfield ...	655	10	0

Rest of Chelmsford.
* Accepted.

Carlisle.—Accepted for the erection and completion of ground formation, new roller skating rink (Messrs. Oliver and Dodgshun, Architects, Carlisle):—

William Thomson, Arrar, for the reinforced concrete work and concrete sub-floors.

William Batey and Sons, Carlisle, for the whole of the work required in the super-structure, except the roofs.

Eccles.—Accepted for erection of new secondary and technical school at Park Road, Monton, for the Education Committee. Mr. Henry Littler, County Architect, 16, Ribblesdale Place, Preston.

W. Nicholson and Son (Leeds), Ltd., Hunslet, Leeds, £12,500.

Ilkeston.—For the erection of elementary council schools, Hallcroft, Ilkeston, for 680 scholars, for the Ilkeston Education Committee. H. Tatham, Sudbury, M.S.A., Architect, Estate Offices, Ilkeston. Quantities by architect.

F. Messom, Nottingham ...	£9,250	0	0
T. Barlow and Co., Nottingham	7,878	0	0
F. Perks and Son, Ltd., Long Eaton	7,844	4	6
Bosworth and Lowe, Nottingham	7,615	18	0
W. V. Ireson, Ilkeston	7,595	10	0
W. Maule and Co., Nottingham	7,535	0	0
J. N. Beardsley, Ilkeston ...	7,480	0	0
W. Donnelly and Son, Kimberley	7,407	15	0
F. Martin, Stapleford	7,317	0	0
A. Earnshaw,* Ilkeston ...	7,290	0	0
Architect's estimate	7,453	0	0

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(Tenders continued on page viii.)

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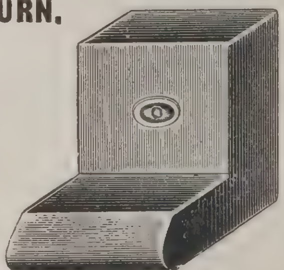

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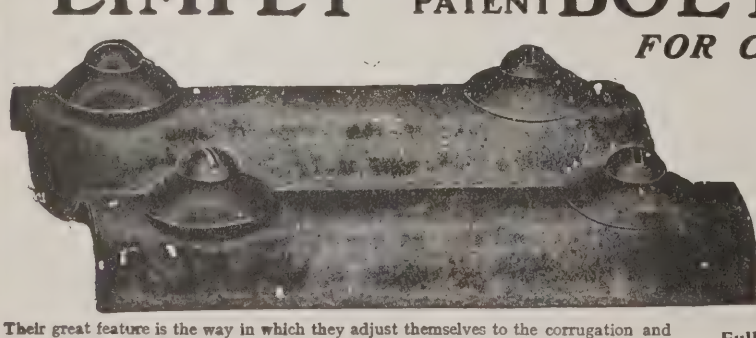

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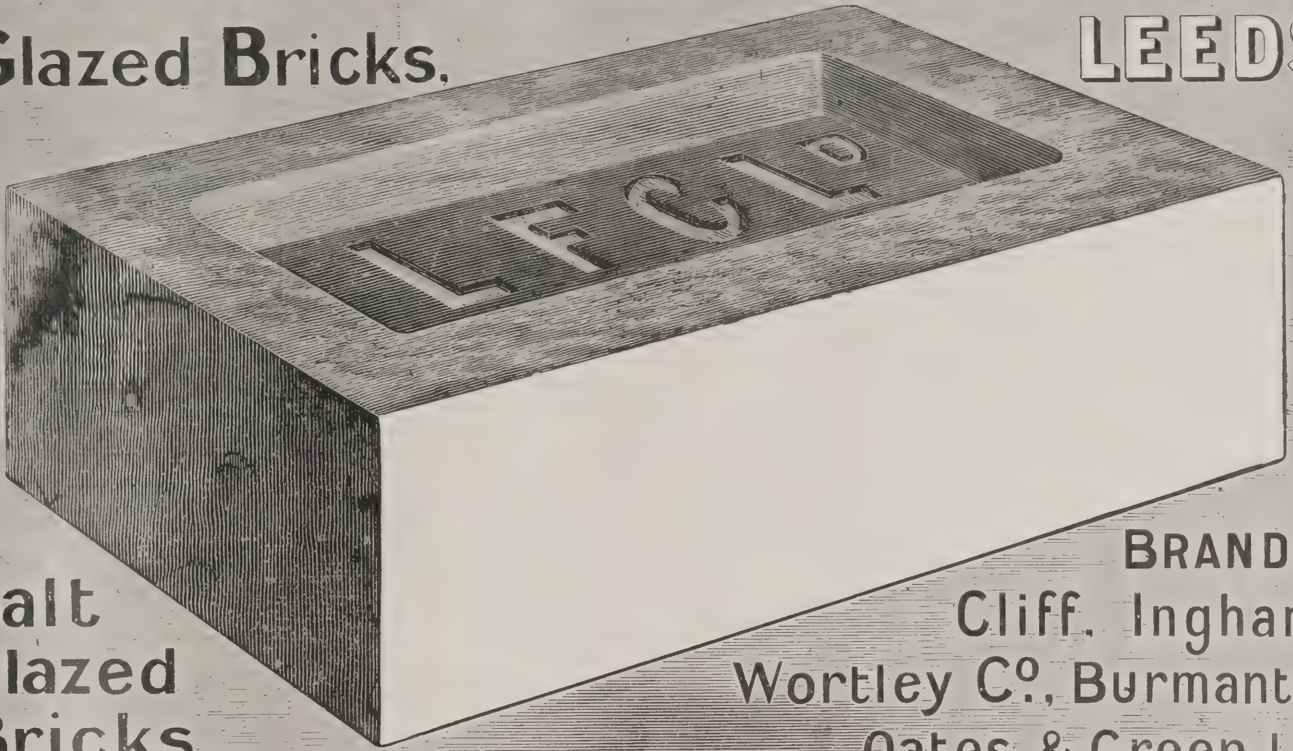

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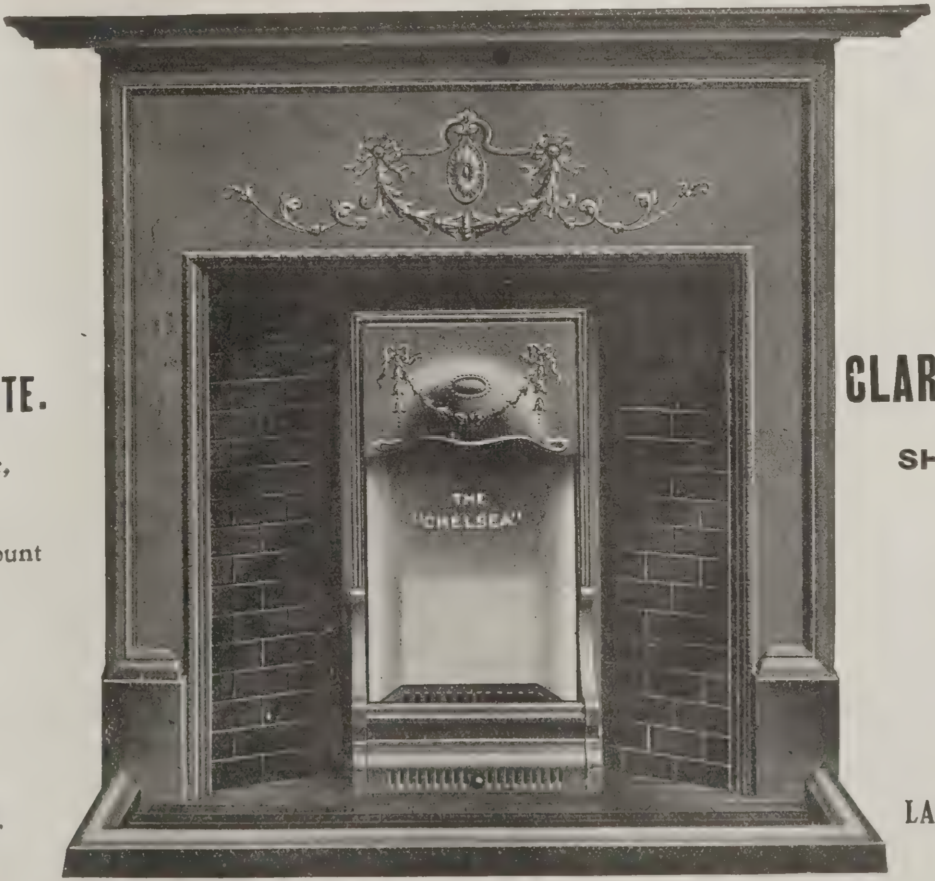

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(Tenders continued from page vi.)

Heywood.—For the erection of a new Primitive Methodist school. Messrs. J. D. and S. J. Mould, Walmersley Road, Bury, Architects. Quantities by architects.

S. Barker	£1,869
J. Twelves	1,860
F. W. Porter,* Bury	1,687

* Accepted.

Mr. Earnshaw's estimate of £60 for footroad on west side of school is also accepted.

Leicester.—For re-flooring, re-seating, etc., Cosby Church, Leicestershire, for the Building Committee. J. Frank J. Goodacre, Architect, Berridge Street Chambers, Berridge Street, Leicester.

W. H. Sharp, Wigston	£400	0	0
T. Herbert, Leicester	380	0	0
G. Toone and Sons, Anstey	368	8	0
J. R. Cooke, Broughton Astley	356	5	0
Scurr, Jowett and Co., Barrow-in-Soar	351	0	0

London, W.—For erection of a new police section house at Beak Street, W. Mr. J. Dixon Butler, F.R.I.B.A., Surveyor, New Scotland Yard, S.W. Quantities by Messrs. Thurgood, Son, and Chidgey, 8, Adelphi Terrace, Strand, W.C.

Higgs and Hill, Ltd.	£10,740
Ashby and Horner	10,653
Prestige and Co., Ltd.	10,576
Lovatt, Ltd.	10,430
Mowlem and Co., Ltd.	10,425
Leslie and Co., Ltd.	10,295
Patman and Fotheringham	10,271
Appleby and Sons	10,247
F. and H. F. Higgs	10,196
Lole and Co.	10,099
Godson and Sons	10,027
Killby and Gayford, Ltd	9,936

Long Eaton.—For new streets, Long Eaton, for the Bonsall Street Land Society. Quantities by Walter H. Woods, M.S.I., Architect, High Street, Long Eaton, near Nottingham.

J. Hutchinson & Son, Leicester	£2,789	0	0
J. Hawley, Ilkeston	2,446	15	6
Perks and Son, Long Eaton	2,188	0	0
John Bull, Long Eaton	2,027	0	0
J. Thraves, Stapleford	2,022	0	0
C. E. Cox and Co., Ilkeston	1,949	5	8
Brown and Son,* Long Eaton	1,919	10	0
Belshaw and Son, Nottingham	1,877	0	0

*Accepted.

Oakfield, I. of W.—For erection of first part of St. John's parish hall, Oakfield. Mr. George Boughton, Architect, Ryde.

T. and E. W. Jenkins, Newport	£697	10	0
J. Newnham	674	10	0
A. P. Williams, Newport	670	0	0
J. Ball and Son, Cowes	£648	0	0
G. Gallienne	605	0	0
F. H. Holland	600	0	0
A. E. Hayden	598	10	0
Wheeler Bros.	597	10	0
J. Wheeler and Sons*	585	0	0
Adams and Mitchell, Haylands	547	18	0
J. Attrill, Sandown	516	12	0

Rest of Ryde.

*Accepted.

Pontywaun (Mon.).—Accepted for extensions and alterations to the county secondary school, for the Monmouthshire Education Committee. Mr. R. L. Roberts, Architect, Abercarn. Quantities by architect.

J. Pritchard, Pontymister, Mon., £1,385.

Saham Toney, Norfolk.—For erection of Saham Toney Hall, Norfolk. Mr. Herbert J. Green, A.R.I.B.A., Architect, Norwich and King's Lynn.

J. Thompson and Co., Peterborough	£10,122	15	5
G. Riches, Cromer	9,425	0	0
Cubitt and Gotts, Ipswich	8,795	0	5
J. Youngs and Son, Norwich	8,247	0	0
R. Shanks, Chatteris	8,054	0	0
J. Cracknell* Peterborough	7,964	0	0

*Conditionally accepted.

St. Paul's Cray.—For additions to Cray Valley Cottage Hospital. Mr. St. Pierre Harris, Architect, 8, Laurence Pountney Hill, E.C.

R. A. Lowe and Co.	£2,400
T. D. Graty	2,377
T. Rider and Son	2,276
T. Knight	2,209
W. Blay, Ltd.	2,175
H. Somerford and Son*	2,025

*Accepted.

Taunton.—For rebuilding the King's Arms, North Town, for Messrs. Starkey, Knight and Co., Ltd. Mr. G. C. Strawbridge, 25, Alma Street, Taunton, architect:—

Gleed Bros.	£1,259	0	0
F. W. Henderson	1,191	9	8
B. Way	995	5	0
F. Small	933	0	0
Vickery Bros.	849	17	6
Moggridge and Sons	849	15	0
J. Maddock,* Taunton	849	0	0

*Accepted.

Weaste, near Manchester.—For the erection of new Church of England Sunday Schools.

J. Bland and Son, Manchester	1,822
Clayton Bros., Poynton	1,805
J. Pennington, Bowden	1,800
Jas. Daniels and Son, Pendleton	1,769
Jas. F. Moore, Eccles	1,743
William Thorpe and Son,* Manchester	£1,735

*Accepted.

Wickford (Essex).—Accepted for detached cottage, Jersey Gardens, Wickford, Essex. Mr. J. Wornell, architect, The Land Co., 68, Cheapside, London, E.C.

Wm. H. Cuming, Hornsey Rise, £200.

Wigan. — Accepted for supply and fixing of switchboards and removal of existing direct-current switchboard at the electricity works, for the Corporation:—

British Thomson-Houston Co., £2,470.

Woolwich.—For erection of open-air wards at the Infirmary, Plumstead, for the Guardians of Woolwich Union. Messrs. Church, Quick and Whincop, William Street, Woolwich, architects:—

E. Mills, Westcombe Hill	£1,655	0	0
G. H. Gunning, Erith	1,596	0	0
T. N. Moss, Southend	1,546	17	6
E. Proctor, Plumstead	1,537	0	0
H. L. Holloway, Deptford	1,483	0	0
A. S. Douglass, Plumstead	1,480	11	0
Stephens and Son, Woolwich	1,419	0	0
G. E. Nightingale, Albert Embankment	1,408	0	0
W. Harris, North Woolwich	1,405	0	0
Thomas and Edge, Woolwich	1,383	0	0
W. H. Hyde and Co., Norwood Junction	1,361	10	0
Gathercole Bros., Norbury	1,355	0	0
Batley, Son and Holness, Old Kent Road	1,345	10	0
A. J. Ware, Plumstead Common	1,343	0	0
J. W. Jerram, East Ham	1,341	0	0
Multon and Wallis, Gravesend	1,341	0	0
H. Kent, Hither Green	1,340	0	0
Sanford and Co., Woolwich	1,332	0	0
F. G. Foster, Norwood Junction	1,224	0	0

Monday, September 27th.

LANCASHIRE, CHESHIRE, AND NORTH WALES FEDERATION OF BUILDING TRADES EMPLOYERS.—Quarterly Meeting of Executive Board, Liverpool, 3 p.m.

Wednesday, September 29th.

LANCASHIRE, CHESHIRE, AND NORTH WALES FEDERATION OF BUILDING TRADES EMPLOYERS.—Conference of Secretaries, Manchester.

Tuesday October 12th.

NATIONAL FEDERATION OF MASTER BUILDERS.—Meeting of the Administrative Committee, at the London offices.

Tuesday, October 19th.

NATIONAL FEDERATION OF BUILDING TRADES EMPLOYERS OF GREAT BRITAIN AND IRELAND.—Conference of Secretaries, Leeds.

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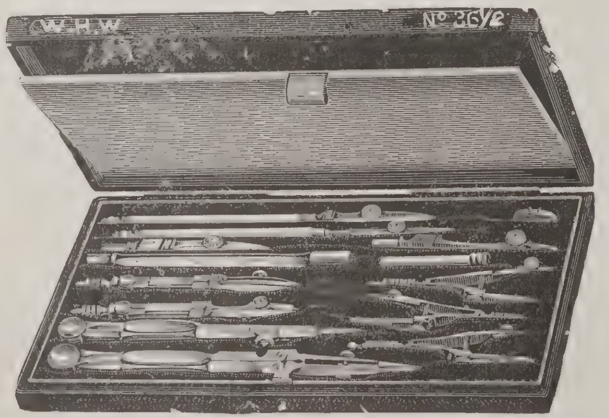

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September 29, 1909. Volume 30, No. 764.

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

This issue contains Articles on Fire-resisting Construction and Fire Prevention.

Caxton House, Westminster.

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Contractual Referees.

Arbitration, or the settlement of disputed questions by a referee, has a well-recognised and important place in the social machinery of our time; so much so that if any business or professional man was asked to name the essential qualities of a referee he would probably say, first, that he should be "independent;" second, that he should be "impartial;" third, that he should be "expert" as to the subject matter of the arbitration. This being so, what must we think of the type of professional mind which can allow itself to be placed in the position of sole contractual referee under circumstances where "independence" is impossible by the very nature of the relationship of the referee to one of the parties to the contract, and "impartiality" out of the question as regards the relations of the referee to the other party. How can a professional man be "independent" of the client who employs him or of the Corporation whose servant he is, and how can he review "impartially" his own acts of omission or commission? We must suppose, however, that in some way professional gentlemen, like town clerks, and architects and engineers employed by Corporations, have convinced themselves that in spite of legal decisions to the contrary, in spite of the anomalous position in which they will be placed, it is their duty, the one to draw clauses in building contracts making the other sole arbitrator, and the other to undertake that function with sublime confidence in his own ability to rise superior to any personal considerations whatever; because several cases of this kind have recently come to our notice. Two are reported by the Yorkshire Federation of Builders in this issue (page 251), and another is being dealt with, we believe, in Lancashire, while a case (Blackwell and Co. v. The Mayor and Corporation of Derby) recently decided in the Court of Appeal before Lords Justices Moulton and Buckley turns on this same question of sole contractual referee. In the course of delivering judgment, Lord Justice Moulton said: Each case had to be raised on its facts. In his Lordship's opinion, where the nature of the dispute arising from the facts which were subsequent to the contract was such that the Court thought the arbitrator was not likely to be able to deal impartially with the dispute, it was open to the Court, and it was their duty, to refuse to enforce the arbitration clauses. In the present case the dispute was as to whether the engineer had not from the first acted unreasonably towards the contractor. Corporations were, in his Lordship's opinion, too fond of putting officers of their own in the position of arbitrators under a contract, and they forgot that as the officer had to perform other duties for the Corporation, there might arise conflicting interests between those duties and his duties under the contract, which might give rise to unfair treatment of the contractor by reason of the zeal with which the officer performed those other duties. In the present case he did not think the case ought to be tried by the engineer whose conduct was practically the sole point in dispute. Lord Justice Buckley concurred, and the appeal was allowed. In regard to the other two cases referred to, we want to draw attention to two points. The first is that in the Hull case, "the Hull Association considered that the sub-contractor had been harshly treated, but having regard to the expense of opening litigation with the Hull Corporation, especially as, by the contract agreement, the City architect was sole arbitrator, the contractors engaged on the work had agreed to share the loss in order that the retention money which had been outstanding for some time might be certified and paid." Here it is clear that *force majeure* prevailed simply because the sum involved was not large enough to provoke a contest, whereas in the Derby case it was. It is just cases like that which probably foster the practice complained of. There are many small oppressions which may be imposed without arousing a contesting hostility; but their aggregate may be quite sufficient to make it worth while to retain the system, and no doubt there are some other advantages from the engineer's point of view in having as free and uncontrolled a position as possible. The other point relates to an instance in which it is stated that "the architect, although a member of the R.I.B.A., used a contract form in which he was appointed sole arbitrator, and by which the contractor became responsible for the accuracy of the quantities." The surprising thing here is that a member of a body which issues a form of contract in which is a fair arbitration clause providing for an independent arbitrator, and a provision for the employment of a responsible quantity surveyor, should not invariably feel it incumbent upon him to adhere strictly to the implied policy of the institute to which he belongs. The matters to which we have referred show that there is room for a very useful reform if the question could be taken up in a friendly fashion by the ruling bodies of the professions and industry concerned, as far as voluntary organisations can control their members. Rules should be laid down and enforced by which professional men should be relieved from such false positions as those referred to, and contractors required to obtain the consent of their Associations at least before signing contracts where the architect or engineer under the contract is also the sole contractual referee.

Architectural Advice Gratis.

It is a far cry from Halifax in Yorkshire to Bombay in India, but these places happen at the moment to be (if the Hibernicism may be forgiven us) connected by two cuttings that lie before us. Halifax Corporation is revising its by-laws, and so is Bombay. In making the revision, Halifax has had the good sense to hearken unto the voice of the associated architects, and so has Bombay. In Halifax, the wisdom of the multitude of corporation councillors has been fortified not only by the collective intelligence of the architects but also by that of the Law Society and the Master Builders' Association. Then, with the aid of the Local Government Board, a new set of by-laws was drafted, and the draft was submitted to the Halifax Architectural Association for criticism. The Association found a few weak spots in the new code, interviewed the By-laws Committee of the Corporation, and obtained a promise that the points raised would be reconsidered. This seems to be quite the most sensible way of concocting by-laws; but a mercenary consideration here insists on intruding itself—ought not these experts to be paid for their skilled advice? But avaunt, Mammon! In Bombay, the advances came from the municipality, which asked the Association of Bombay Architects to send a representative to the meetings of the committee appointed to consider the re-drafted laws. Two members of the Association (one being its honorary secretary) attended sixteen committee and three sub-committee meetings, and most of the suggestions they made were adopted, and, at the close, the following letter was sent to the two architects by the Municipal Secretary: "I have the honour, by desire of the Building By-laws Committee of the Corporation of Bombay, to convey to you the committee's cordial thanks for taking part in their deliberations and for giving them the benefit of your advice." This is very grateful and comforting no doubt; but does it not seem to suggest that the architect is just a thought too unworldly, whether you find him in huckstering Halifax or in bartering Bombay? Of tougher fibre was the architect (in all probability apocryphal) of whom the ancient story is revived in last week's "Tatler." A past Bishop of London called in an eminent architect to advise as to alterations at Fulham Palace. The architect prepared his scheme, but the bishop, seeing that the cost was prohibitive, abandoned the project. "And now," said the bishop, "I shall be glad if you will tell me how much I shall pay you for your trouble in the matter."—"I thank your lordship. One hundred pounds."—"Why, sir," said the bishop, "many of my curates do not receive so much for a whole year's service." —"That may be true, my lord; but you will remember that I happen to be a bishop in my profession." The parallel suggests another: try to imagine a doctor or a lawyer being called in consultation by a public body and foregoing his fees! The thing is inconceivable—monstrous! Then why should architects be expected to give advice gratis?

The Victory of Abigail. A medical contemporary has just discovered that the basement house is obsolescent. It believes that "the day is already dawning in which the basement house will go to join the curfew bell, the dodo, and other relics of the past, in oblivion." We have no lingering doubts about the dodo, but the curfew bell gives us pause. We understand that its brazen tongue still speaks. So, we must admit does that of the area bell, although that and the curfew may appropriately compare their hard cases. It appears that, although a speaker at a recent congress ventured on the distinctly safe observation that "for the ideal city there will be no houses with basements, which help to spread disease, especially tuberculosis," our medical contemporary, with remarkable self-abasement, will not "claim for hygiene the chief word in the beneficent change which is taking place; for though its influence is all on the anti-basement side, the question has already been decided by the economic pressure of the domestic servant," who, "thinking more of her legs than of her lungs," sets her face against the basement, which for that reason is disappearing. Basement houses are avoided by Edwin and Angelina mainly, we suspect, because they look old-fashioned, and because of the untidy and insanitary litter that they harbour; to say nothing of the facilities they afford to "followers" and other undesirables. But they are almost past discussion. It is apparently only in the tall buildings of the United States that further basements are in contemplation; but they are another storey—or rather, several other storeys.

Ramsgate's Late Repentance. Ramsgate seems disposed to indulge in the amusing but not otherwise conspicuously profitable exercise of putting the cart before the horse. Certainly the late Colonel Hoe, who started working as a carpenter, and wound up by working (about ten times as hard) as a millionaire maker of printing machines, declared that one of his secrets of success was to refrain from getting in front of a load and trying to pull it; the more effective method being to get behind it and push it; but this system has obvious limitations, which the municipality of Ramsgate seem to have light-heartedly ignored. It is too much to expect the horse to push the cart. Yet, having built their schools, the Works Committee of Ramsgate Corporation proposed to engage an architect for them, as indicated in the following resolutions: "Resolved, that any complaints as to the manner in which the Lillian Road schools have been built be taken down in writing, and that the Council be recommended to engage a qualified architect, who shall not reside within a radius of fifty miles of Ramsgate, to give his opinion on the subject." The fifty-miles' limit is not the least curious feature of this remarkable resolution, especially in view of a further resolution, to the effect "that the request of the Borough Engineer to be relieved of his appointment for the new Lillian Road infants' school, to which he was appointed by the Council on the 6th May last, be accepted, and that the plans prepared by him be sent to the Board of Education for their approval, and that a local firm of architects be appointed to superintend and carry them out after approval by the Board of Education at a fixed scale of remuneration." This, as a councillor remarked in the discussion on the resolutions, is all very mystifying. "Surely," as another councillor remarked, "if an architect was required he should have been engaged before the schools were completed." Another councillor very justly deprecated any implied slight of the Engineer, "who had devoted hours of overtime in the endeavour to get the schools completed, and had saved the ratepayers something like £600 in fees, which the Council would have had to pay to an architect if one had been employed." Moreover, the proposal to call in the fifty-mile radius architects was actually passed before the Engineer had granted his final certificate; and all the alleged defects—which were merely hinted at in the debate, and would seem from that to have been quite small and ordinary—had since been remedied, and "not one single direct charge had been made to lead the Council to believe that the schools were not built properly." The councillors who had expressed dissatisfaction had given no reasons and made no direct charges. "There had been a lot of mysterious talk, but not one definite charge to lead the Council to believe that they had not received value for their money." If the matter is vague and mysterious to gentlemen on the spot, how much more so must it be to us who are so much beyond that fifty-mile radius? The gentleman who acted as spokesman for those who required the introduction of an alien architect after the job had been completed, himself confessed that the schools had been well and substantially built, so that one can hardly tell what he and his friends would be at. It is risky to attempt any sort of explanation of such recondite psychological phenomena; but we will hazard a guess that the Council, or certain units thereof, are suffering from the prickings of an uneasy conscience. Having saved £600 that ought to have been disbursed in architects' fees, they became anxious to make restitution by sending this conscience-money, or some of it, fifty miles away from Ramsgate. If they had succeeded in carrying their resolution (which was lost), one's rejoicing at so exhilarating an exhibition of poetic justice would have been switched off by the sudden recollection that it must involve a considerable measure of very prosaic injustice towards the Borough Engineer, whose zeal has been at any rate but ill-requited, and whose apparent desire to be relieved of his appointment with respect to the infants' school is, in the circumstances, quite natural; and this experience of the ingratitude of corporations should not be lost on other corporation officials who may be disposed or required to exclude the independent architect.

"Specification": New Edition. No. 12 of "Specification," being the edition for 1909-10, is now on sale, and is to be had at 6, Great New Street, E.C., price 3s. 6d. nett. It is somewhat less bulky than the preceding issue, and this is a distinct advantage. The volume had grown to unwieldy dimensions. In the course of revision, it was found that compression was not merely possible but desirable. This has been accomplished, not by the crude method of ruthless excision, but by resorting to greater intensification, a more thorough digestion of the multitudinous data, which are now set forth with greater clearness and conciseness.

"Specification" is now so widely known as hardly to need introduction or description. At the outset, the aim was to relieve professional men of the laborious and often futile task of consulting a whole library (of indefinite limits and incomplete scope) of technological books in search of the data necessary in the preparation of drawings, specifications, and bills of quantities. This object was so satisfactorily fulfilled, that "Specification" was immediately recognised as an invaluable and an indispensable guide to a vitally important department of professional practice; and its utility has increased with each succeeding issue, until it may now be regarded as a complete compendium of the essential items of a sound specification in every department that can be legitimately included within its scope. It is valuable alike to architects, surveyors, and municipal engineers, and provides a more comprehensive and compact mass of practical memoranda than, it is confidently believed, can anywhere else be found collected in one volume; and, by means of a copious analytical index, any required item can be found instantly, which is an inestimable boon to a busy man. This comprehensivesness has a threefold advantage. It prevents, as we have said, harassing research for items that are perhaps scattered over a dozen volumes, in which they may possibly lurk obscurely and evasively, and that, when at last discovered, are often hopelessly out of date; it tells the professional man all that he wants to know in his own department—not always, it is true, imparting instruction, but often, quite as usefully, refreshing the memory or confirming an impression—and it gives him, in matters that are outside his own particular line, an interesting general survey that conduces to intelligent comprehension and efficient co-operation. Above all, it offers the advantage that it is not a mere text book, which may or may not be in sufficient demand to warrant revision at irregular intervals. "Specification" is actually a periodical, issued annually, and its contents are kept fresh and up-to-date by constant revision, and any suggestions for its improvement are always thankfully received and carefully considered.

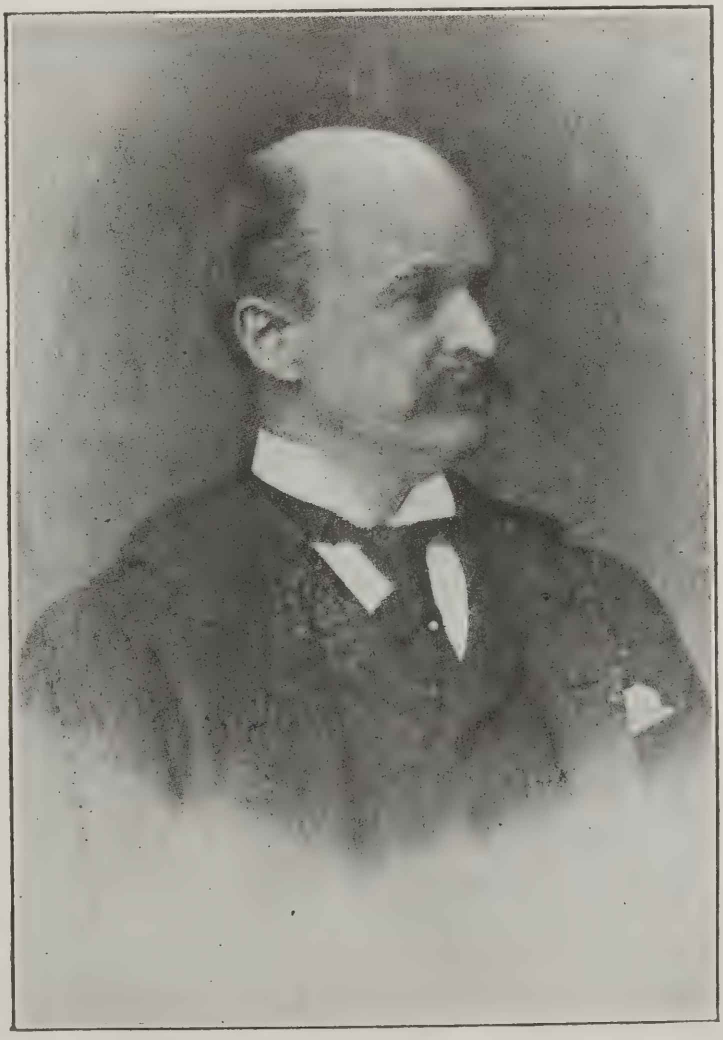
CHARLES FOLLEN McKIM: AN APPRECIATION.

The death of Charles Follen McKim, which, as recorded in our last week's issue, occurred on September 14th, is a distinct loss to the world of Art. He was unquestionably an artist. Born in Chester County, Pennsylvania, on August 24th, 1847, he was educated in the Scientific School of Harvard University, where, when about twenty years old, he took his degree. For the next three years or so he was in Paris, studying in the Ecole des Beaux-Arts and in the Atelier Daumet. Then returning to America, he entered the office of a New York architect, where he met young Mead, who, in 1880, when Stanford White returned from Europe, formed the second name in the now world-famous triple partnership of McKim, Mead, and White.

The work of the firm of which Dr. McKim was senior partner has perhaps exceeded in volume, variety, and aggregate cost, that of any other architect or firm of architects of any era. It includes, as stated by the writer of an important biographical article that is in preparation for the forthcoming issue of the "Architectural Review," from which we are at liberty to quote, "every class of building, in extent, from the tiny bungalow of the late Mme. Modjeska in California, to the vast pile of buildings for the New York station; in style from the rugged and picturesque Casino at Narragansett Pier to the grave and stately library of Columbia University; as to use, from the gates of Harvard University to the skyscraping new municipal offices of the city of New York." Among university buildings the firm's commissions included Virginia, Columbia, New York, with gates and buildings at Harvard, some of the buildings at Brown and Cornell; among libraries, that at Boston, which is one of the best of their earlier designs; of clubs, the University, Metropolitan, Harvard, Lamb's, Freundschaft, and Century in New York, the Mount Royal at Montreal, and the Algonquin at Boston; of Museums, the Brooklyn Arts and Science, the Walker Art Museum at Bowdoin College, Maine; of Government buildings, the new New York Post-office, the War College, the interior designs of the Executive Mansion at Washington, the Rhode Island State Capitol at Providence. The firm built the Nangatuck High School, the Madison Square Garden structures, Boston Symphony Music Hall, the Washington Arch, the New York monuments to Farragut, Cooper, and Hale, the Chicago monuments to Logan and Lincoln, the Battle monument and Cullom Hall at West Point; churches at Stockbridge (Mass.), Nangatuck, Rhode Island, Chattanooga, Tennessee, Morristown; and the Judson Memorial Church and Dr. Parkhurst's church in New York. From an enormous list, only some of the more prominent buildings can be mentioned here. They comprise two of the best buildings at the 1893 Columbian Exhibition of Chicago, namely, the Agricultural Palace, and the New York State building. Their domestic work comprises almost countless residences, among which may be mentioned the Villard, Robb, Morton, Vanderbilt, and Tiffany houses at New York, many town houses at Buffalo, Chicago, Boston, and Washington; and almost countless country houses, notable among which are the houses of Mrs. Elliot F. Shepard at Scarborough (N.Y.), of Mrs. Herman Oelrichs and Mr. E. D. Morgan at Newport (Rhode Island), of Mrs. Clarence Mackay at Roslyn (N.Y.), of Mr. Frederick Vanderbilt at Hyde Park (N.Y.), and of Mr. Ogden Mills at Staatsbury (N.Y.)—all of which might be not inaptly described as palaces. The firm's business buildings and hotels are also legion, and only a few of them can be named, such as the original Imperial Hotel, the Savoy, and the Yosemite Apartment House in New York; offices of the New York Life Insurance Company in New York, Kansas City, and Omaha; the Goelet and Warren buildings, the Tiffany and Gorham shops, and the "New York Herald" and "Judge" buildings in New York; the great Niagara power-house at Niagara Falls (N.Y.), the printing house of the "Cosmopolitan" at Irvington on the Hudson; the Cable building and the huge Sherry's Restaurant at Forty-fourth Street and Fifth Avenue, New York; the Girard Trust Company's bank at Philadelphia; the State Savings Bank at Detroit; the Bank of Montreal in Canada; the National City Bank, the Bowery Savings Bank, and the two buildings of the Knickerbocher Trust Company, one in Wall Street and the other in Fifth Avenue, New York. This catalogue, in its bare enumeration of big buildings of varied character, suggests amazing versatility and resource; and those who have seen the buildings themselves, or merely illustrations of them, admit that in this vast mass of work there is much that is noble, dignified, and truly artistic. The earlier efforts of the firm seem to be based on Hunt and Richardson. Later, Renaissance models were followed, but not slavishly; for, as a writer during that phase observed: "Whatever criticism has been made at length on the use of precedent in their buildings separately considered, it must be acknowledged that the firm of McKim, Mead, and White have always possessed an exact estimate of the value of ancient forms as stimulants to the imagination. Theirs is a method of selection—a choosing of the beautiful and useful, a rejecting of the inartistic and commonplace of former architectures. It is not, as some would suggest, a blind groping after an harmonious effect, but it is marked by the scientific element which distinguishes the artist from the artisan. They seem able 'out of a senseless Nothing to evoke a conscious Something.' Their adaptations have taught them, in their maturer work to add soul and grace to purely modern products."

For much of the merit of these works Mr. McKim must receive the credit. It was he who drew the attention of America to the riches of European architecture, by adapting foreign successes to American needs, especially in the application of Classic and Renaissance design to modern problems. A true patriot, like his father before him—James Miller McKim was an anti-slavery leader—he was above all a true artist. By adopting mural decoration for the halls of Boston Public Library, he may be said to have introduced it to America, and to have made for Sargent, Abbey, and Puvis de Chavannes the opportunities which they have known so well how to make use. He had a fine and true taste in sculpture as well as in painting, and he gave splendid employment to the talent of the sculptor Augustus St. Gaudens, a friend from student days. He gave many opportunities also to Martiny and McMonnies. The beautiful Bacchante, which is now the envied possession of the New York Metropolitan Museum of Art, was commissioned to McMonnies by McKim for the Boston Library, which lost it in consequence of an absurdly prudish objection to the nude by a puritanically prejudiced section of the community. The French Government ordered a replica of this statue for the Luxembourg.

It would not be correct to ascribe to Mr. McKim solely any of the work of the firm. It is safe to say, however, that none of the work ever went through the office without the benefit of his criticism and advice; but, of course, the other partners are to be reckoned with. When Mr. White died, his admirers were disposed to insinuate that the artistic spirit of the firm died with him; but since his death the work of McKim, Mead, and White has undergone no perceptible change of character! and, in fact, the partners worked so beautifully together, and saw things from so similar a standpoint,



CHARLES FOLLEN McKIM.

COLUMBIA UNIVERSITY LIBRARY. McKIM, MEAD, AND WHITE, ARCHITECTS.

that so long as Mr. Mead remains the good work will go on. If it be asked, who took the lead? the answer is, sometimes one, sometimes another; but if there was one who had the final determining word, whose judgment was deferred to by his associates, that one was assuredly Charles Follen McKim.

Mr. Francis S. Swales, from whose memoir for the forthcoming issue of the "Architectural Review" we have been permitted to extract the essence of this appreciation, concludes with the following tribute to the man he was privileged to know: "McKim's life was a full and busy one. Work, honours, distinctions, were crowded upon him; he was not less distinguished as a patron of art, connoisseur, and clubman, than as an architect. He was a friend and patron of Columbia University, and a founder of the American School at Rome. As a benefactor of art in the most material way he took a leading part, and deserved the greatest praise for what he accomplished.

R.I.B.A. EXAMINATIONS AND RECENT MODIFICATIONS.—III.

(*Continued from page 220, No. 763.*)

Subject V.—Specifications, Estimating and Professional Practice.

In this subject a knowledge of office routine and methods is of far more importance than the study of text-books, though something may be done by the latter. Our advice to such candidates as are still assistants is not to be contented merely to do that part of the office work which is allotted to them, but to study at every opportunity the conduct of every "job" from start to finish. The "special" candidate should not need any particular study for this subject if his practice is of a varied nature, but he should note the fact that questions often involve a detailed knowledge of special trades, and nearly always necessitate a sound and clear knowledge of practical construction and of materials old and new.

Section VI.—Construction (General).

Here it was necessary to answer four out of five questions, and the compulsory question was not quite of the usual type, perhaps, but still involved, as is usual in this question, a somewhat advanced knowledge of modern foundation construction, added, in this case, to a practical acquaintance with modern requirements in town buildings.

A note of warning may be usefully given. It is not sufficient to merely make your foundations and walls strong and secure: you must at the same time bear in mind the purse of your imaginary client. Economy is often as important as strength in construction, even in an examination question.

Lack of sufficient speed in working is, perhaps, the most frequent cause of failure. In this instance many candidates became engrossed in the first question to such an extent that justice could not be done to the remainder of the paper. This should be guarded against most carefully. Remember that it is not necessary to make complete or finished drawings, but only to display to the examiner your knowledge of the requirements. Avoid all repetition and concentrate your attention upon the salient features of the problem: allot a certain proportion of time to it, you can return to it if time permits at the end. It is to be noticed that the questions are generally not such as can be obtained direct from a text-book; practical knowledge is essential. As a rule the most important part of a constructive problem is in the jointing of the various parts, and this must usually be most clearly shown.

Section VII.—Construction in Iron and Steel Shoring, etc.

Though still urging the importance of observation, and taking illustrative notes of interesting pieces of practical construction in steel and iron, we believe that in this subject the knowledge obtained from text-books is of greater importance than in any other. We are here dependant upon theory to a great extent, and in so far as this point is important, we may refer our readers to the remark made upon subject V. in the Intermediate examination, as they apply in this case for the most part.

The paper set this time differs but little from previous papers except that perhaps the knowledge required is a little wider and less stereotyped, and the questions, as they have for some time tended to be, a little more complex. The shoring questions numbers 3 and 4 alone, perhaps, hardly illustrate the truth of this statement. Both could be readily answered from the illustrations in "Stock's Shoring and Underpinning." The mechanics of shoring is, as usual, not touched upon.

Even in this subject there is a great advantage in ready and quick sketching, and in both construction subjects the style of sketching is of some importance; it should never be laboured, and should in all cases be practical. It is generally left to the candidate to choose his methods of calculation, but probably the advice given to Intermediate candidates as to the choice of formulæ may be safely given here. The additional knowledge required in the Final mainly consists in such as can be obtained most readily by reference to the steel manufacturers' booklets, and the habit of observing the naked steelwork which abounds in all large cities, especially when in course of erection.

We cannot complete our remarks more appropriately than by urging the point emphasised in the advice to candidates given in the Kalendar, viz., at all times to carry a note book, and whenever an interesting point, whether æsthetic or constructive, is observed, to make a sketch.

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ELECTRICAL HOUSE WIRING: SOME RECENT DEVELOPMENTS, WITH A GLANCE AT FIRE INTERESTS.

A Rapid Change.

During the last two or three years the whole aspect of electric lighting as applied to interiors has undergone considerable changes. Progress has been rapid in many directions, and the general result has been to cheapen the cost of electric light and to bring it within the reach of many who previously could not afford its advantages.

Cheaper Light.

The principal improvements, taking them in chronological order, are the applications of the science of illuminating, engineering, the invention of metallic filament lamps, and the designing of new wiring systems. With the two first it is not now proposed to deal, except to note in passing that their effect to the consumer has been largely to reduce the cost of current, whilst providing a more pleasing form of illumination. To the electricity supply authority, on the other hand, they imply reduced revenue. In searching for fresh consumers to balance the losses, it became evident that there were many who could afford to pay for electric light, now that it is as cheap as gas, but who were still debarred from its benefits owing to the high cost of installing the wiring. This at once created a demand for a less expensive method of wiring—a demand which had always been dormant, but which could not previously be met owing to prohibitive rules.

New System of Wiring.

The electricity supply authorities having, however, relaxed their conditions from sheer necessity, new systems of wiring have recently been made available, by which the first cost of installing is reduced by a relatively large amount, so that the prospective small consumer is now in a position to obtain, and maintain, what was previously a luxury. It is proposed to describe briefly in these notes the more important of these new systems.

Wood Casings Obsolescent.

Formally, wiring was carried out mainly by laying the insulated wires in wood casings, or by running them through steel barrel, or by a combination of both methods. Wood casing is unsuitable for concealing beneath the plaster, as it affords little mechanical protection to the wires, and also because it necessitates too much cutting away and making good; therefore, it had to be run on the surface, and, if properly run; involved considerable expense,—this qualification including good joinery and æsthetic arrangement. Otherwise, there is little to complain of in regard to the wood casing method.

Steel Barrel,

on the other hand, has been proved, after many years, to have certain disadvantages, apart from the expense involved if this system is erected properly. The ordinary thin slip-joint tubes corrode in time, and also do not provide for an efficient electrical continuity (so important a factor of safety), in spite of the many continuity grips, etc., that have been devised. Heavy screwed barrel, however, whilst not deficient in electrical continuity, is expensive, and involves the use of expensive fittings; and in steel barrel of any kind, water, from moisture condensed from the atmosphere, collects, and in time rots the insulation of the wires.

The "Kalkos" Conduit System.

For those who can afford to pay for a conduit system, that known as "Kalkos" is excellent. In this system the barrel is of tinned brass, light gauge, and all the fittings are of the same material. Brass, by reason of its better heat-conductivity, combined (in this case) with the small amount of metal employed, does not condense moisture from the atmosphere, and, in consequence, the insulation of the wires does not perish. In addition, efficient electrical continuity is obtained by applying a stick of solder and a blow-pipe flame to every joint during the erection of the system, so that all the joints are soldered.

The Fire Offices and a Continental System.

In regard to cheaper systems, however, there was one which has been in use on the Continent for many years, but was not approved by the fire offices and other authorities in this country—namely, the Surface Flexible system. This consists essentially of heavily insulated twisted flexible wires, secured to insulators fixed on the walls and ceilings. The attitude of the fire offices was anomalous, because they permitted much smaller flexible wires to trail along the floor from wall plugs, where they could be trodden on at any time; and besides, there is much less danger, in case of a fault, if the wires are in full view and accessible. Another anomaly is that small flexible cords are permitted to take the weight of electrical light fittings. In Germany this is not permissible, a steel wire being employed in addition, for the purpose. The real objections to the Surface Flexible system are that the wires are unsightly, deposit dirt on the walls and ceilings owing to electrostatic action, and have to be pulled down in case of re-decoration. But these objections are of small account to the class of consumer whose custom was required by the electricity supply authorities. Several of the latter, and also some fire offices, will now pass this system, and it is also permitted by the wiring rules of the Institution of Electrical Engineers.

The "Facile" Lead Wiring System.

A system that involves very little new in principle, but only in detail, is that known as the "Facile" lead wiring system. It consists essentially of joint boxes and accessories of special design, by which lead-covered wires

TIFFANY HOUSE, NEW YORK. McKIM, MEAD, AND WHITE, ARCHITECTS.

RHODE ISLAND STATE HOUSE, PROVIDENCE, RHODE ISLAND. McKIM, MEAD, AND WHITE, ARCHITECTS.

(twin and triple) may be run in an economical manner. Such wiring is not new, and has been used in the past to a large extent, but formerly there was no proper provision for earthing the lead, and looping had to be employed at considerable expense. In the "Facile" system, china joint boxes are employed and arranged in such a manner that one box is required for each light point separately controlled, and for each group of lights controlled by one or two switches. Starting from the fuse board, each circuit consists of a twin wire, which runs to the nearest joint-box and then from box to box up to the full number of points in the circuit. A twin wire is run from each box to the light point, and another to the switch point. All wires entering a joint box have their lead sheathings connected by means of an "earth plate," and a similar plate is situate in the fuse-board, which is connected by a wire to an "earth clip" on the lead sheathing of the mains. The other end of the mains is connected in a similar manner to the nearest water pipe. The lead sheathings are all soldered to the earth plates or clips. When the wires are run under floors with the joists, they are fixed with saddles at the centre line of the joists, but where run across joists, a hole is bored on the centre line and the wires drawn through. The joint boxes are fixed to the joists by an ample plate midway between ceilings and floors.

When the wires are run on brick walls below the plaster, the brickwork is chased just enough to take the wires, a flat compounded tape is laid over the latter, and the whole is then covered with a hoop iron strip, 2ins. wide, which is fixed by nails driven into the joints in the brickwork at the edges of the iron. Thus the wires are well preserved from mechanical damage. It is claimed for this system that damp and condensation do not affect the wires and that perforation of the lead sheathing is prevented by efficient earthing. Also that the labour for fixing is low, and that when erected, it costs less than any tube system. No doubt it is an advantage to be able to use all the standard accessories on the market, such as switches, ceiling roses, etc. It would seem, however, considering the system as a whole, that whilst costing less, erected, than a tube system, it is more suitable for large buildings in course of erection than for existing small houses.

The Greenfield Flexible Wiring System.

Another system, which has not quite the same limitations, is that known as the Greenfield Flexible Wiring system, and emanating from America. Here, single, twin, or triple insulated conductors are armoured with flexible galvanised steel tubing, after the style of flexible metallic gas or steam pipes. The wires may be plain or lead covered. Various fittings are provided for joints, switches, etc. The tubing is made in two qualities, the less flexible for use in fireproof structures or for burying in concrete, and for drawing the wires through afterwards, the more flexible with threaded wires, for wiring existing buildings. It is claimed for the system that it is superior in mechanical strength to gas-barrel of equal internal diameter, and reduces the total cost of wiring on account of saving in labour and in bends and elbows.

The Simplex Flexible System.

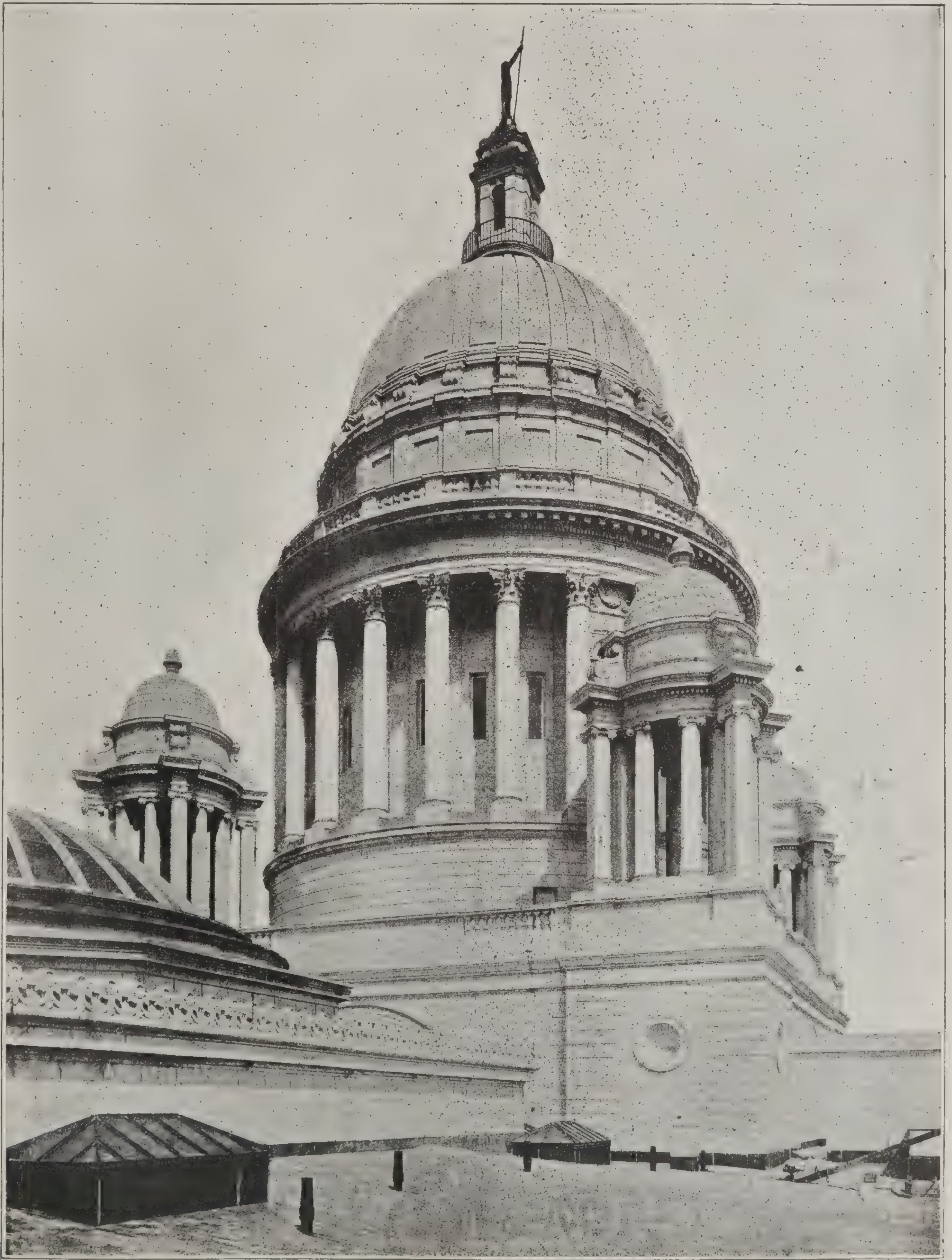
is another method for securing cheaper wiring. It consists essentially of twin small strand copper conductors, insulated with pure rubber and cotton, made up circular and armoured with small tinned iron wires. The armouring may be replaced by flame-proof or ordinary cotton covering combined with weather-proof material. The flame-proof quality may be painted after erection, and is not damaged by lime wash. These wires are for surface wiring only, and they are secured to walls and ceilings by means of spring clips on the principal of those used for billiard cues. Iron boxes are necessary for switches, ceiling roses, joints, etc., and "grip-nipples" are supplied for holding the wires where they enter the boxes. China interiors are employed for the latter for jointing purposes. It is claimed for the Simplex system that it has complete electrical continuity (the armoured type only) and flexibility, no condensation troubles, only one size of wire, readily removed, and therefore eminently suitable for temporary work, and low installation cost. Certainly the system must be cheaper in material and erection than those already described, and therefore meets the demand for inexpensive wiring in tenements, etc., where it is not necessary to combine economy with æsthetics.

The "O.S," Wiring System.

The last system to be discussed is that known as the O.S. wiring system. In this, so-called "Metacase" conductors are used, with or without Kalkos conduits (already described), according to the nature of the installation and the amount of expense that can be incurred on it. For the purpose in question, namely, an inexpensive installation, "Metacase" conductors alone are employed. These conductors consist of insulated copper wires surrounded by a tightly compressed sheathing of metal. The cheapest kind, namely, "Kuhlos" wire, is sheathed with brass with a mechanically joined seam, and is only slightly flexible, in that it cannot be bent too sharply. It is suitable for running on the surface only in dry interiors. "Stannos" wire is slightly more expensive; it is sheathed with tinned copper, with a soldered joint, and is watertight, and can be bent to quite small radii. It may be used in any position. These "Metacase" conductors do not require any joint or point boxes. All that is necessary is a metal backplate, with one of two kinds of clamps, for bringing in the wires from the side or back (as the case may be), and thereby establishing electrical continuity. These plates are fitted under wood blocks, on which may be mounted any of the ordinary accessories on the market. Continuity bus-bars are fitted in fuse boxes for the same purpose. These small fittings are very inexpensive. The conductors are fixed on the surface by means of very neat clips, which are bent over the wires by hand, and are almost invisible. It is claimed for "Metacase" conductors that, when erected, they form the cheapest, neatest and most reliable of all wiring systems. It is certain that they are extremely neat, being smaller in diameter than any other sheathed wires; they require a minimum of cutting away of joists, and when concealed wiring is employed, the plaster has only to be chased to the thickness of the wires, which does not necessitate touching the brickwork. If a private generating plant is available, or alternating current from the mains with a double-wound transformer, "Stannos" wires can be installed on the concentric system, the return current going through the sheathing. This implies using half the amount of wire, and under these conditions it is said that the wiring may be done reliably, including switches, lampholders, ordinary lamps and shades, for 10s. a point.

To Architects and Builders.

The systems described should be of considerable interest to architects and builders. To the former, as enabling them to arrange for wiring with a minimum of disturbance to the buildings, from both the structural and the artistic points of view. To the latter, as providing a less expensive means of installing the electric light, and so adding to the attractions of the smaller class of house property, which up to the present have had to be carcased for gas.



DOME OF THE RHODE ISLAND STATE HOUSE. McKIM, MEAD, AND WHITE, ARCHITECTS.

Our Plate.

House at Knaresborough.

This house has been erected on a site of about two acres, facing due south, together with stabling, coachman's cottage, conservatory, greenhouse, etc.

It is faced externally with Scotton stone, finely hammer scappled in irregular courses in thickness varying from 3ins. to 10ins., with larger quoins to the external angles, similarly dressed. The windows have stone mullions, glazed with lead lights, and fitted with Hope's iron casements.

The roof is covered with green Westmorland slates.

The open porch is of pitch pine, with seats on each side, the woodwork being treated with light coloured Solignum. The woodwork of dining-room is finished throughout with oak panelling, having waxed floor, panelled walls, fireplace ingle recess, with cupboards, shelves, etc., Well Fire Company's grate, plaster ceiling, with oak beams, etc.

The drawing-room has panelled walls and china cupboards each side of fireplace recess, also on the flank of wall near doorway. The fireplace has open dog grate in recess of Pilkington's hand-painted tiles, with Pewtal hood of ornamental design, and coloured enamels by Messrs. Spittle.

The central feature of the fireplace is a beautifully modelled plaster panel by Miss Frances Darlington of a subject taken from Omar Khayyam, the woodwork being treated throughout with white enamel.

The hall has marble floor, oak doors, with upper panels glazed. The decorative glass throughout, including a large staircase window, was designed and executed by Mr. George Walton.

The house has three reception and five bedrooms, with usual offices.

The conservatory adjoins the drawing-room with a glazed lobby, giving access to the garden or conservatory. This meets the objection somewhat of direct access to the conservatory or garden from a drawing-room, reducing to a minimum the objection to dampness and dirt.

The gardens are laid out formally, with the object of simplicity and breadth, from a design by the architect. There is a rose garden rising above the entrance court with good sized beds on each side of a central pergola terminated at one end by a flight of steps, with a sundial in the court, and at the other end with a seat. From the garden, by another flight of steps, the terrace level at front of the house is reached. Here are wide herbaceous borders, backed by a clipped beech hedge, enclosing a sunk garden and parterre centreing with a vista from the side windows of the dining-room. Beyond are a summer-house and a fair-sized rock garden, richly planted with a choice collection of Alpine and other suitable plants.

The whole of the formation and planting of the gardens was carried out by Messrs. Backhouse and Company, of York, who have supplied a very choice collection of hardy plants, many of which are seldom seen in most gardens.

There is also a bowling alley on each side with wide herbaceous border running parallel with the south front of the house, and at the right angles to the carriage drive.

The contractors were as follows :—Masons, etc., J. Simpson and Sons; Joiners, etc., J. Checkley; plumber, W. Bellerby; plasterers, Fortune and Calvesley; all of Harrogate; slater, W. Atkinson, Leeds; painter, M. Wood, Knaresborough; heating, etc., England and Robinson, Harrogate.

The whole of the works were carried out from the designs of Mr. Arthur A. Gibson, architect, 5, Prospect Crescent, Harrogate, and under his superintendence.

Eagle House, Mitcham.

The measured drawings of details from this fine old Georgian house show details of cornice, key truss to arch, archivolt, plaster cap, necking, and base. The elevation, and other details, have been already published in former issues of this journal. The work was measured by Joseph Seddon and L. F. Jones, and drawn by Joseph Seddon.

The western towers and spires of Truro Cathedral are rapidly approaching completion. The design, which has been somewhat modified in order to provide for a peal of bells in the north-western tower, is Early English, and the total height of the towers is about 200ft. The spires are alike in general design, though varied in detail, with open angle turrets and spire lights. The Cathedral School, begun a year ago, is practically ready for occupation. It has been designed to harmonise with the Cathedral and its surroundings, and when the cloisters, included in the plans, are built, the school will have a covered way into the church.

A PURELY PRACTICAL FIRE TEST.

Another striking example of the fire-resisting properties of concrete is at hand to substantiate the remarkable record of this material as shown by the conflagrations at Baltimore and San Francisco and recent fires in New York and Dayton. On this occasion the structure, which was subjected to a severe and practical test, an actual fire, was a reinforced concrete building, comprising part of the plant of F. W. Tunnell and Co., manufacturers of glue, at Wheatsheaf Lane and Gaul Street, Frankford, Philadelphia. Their building was tested from within and without by a fire so hot that wire-glass window panes were melted in their metal frames. In view of the attitude of some insurance companies on the subject of concrete building risks, it is interesting, if not amusing, to state, that the insurance experts called in to adjust claims had luncheon served to them in this concrete building, upon which no insurance was carried, while they estimated the loss sustained by the destruction of the surrounding buildings. What may be their views at present has not been ascertained.

The building was erected in 1906 by Ballinger and Perrot, architects and engineers, Philadelphia. It is a 3-storey structure 104ft. by 43ft., and is of reinforced concrete throughout. The second floor is supported on reinforced concrete columns spaced about 15ft., and the third floor and roof have a clear span of 39ft. supported on cross beams 12ins. by 26ins., the latter reinforced by eight 1¼-in. round rods. The slabs are 4½ins. thick, reinforced with ⅜-in. round rods on 6in. centres. The beams are 7ins. apart. The floors have a 2-in. cinder concrete base over the slabs, with a 1-in. cement top coat. The walls are reinforced concrete, 12ins. thick. The wall construction includes pilasters. The windows were of the metal frame and wire-glass pattern. Edison-Portland cement was used.

About this building, and comprising a part of the plant, were several frame buildings. It was in one of the latter buildings that the fire took place, due, it is said, to spontaneous combustion. Thus, when the fire was in full blast, the concrete structure at certain points was practically enveloped in flames. The contents of the factory made an intensely hot fire. As stated above, the heat was so intense that the wire-glass in the concrete building melted. That the wire-glass melted is attributed to the fact that the windows

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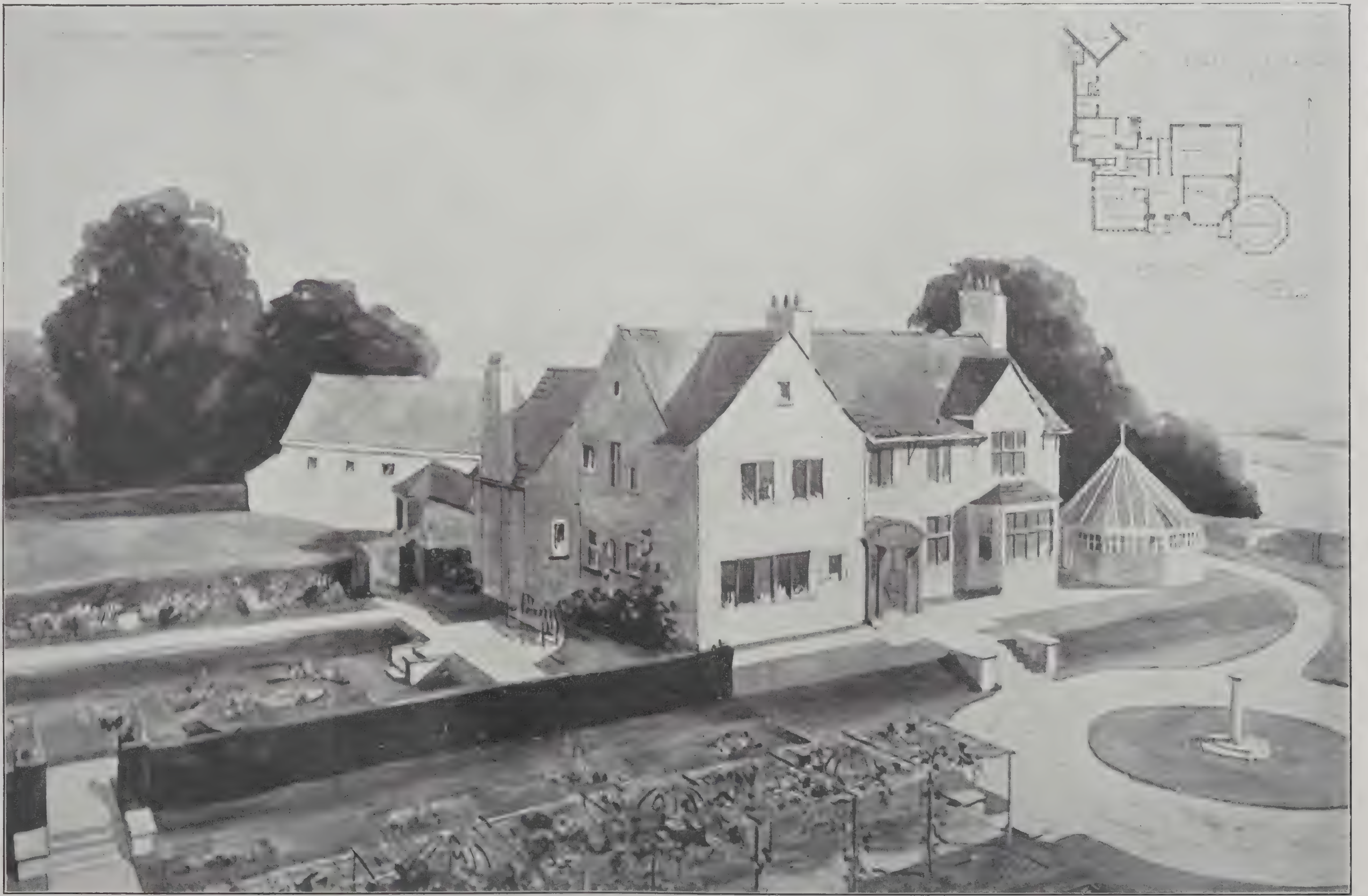
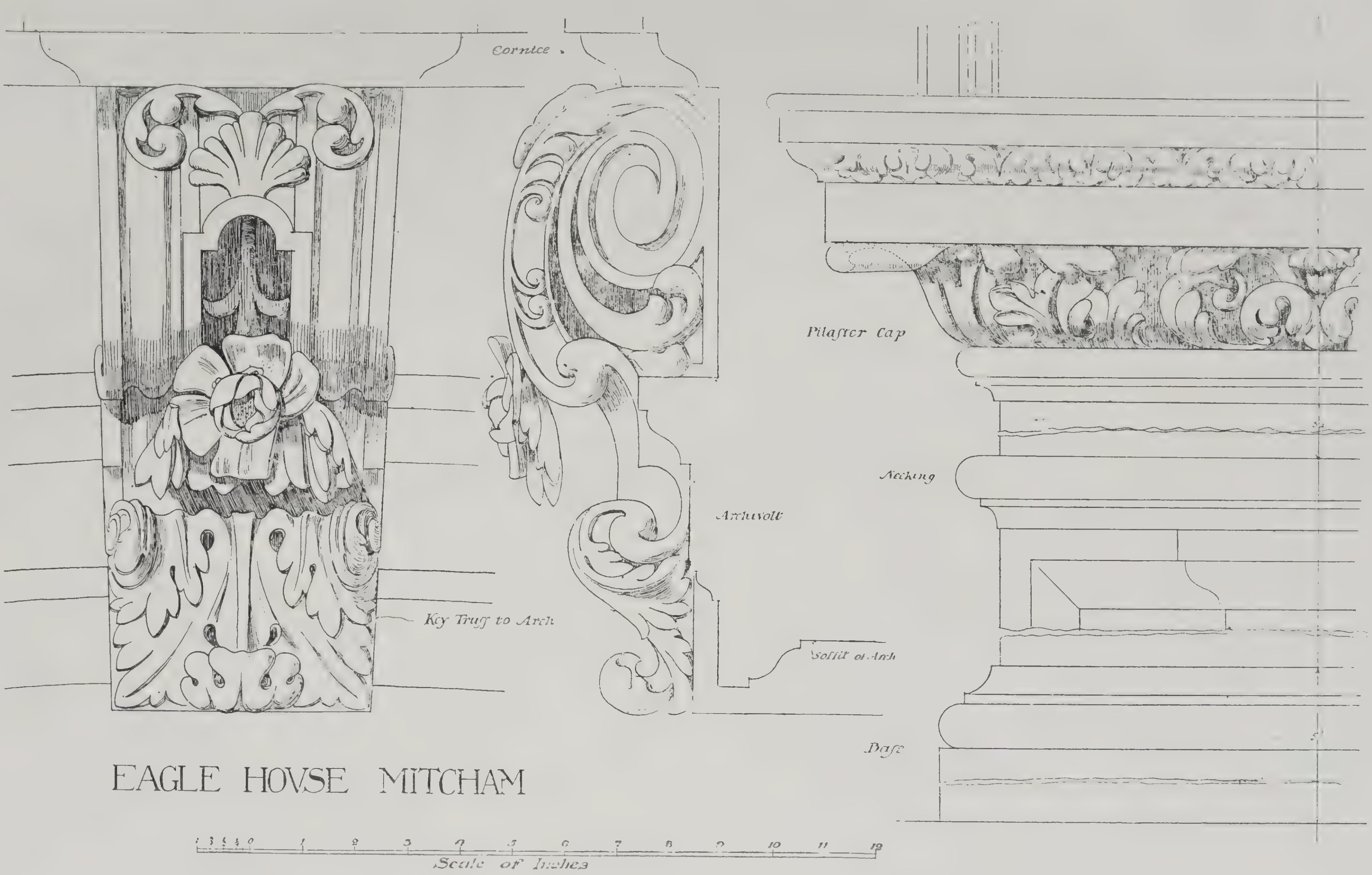


HOUSE AT KNARESBOROUGH, YORKS. ARTHUR A. GIBSON, ARCHITECT.



EAGLE HOVSE MITCHAM

MEASURED BY JOSEPH SEDDON AND L. F. JONES, AND DRAWN BY JOSEPH SEDDON.

were open, thus permitting the flames to gain access to the interior, and to surround the glass. Judging from previous tests of wire-glass it would probably have withstood the heat with the flames confined to one side. Wooden drying racks in the concrete building took fire, and soon there was a mass of flames within and without. The buildings immediately adjoining the concrete structure were, with one exception, totally destroyed. Even a brick boiler house adjoining the concrete building was so badly damaged that it was necessary to take down the walls. The destruction of the brick structure affords an interesting comparison with the behaviour of the concrete building. The building that escaped destruction owes its survival to the fact that it was protected by the concrete building, the latter proving to be an effectual barrier to the fire.

When the fire finally subsided, it was found that the concrete building was practically uninjured. That it was thoroughly tested is indicated by the fact that a wire lath and plaster ceiling suspended from the roof beams was practically destroyed. The ceiling was not intended as a protective feature, but merely to prevent the beams from deflecting or interfering with air currents forced through the room during process of manufacture.

One end of the building was open, and through this the flames concentrated upon a concrete column which merely spalled. Shrinkage cracks here and there had widened under the stress. The bottom of a concrete cantilever had also spalled, but the damage can all be repaired at slight cost by patching. The vital parts of the structure remained intact.

The owners are so pleased with the behaviour of the building, that they promptly authorised Ballinger and Perrot to prepare plans for additional reinforced concrete buildings to replace the structure destroyed.

No practical purpose would be served by going further into the details of this fire. It only remains to be said that the result corresponds with practical tests of other concrete buildings subjected to the same conditions. The unusual circumstance in this case was the fact that the structure was attacked from within and without, but, as stated, the slight damage can be repaired at trifling cost. So far as this building is concerned, the business of the firm can proceed without interruption, and with the new buildings of reinforced concrete there will be established a plant upon which the item of insurance may be eliminated, to say nothing of the satisfaction of knowing that fire cannot harm it.

MADISON SQUARE GARDENS, NEW YORK. McKIM, MEAD, AND WHITE, ARCHITECTS.

OVERBUILT MANCHESTER.

Mr. M. K. North, a local Government Board inspector, has held an inquiry at the Manchester Town Hall into the application of the Corporation to be excused from the statutory obligation to build houses to take the place of those that have to be demolished in order that the Education Committee may build three new schools. Sir W. H. Talbot, town clerk, presented the case for the Corporation. Mr. Councillor Johnston opposed the application on the ground that, in his judgment, it will be better financially, as well as from a health point of view, for the Corporation to go on with the housing scheme at Cheetham.

This housing plan was agreed upon four or five years ago, and land was bought which is costing the city over £500 a year. Plans of houses to be built and estimates of cost have been prepared, but when the Council was asked for a final decision it decided that there are so many empty houses in the city that it would be a waste of money to go on with the housing scheme. Accordingly a deputation waited upon Mr. John Burns, President of the Local Government Board, and asked him to relieve the city of the necessity of providing new houses in lieu of the few that have to be removed to make way for new schools. The Education Committee wish to build three new schools. They have secured the sites. On these sites there are 36 labourers' dwellings. There are also several small shops, but the Working Classes Act, 1903, takes no cognisance of shops; it concerns itself with labourers' houses only. It has been found that in the three localities there are 732 empty houses within half a mile of the houses which it is proposed to demolish, and that these untenanted dwellings may be had at rents equal to those paid for the houses now occupied. In these circumstances the inspector was asked to advise the Local Government Board that there is no necessity to build more houses.

The Lord Mayor said he had personally visited the three localities, and was of opinion that a housing scheme was not needed because of the large number of empty houses at small rents.

Sir Thomas Shann expressed a similar opinion. Three schools are needed to accommodate the 2,000 children now attending the seven existing schools. The sites for the new schools have been bought and paid for with £19,830. "The children concerned," he added, "are among the poorest we have, and we think they ought to be put in better schools as quickly as possible."

Mr. C. H. Wyatt said he knew the district affected, and was convinced there is ample house accommodation within an easy distance of the 36 houses that are to be pulled down.

Mr. Alderman Copeland gave supporting evidence, adding that if the application is granted it will mean a saving of £16,000 or so. He also read a letter expressing approval of the application by the Retail Traders' Association.

This concluded the case for the Corporation.

Several persons who occupy shops that are to be demolished pleaded for compensation for disturbance. They said they had spent many years in these shops, and if they were turned out they would be ruined; they did not know where to go, and in any case they would have to build up new connections, which in these days of keen competition was a hard thing to do.

The inspector expressed sympathy with these people, but feared they were outside the scope of this inquiry.

Mr. Councillor Johnston appealed to the Inspector to advise that the housing scheme be proceeded with. In his judgment a serious loss will be sustained if it is not gone on with. Land on the Temple Estate has been bought. True, it can be sold, he said, but his experience has taught him that buying and selling land by municipal authorities are two different things.

Mr. Caminada said that many property owners are in distress and have petitioned the overseers for a remission of their obligations, "as it was impossible for us to meet their demands."

The inspector said he had spent nearly half a day in making himself acquainted with the districts in question. He also pointed out that the several tenants of the threatened houses and shops had had four or five years' notice that the houses were needed for a public work, so that it could not be said, he thought, that the Education Committee had hurried the business.

An international housing congress will be held in Vienna, May 27th to 30th, 1910. It is expected that about 300 delegates will attend.

* * *

The Lincolnshire C.C. have accepted the tender of Messrs. Andrew Handyside and Co., of Derby, for the erection of a new bridge over the Welland at Fosdyke, between Spalding and Boston, at a cost of £16,834. The old wooden bridge, which will now be demolished, was built 100 years ago, at a cost of £22,000, and was used for the passage of Scotch cattle from the North to the Eastern Counties and London.

* * *

The Vice-Chancellor of Oxford University has received an intimation from Mr. John B. Carrington, Hampstead, of his intention to contribute to the University the sum of £160 with a view to the completion of the carving in the coffers of the gallery niches in the new schools, according to a design and estimate furnished by the architect, Mr. T. Graham Jackson, R.A. Mr. Carrington has already contributed sums towards the carrying out of the decorative carving in the schools, amounting to about £570.

Fire Prevention Notes.

Steam Motor Fire Engines. A novelty of some importance in connection with motor fire engines, has been invented by Messrs. Merryweather and Sons, Ltd., whereby, it is claimed, a steam motor fire engine can proceed to a fire with the same celerity as a petrol machine, and with more certainty. The apparatus consists of a connection whereby steam can be kept in the engine boiler at 100lbs. pressure, this being suitable for pumping and for travelling. With the introduction of this new device, steam cars of the Merryweather and other types, especially those used for domestic purposes, the doctor's car, the ambulance, etc., can start instantly. The apparatus has been inspected by the London Fire Brigade and many of the Lancashire and Yorkshire brigades. It promises to be a desirable improvement in steam motor travelling, as the apparatus is also arranged for heating the engine-house and hose-drying towers.

Fire Prevention in Paris. At a three-days' conference of the French Fire Service Association held in Caen at the end of last month, considerable attention was paid to what may be regarded as "the previous question," that of fire prevention. The case of fire-service officials is comparable to that of enthusiastic doctors. Each exists by curing the evil that each is highly desirous of preventing, which would be a rather paradoxical position if cynically viewed, and if everybody were not most poignantly aware that, in spite of the utmost that can be done, neither fire nor disease will ever be wholly preventable. Much, however, remains to be done before we can even hope to reach the irreducible minimum of risk. Our French friends are apparently determined to go as far as possible in this direction, as they have decided to form a National Fire Prevention Council. A special commission, comprising about thirty members, was to be appointed with the object of preparing a scheme of organisation. M. Lépine, Prefect of the Paris Police, has consented to act as chairman, and several representatives of Government departments are expected to join. It is believed that the work of the council will be largely educative —that is to say, that an earnest attempt will be made to enlighten the general public with respect to the general, and especially the minor, means of fire prevention. This, it seems to us, is to begin at the right side. If, beginning with the school-children, the public can be induced to take an interest in the subject, a very substantial reform will naturally ensue. It is ignorance and apathy that lead to the perpetuation of risks and calamities that are quite preventable, and ought to be prevented. Those who devise or supply the ways and means of fire prevention need more than anything the support of an intelligent and a sympathetic public opinion. It is only in this way that, in process of time, the present apathy will be looked upon as something almost incredible and well-nigh criminal.

Fire at York Minster. It was mentioned in this journal a fortnight ago that a slight fire at York Minster had for a short time endangered the existence of that noble and beautiful fabric, which has on several occasions in the course of its long history suffered from fire, and was once set alight by a lunatic incendiary. On the occasion of the most recent outbreak, the first hydrants that are kept in the Minster were brought into play, and hose was taken on to the roof, as soon as it was discovered that some of the beams had caught fire, and the danger was soon averted. Happily, we are spared the pain of showing a damaged York Minster, for the fire has left no visible traces; but we cannot forego the pleasure of showing a view of a building that one never tires of seeing. The antiquity of the Minster is very respectable. The Minster that was begun by Edwin about 628, finished by Oswald about 635, and repaired by Wilfrid, was probably burnt down in 741, if this indeed is the church in the city of York that Richard Hovenden refers to in his chronicle as having suffered that fate. Albert apparently rebuilt the Minster in 767-80, and it was at least partly, and perhaps wholly, burnt in 1069. Thomas built the nave, the transepts, and perhaps the choir about 1080, and Roger rebuilt the choir and crypt in 1154-1181. The towers are all of the fifteenth century. The choir was injured by fire in 1829, and the nave in 1840. The Minster's experience of fire is, therefore, rather extensive—but hardly more so than that of most buildings of its age—and decidedly peculiar.

Printing Office Fire Precautions. Printers are, with excellent reasons, extremely keen on fire prevention. Last month we reproduced the substance of an excellent paper on fire prevention, written by a well-known printer, Mr. Ralph Hazell. We now note that another eminent firm of printers, that of Messrs. Bemrose and Sons, Ltd., have got to the length of holding a fire-brigade tournament and sports, the first of their kind in Derby. The object was to bring together all the private amateur fire brigades in the town, of which there are eight. Details of the tournament are not to hand, but as it is mentioned that Superintendent Thomas Breaks, of Nottingham, and Superintendent Melhuish, of Derby, were present as judges of the "open fire brigades event," it is to be supposed that some of the competitions were of a sufficiently serious and practical character. Some amateur brigades, indeed, develop very considerable skill and smartness, when, as is probably the case at Messrs. Bemrose's establishment, the men are allowed frequent opportunities for practice. The brigade at a large London printing office—Messrs. Cassell's, Ludgate Hill—used to drill regularly under professional supervision, and was often called out on test alarms. Nor was their exercise confined to mere display. Upon more than one occasion they had had to fight actual outbreaks, and they have always conquered. At this establishment, too, and doubtless at many others, the employees are—or were—periodically exercised in the use of fire-escape appliances. Messrs. Cassell's office, when built some five-and-thirty years ago from the designs of the late Mr. Chambers, was considered to be a marvel of fireproof construction, and in that respect was no doubt re-

Photo: Topical.

STUDENT STRIKE-BREAKERS.

The work of rebuilding the new home for the Paris Students Association in the Rue de la Bucherie came to a standstill owing to a strike of ironworkers. The students took up the job. When this photogra was taken they had hardly discarded the character of students. (*See page* 267.)

presentative of the best that was possible in those remote days; the main staircases being of stone or of iron, the window-frames of iron, while iron doors divide the various departments It must have been one of the first buildings in London to adopt a complete sprinkler installation; and at every turn there are hand grenades, extincteurs, and rows of red pails kept constantly replenished with water for fire service. The fire dangers to such a building come mostly from without, and we believe that of the several outbreaks that have been speedily suppressed at Cassell's, nearly all have been communicated from neighbouring buildings. Upon one occasion the amateur brigade at Cassell's remained on the roof all night quenching the sparks and embers that fell from an adjacent building that was completely destroyed. Amateur brigades, therefore, are not to be despised, but deserve the stimulus and encouragement that Messrs. Bemrose seem disposed to mete out to them.

Fire Panics. Cinematograph exhibitions have been, at home and abroad, provocative of so many fires and panics—the latter usually more serious in their consequences than the former—that it is not surprising to find the Sheffield licensing justices imposing such stringent regulations as to suggest that these magnates are themselves suffering from a sort of panic. They have decreed almost prohibitive conditions. All such places of entertainment are to be connected by telephone with the fire station, and the licensee is to pay the cost of a city fireman's being in attendance during every performance. In every case the chief constable is to be satisfied that all reasonable precautions have been taken against accident and danger to the public. The cinematograph is to stand in a box constructed entirely of metal and asbestos, fitted with automatic doors and shutters; and the machine is to be cleaned and examined every day. That is all very well; but the city fireman and the chief constable must be indeed of the more or less mythical race of supermen if they are able to prevent panic. Their very presence is about as encouraging as the sight of the ambulance corps on the field of battle. The way to inspire confidence and prevent panic is to familiarise the public mind with the knowledge that the building is thoroughly fireproof and that the exits are ample. But this assurance cannot precede the fact. Old buildings should be so modified, and new ones so planned and constructed, as to inspire the public with full confidence in the efficiency of the provisions for safety against fire or blocked exits. The means are available; and it only remains for the authorities to insist in their application; instead of which they call in the city fireman and the chief constable, both of whom might be more worthily employed.

STUDENT STRIKE BREAKERS.

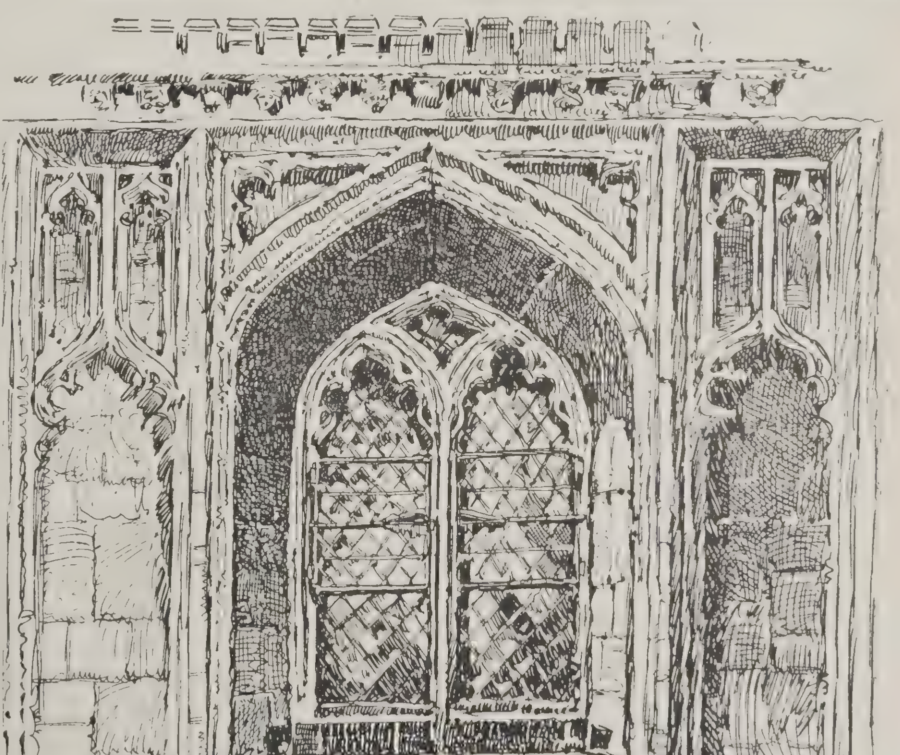
In consequence of a strike of Paris ironworkers, the work of erecting the new building for the Paris Students' Asssociation (Rue de la Bucherie) came to a standstill. The students, fearing that the completion of the building might be delayed so as to prevent its being ready for occupation at the recommencement of their term, determined to take the matter into their own hands. Accordingly, a group of them, under the leadership of their president, M. Jullien, set to work and put up the iron supports at the summit of the building. That having been accomplished, the work in the rest of the building is going ahead without interruption. The illustration not only serves as a souvenir of this curious incident, but has an inherent interest as a characteristic example of French methods.

Mr. Philip P. New, a retired architect, of Clement Royds Street, Rochdale, who has died suddenly from heart failure, was 61 years of age.

THE RENOVATION OF LONDON'S GUILDHALL.

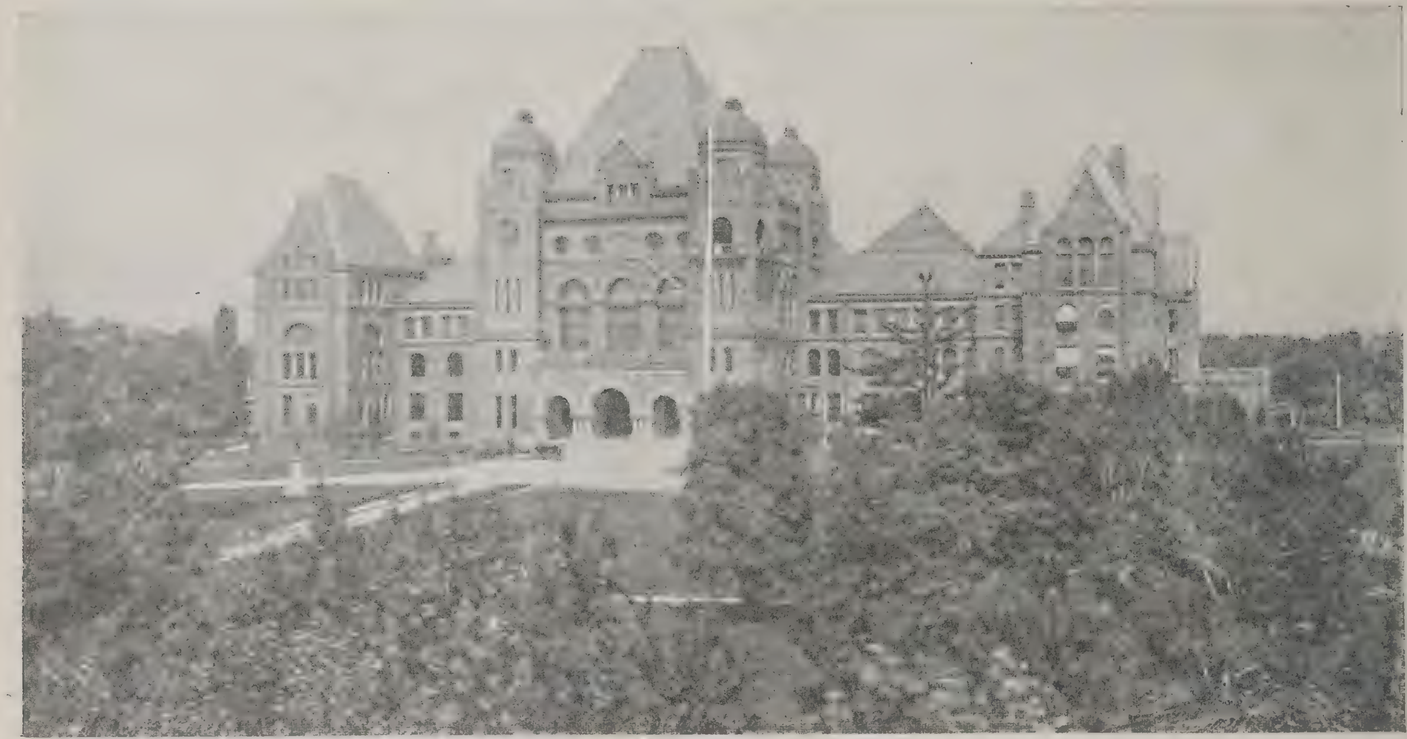
Discovery of Fifteenth Century Window.

The work of removing by means of high-pressure steam the dust and grime of centuries from the columns, panels, and walls of the Guildhall has been completed, the result being that the interior of the Great Hall has undergone quite a transformation. The work has been an unqualified success, the appearance of the building having been vastly improved by the removal of a great deal of dirt and the wash work, which not only to a large extent detracted from the dignity of the hall, but was the means of concealing much of its architectural beauty. The bare stone in its original colour has been disclosed to view, and in some places evidence of the ravages of the Great Fire of London, which left only the bare walls standing, can be seen. The removal of the silicate paint which has so long concealed from view the original masonry promises to have results which were in no way anticipated by the City Lands Committee when, acting on a suggestion by the City Surveyor, Mr. Sydney Perks, F.S.A., they entered upon the work. Quite by accident Mr. Perks discovered, hidden behind a mass of plaster, one of the original windows with which the home of the City Fathers was equipped in the days of the fifteenth century. While superintending the removal of the plaster covering in one of the recesses, he discovered that the masonry behind, instead of running at right angles, travelled in a diagonal direction, and this caused him to continue the investigation, with the result that in a short while a casement was brought to light. The committee, whose chairman is Mr. W. Hayward Pitman, C.C., were, says the "City Press," immediately made acquainted with the discovery, and Mr. Perks received instructions to go forward with the work, and open up the complete window. This has now been done, and the window can be seen in all its original charm of outline, the tracery of the arches into which it was built being of a beauty which will excite the admiration of all qualified by knowledge to form an adequate opinion of the importance of the find. First, the window was covered in with wood, the recess being entirely blocked up with brickwork and plaster. The casement is believed to be of fifteenth century construction, and the hasps of a shutter which covered it in are still in position on each side of the window. It is 9ft. 6in. in height, and 6ft. 6in. in width. The glazing is not thought to be of any great age, and, in fact, the Surveyor, who has taken the advice of authorities on glass, entertains the view that it is only of nineteenth century date. The "find" induced the Surveyor to continue his labours on the other side of the Great Hall, where there was a similar panelling of plaster; and it was not long before the masons discovered the remains of another window contemporary with that previously revealed. Unfortunately, the architecural features of the ancient casement are missing with the exception of the arches springing from the top, the mullion having been destroyed. It is a matter of regret that the hand of Time should have thus dismantled so interesting a relic of the fifteenth century. The further discovery is, however, of considerable importance in an archæological sense, and further investigations will probably be fruitful of additional discoveries in connection with the really ancient fabric of the Guildhall. In the



A NEWLY DISCOVERED FIFTEENTH CENTURY WINDOW.

This window was recently discovered by Mr. Sydney Perks, F.S.A., the City Surveyor, while superintending the renovation of the Guildhall, London. It was hidden behind a mass of plaster.



THE PARLIAMENT BUILDINGS IN TORONTO.

The west wing of this building, which has been burnt, is on the left side of this picture. An enlarged view, taken from the rear of the building, is shown on the opposite page. The illustration here shown is reproduced from the magazine called "Canada."

meantime the Surveyor may be congratulated on his interesting find, which adds immensely to the value of the work originally undertaken. The accompanying illustration of the window is reproduced from the "City Press" by the courteous permission of the proprietors, Messrs. W. H. and L. Collingridge.

THE GREAT FIRE AT TORONTO.

The Ontario Parliament Buildings at Toronto, of which the west wing was destroyed by fire at the beginning of the present month, are situated at the south end of Queen's Park, Toronto. They consisted of a massive block of buildings erected during the years 1888 to 1892 from the designs of Mr. Waite, of Buffalo. The block cost approximately £260,000, and the damage is estimated at a million dollars. The west wing is that shown on the left of the illustration, which is reproduced by courteous permission of the editor of "Canada," a magazine devoted to the interests of the Dominion. A further illustration shows the extent of the damage. The second floor of the extreme west wing contained the library, consisting of 300,000 volumes, and the Law Offices, where the judges have been engaged in making a most thorough revision of the Statutes of Ontario. In the west wing, too, were the quarters of the Clerk of the House, the rooms where the records of committees were kept, and the committee rooms. At the back were the Speaker's apartments, the Ministers' dining-room and smoking-room. Other offices in the block were the Labour Bureau, the Registrar-General's office, and that of the Inspector of Insurance. In the block were housed the housekeeper and his family. Until recently, the building was not insured, but about May this year negotiations were completed for an insurance of $1,000,000 fortunately. At the back of the central building there was building construction going on.

Mr. Thomas Barnsley, J.P., of Edgbaston, Birmingham, retired builder, who died on June 19th, aged 78, left £79,972, including £10 to each female servant of twelve months' service.

Correspondence.

[*The Editor declines responsibility for the statements made or opinions expressed by correspondents.*]

The Budget and the Builder.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I have read with interest your leader, "The Last Straw for Brickmakers," in your number of the 22nd inst. I am afraid it will be a sorry thing for the building trade, but the Budget proposals effecting the trade unfortunately do not stop here, as in addition to the brick clay, which of course includes terra cotta and paving and roofing tiles, and the coal which burns them, it is proposed to tax lime (so largely used for mortar and plasterer's stuff, and also for cement), slates, stone, lead, copper, iron, and, of course, zinc, incidentally, unless imported; timber, glass, and paint are all that are allowed to go free, and in view of these things we are asked to believe that these proposals will *benefit* the trade.

As regards the proposals of the taxation of undeveloped land, I have no doubt that the effect will be for all those owners of undeveloped land who are men of substance, that each annual tax which may be paid will be added to the capital value of the land, and as a consequence make undeveloped land (which we may regard as a builder's raw material) still dearer.

I am convinced that if all who are associated with the building trade fully realised what these proposals mean, there could not possibly be two views upon the question as to whether the Budget is good or otherwise for the building trades.

S. COOPER STEVENS, architect.

Birmingham.

[It will be noted that the proposal to tax brick earth has been abandoned.—ED.]

NEWBURN NEW COUNCIL OFFICES.

A special meeting of Newburn Urban District Council was held at Newburn to receive the report of Mr. R. J. Leeson, the assessor, on the sixteen competitive plans sent in for the proposed new council offices. In his report Mr. Leeson stated that he had no hesitation in advising that first place be awarded to the set of plans No. 15. The second premium he would award to the author of No. 3. He explained that No. 15 complied with all the council's requirements in an economical and satisfactory manner. The author suggested the squared frontage.—which Mr. Leeson thought wise—and all his public offices were entered from a well-lit hall. On the first floor the council chamber and committee-room were thoughtfully arranged. The author also showed how a large council chamber could be obtained if required. The caretaker's house had been placed on the lower ground floor, taking advantage of the slope of the ground. The elevations were excellent on all sides, being well proportioned, and would in execution give a dignified character suitable to the purpose of the building, and this in an economical manner. The set of plans No. 3, Mr. Leeson considered, ran the design placed first very closely. The council examined all the plans, and unanimously decided to adopt the assessor's recommendation, accepting plans No. 15, and appointing the author of these—who proved to be Mr. Edward Cratney, Wallsend—as the architect to carry out the work, and awarding the premium of £10 to the authors of No. 3, Messrs. Marshall and Tweedy, Newcastle.

Proposed New Works.

COVENTRY.—The proposed new church of St. Margaret's is estimated to cost about £6,919. The site, which is at the junction of Walsgrave Road and Argyll Street, has cost £556.

CROYDON.—Application has been made to the Local Government Board by the Town Council for sanction to borrow £10,800, a sum which is to be used in connection with additions to the Borough Hospital for infectious diseases.

HAMBLEDON, SURREY.—At a meeting of the Hambledon Rural District Council, a letter was read from Messrs. Charles Russell and Co., asking for the Council's approval of proposal for constructing bridges connecting up different portions of Witley Court. It is proposed to construct a bridge over the existing road close to Furze Field

Wood. It is suggested that the present road level shall be eased down at this point by about two feet, and that a full headway of 12ft. should be kept beneath the bridge. The bridge is to be formed of steel girders, joists, cement concrete, masked entirely in oaked boarding and with high oak parapets. It is proposed to form the abutments of the bridge in cement concrete, faced, as far as may be necessary, with Bargate or other hammer dressed rubble stone. The existing boundary wall at the north side would be maintained and underpinned as necessary, the opposite bank not to be interfered with. It is also proposed to form a bridge near Brook. It will be constructed of stone parapets, arches, piers, and facing walls, the actual bridge being formed in reinforced concrete, the roadway to be over a bridge of its full width and with a rise with the length of the bridge of 20ins. A temporary bridge is to be constructed to carry traffic during the construction of the new bridge. The intention is to form a new private road running beneath the road leading to Brook and Hindhead Common. The matter was referred to a committee.

MATLOCK.—A scheme for the development of Matlock as a pleasure resort is vaguely estimated as being likely to cost anything between £10,000 and £20,000.

OBAN.—A portion of the proposed new Episcopal Church is shortly to be erected. When completed the church will consist of a central nave, choir, chancel, and sanctuary, having aisles at each side, terminating in fine transepts, in height and width equal to the nave. Mr. James Chalmers is the architect.

RADCLIFFE, MANCHESTER. — Towards the £1,500, the estimated cost of the proposed sanatorium for consumptives in Radcliffe and district, the promoters of the scheme have received promised contributions amounting to £1,000, and they are hopeful that very shortly they will be in a position to determine a definite scheme.

ROTHESAY.—The Town Council now has under consideration the question of providing a pavilion, which it is proposed to erect for the accommodation of 1,000 persons at a cost of £3,500.

SWANSEA.—A Local Government Board inspector has held an inquiry into the Council's application for a loan of £2,800, for the purpose of a new scheme for the provision of houses for the working classes.

WEST BROMWICH.—It has been proposed to erect a new Council school here for 1,280 children, at a cost of not more than £12 10s. per head. A local architect and a local builder are, it is believed, to be selected for the work.

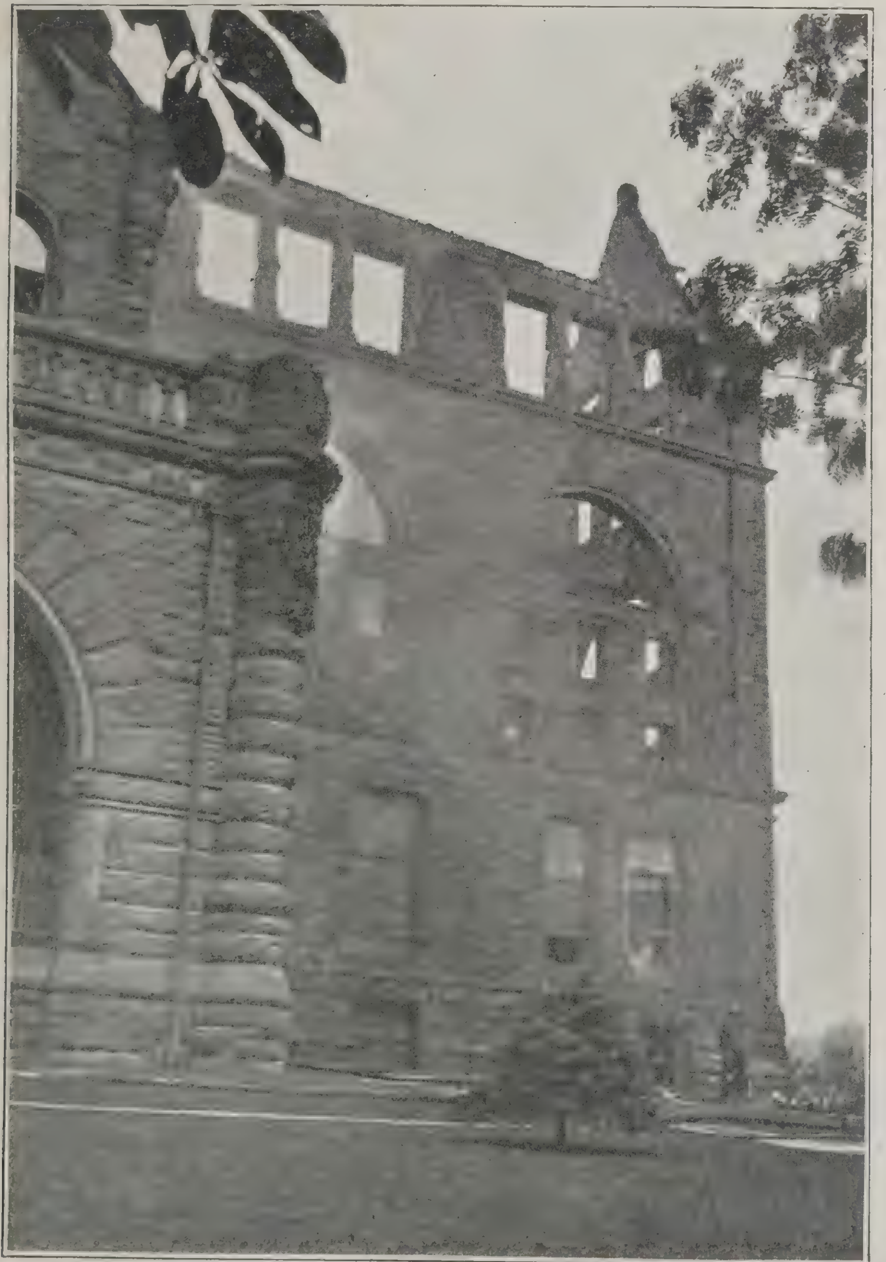


Photo: Topical.

WEST WING OF THE PARLIAMENT BUILDINGS, TORONTO.

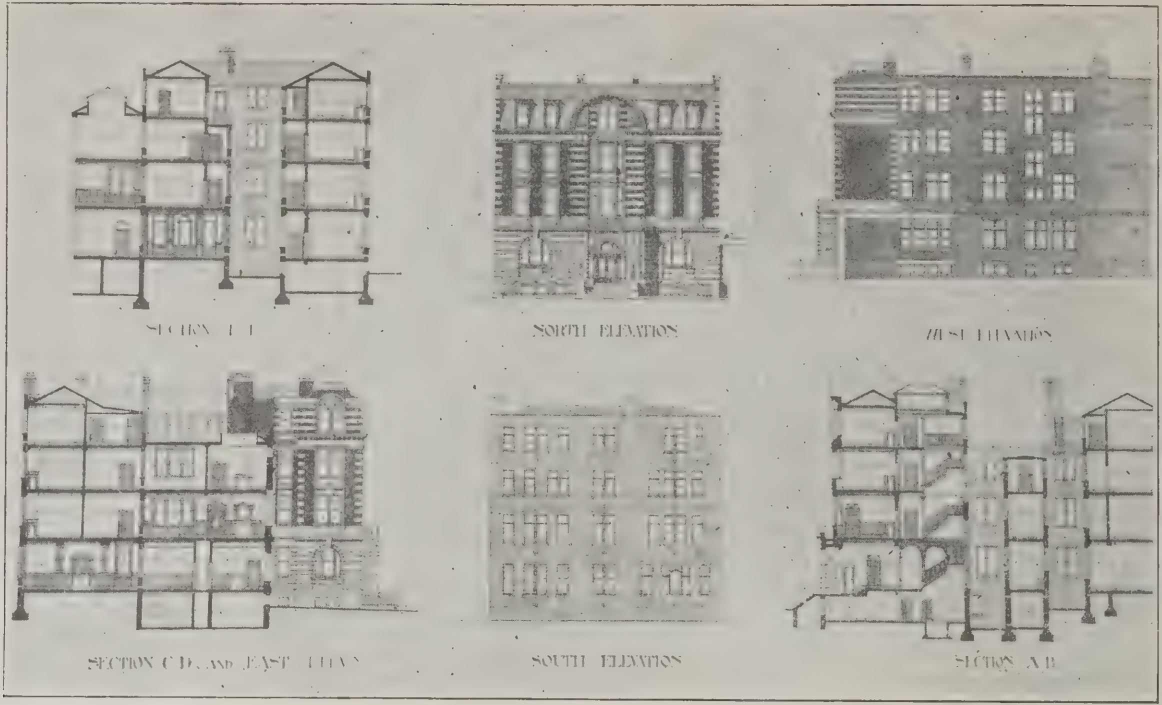
An account of the fire, and a view of the complete building, are given on page 249.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Nov. 1.	TECHNICAL SCHOOL. The Corporation of the Borough of Kendal invite architects residing and practising in Westmorland to submit a competitive design, together with a written description and estimate for the erection of a technical school. Premiums of £15, £10, and £5, are offered: the designs to become the property of the Corporation. Particulars may be obtained free from the Borough Surveyor.
Nov. 1.	PRESTON GRAMMAR SCHOOL FOR BOYS. Preston Town Council invite competitive designs and plans from architects practising as principals, for a new grammar school for boys, to be erected in Moor Park Avenue, Preston, and estimates for the same. Premiums of £50, £30. and £20 are offered. The Corporation have appointed a professional assessor. Application to be made to Mr. Alfred Howarth, Town Clerk, Town Hall, Preston, and designs and plans must be sent in by 10 a.m. on Nov. 1.
Nov. 30.	HERNE BAY PAVILION ON PIER. Herne Bay Urban District Council invite competitive drawings for a pavilion to be erected on the proposed extension of the pier at a total cost not exceeding £4,000, exclusive of architect's commission. Premiums of twenty-five guineas and ten guineas respectively will be awarded for such two designs as shall be judged of sufficient merit by the Council, and placed by them as first and second; the premium of twenty-five guineas to be afterwards merged into the usual commission payable to the architect, provided the work is carried out by such competitor. Plan of the site and copy of the conditions may be obtained on application to the undersigned on and after the 24th instant on payment of one guinea, which will be returned on receipt of a bona-fide design. Drawings to be deposited at the Clerk's Office, Town Hall, Herne Bay, not later than noon on the 30th November next.—Joseph Jubb, Clerk to the Council, Town Hall, Herne Bay.
Dec. 18.	TRAINING COLLEGE FOR TEACHERS, Kirkstall Grange, Far Headingly. Leeds. Architects practising in Leeds are invited to submit competitive designs for the above College. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed to assist and advise the committee in deciding the competition. The competition will be for the educational block and for the general laying out of the estate including the position of the various hostels, swimming bath, laundry, sanatorium, principal's house, vice-principal's house, lodges, gardens, playing-fields, roads, etc. On the payment of a deposit of £2 2s. (which will be returned on receipt of a bona-fide design) each competing architect may obtain a copy of the conditions of competition and instructions, a plan of each floor of the educational blocks and of the hostel blocks, also an estate plan, showing a suggestion for grouping the various buildings. Designs to be delivered to the undersigned not later than 12 o'clock noon, on Saturday, 18th December, 1909. James Graham, Secretary for Education, Education Department, Leeds.
Jan. 31, 1910.	NATIONAL MUSEUM OF WALES. The Council desires to receive competitive designs for the erection of a new National Museum at Cardiff. Three premiums are offered of £200, £150, and £100, for second, third, and fourth. The Council have appointed Sir Aston Webb, R.A., Mr. John J. Burnet A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A., as Assessors. Particulars and plans of the site will be supplied to competitors on payment of a fee of £2 2s., which will be returned on receipt of a design in accordance with the conditions, or if all papers are returned within 14 days. Inquiries to be addressed to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.



BERKS COUNTY COUNCIL OFFICES. SECOND PREMIATED DESIGN. E. J. SHREWSBURY, ARCHITECT.

BERKS COUNTY COUNCIL OFFICES.

This week we show the second premiated design in this competition, the first having been illustrated last week.

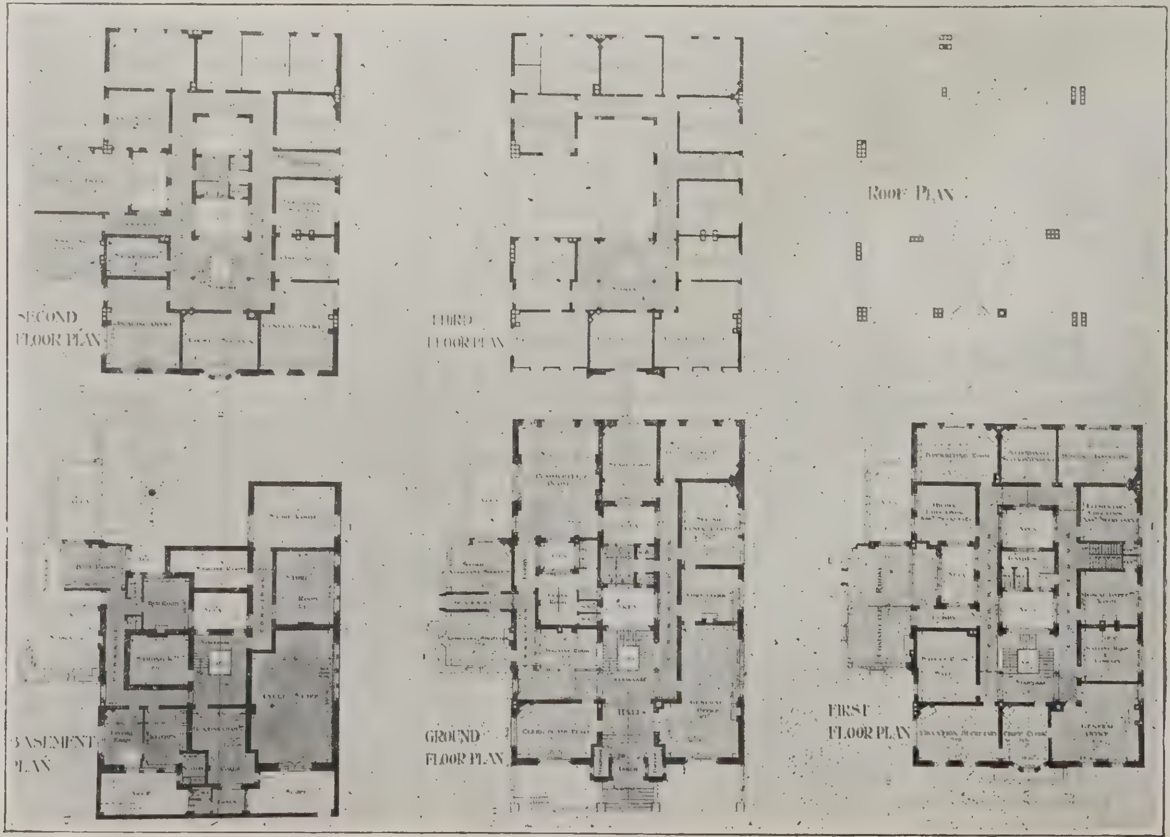
In the second premiated design—that of Mr. E. J. Shrewsbury, of Maidenhead, the various departments are arranged on separate floors, and in distinct blocks, and direct communication is provided for between the heads of each department and their assistants.

All the general offices and waiting-rooms are close to the main staircase and lift, which are centrally placed, immediately opposite the entrance. A secondary staircase is provided from the first to the third floor. Access from the Assize Court to the new buildings is arranged on the ground floor, and also on the first floor.

The committee-rooms are so placed as to be in direct communication with the court. Both rooms have a considerably larger area than is required by the conditions, and the Education Committee room is arranged to be divided into two rooms, each having its own fireplace and entrance door. The provision of central areas allows for efficient lighting and ventilation of the whole of the corridors and lavatories, and there is direct and simple connection with the main drainage

Separate cloak-room and lavatory accommodation is provided for (1) members of committees, (2) officials and staffs of the various departments, and (3) ladies. The caretaker's apartments in the basement have a separate entrance, are self-containing, and can be cut off completely from the rest of the building. Storage for 40 bicycles is also obtained in the basement, with a separate entrance, and so arranged that all the machines can be separately placed.

For the elevations, Lawrence's Bracknell facing bricks would be used, with Portland stone dressings. The roof to be covered with Silberthwaite Westmorland bright sea-green slates. The floors to be in reinforced concrete, with metal lath ceilings suspended under. The buildings throughout to be warmed by radiators, fireplaces also being provided in all principal rooms and ventilating flues carried up in chimney stacks.



BERKS COUNTY COUNCIL OFFICES. SECOND PREMIATED DESIGN. E. J. SHREWSBURY, ARCHITECT.

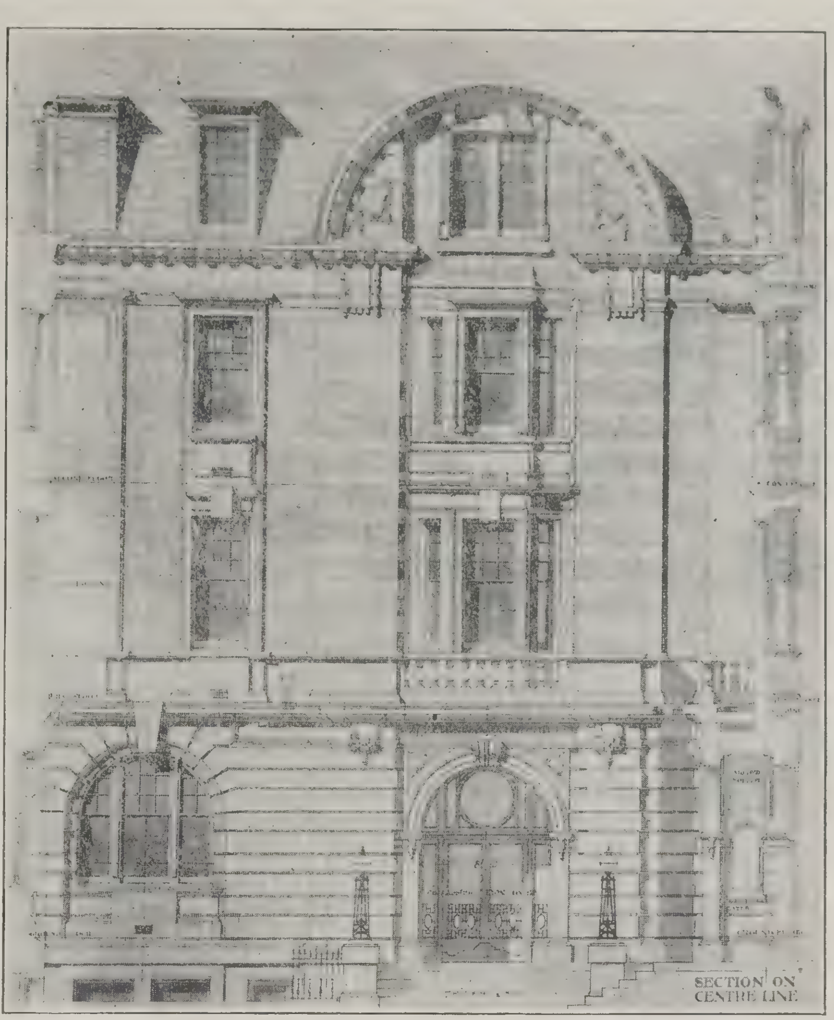
BUILDERS' BURNING QUESTIONS.

Hull Contract and Trade Practice.

At the meeting of the Yorkshire Federation held on September 17th, two or three matters of trade interest arising out of the relations of members with architects were carefully considered. Mr. E. Quibell, president of the Hull branch of the Federation, stated that they desired to call attention to what in their opinion was a hardship that had been suffered by one of their members. The member referred to had sent in a tender as subcontractor for the joiners' work in connection with a Council school, and amongst the several materials required was some floorboarding. This was specified to be of pitch pine, American first quality, *special selected straight grained*, free from sap, knots, and all other defects. In working out his quotation the joiner had obtained from various timber merchants prices to supply to this specification. A sample of the boards was submitted, and so far as the joiner was aware everything was satisfactory. The clerk of works saw the boards and had raised no objection. Upon delivery, however, they were ultimately rejected, the architect stating that he wanted *rift-sawn* boards. The joiner approached the timber merchant, whose price had been accepted, who of course refused to supply such boards at his previous quotation. A consultation then took place between the joiner and the city architect, when the joiner stated that he had not estimated for rift-sawn boards, and further that the specification did not provide for this quality. Some considerable delay ensued, and repeated interviews occurred on this matter. Finally the joiner proceeded to supply rift-sawn boards, on the understanding that at the finish of the contract he would have consideration shown to him.

Upon the final statement being presented, the joiner was unable to make any satisfactory settlement with the architect, and he approached the local association to assist him. He stated that the difference in price between the quality estimated for and that actually supplied was about one hundred pounds. The case was considered, and a deputation of joiners and timber merchants appeared before the Education Committee in support of his case. The deputation expressed the opinion that the specification was not definite, and would not be interpreted by them, with their practical experience and expert knowledge of the trade, to mean that rift-sawn boards were intended to be supplied. They further contended, as evidence on behalf of this, that rift-sawn boards had not been required for previous contracts, under similar conditions, and that the city architect, on issuing a specification for another school shortly after this dispute arose, altered the specification to read as follows: "The pitch pine to be American specially selected first quality, the flooring boards to be best quality specially selected pitch pine, *straight grained*, *rift-sawn*, free from sap, knots, and all other defects." This, they argued, on the face of it proved that the architect saw the necessity of altering the specification, and consequently the joiner ought, in view of all the circumstances, to have his claim allowed. After hearing evidence, the Committee asked the deputation to retire. As the statements were not controverted by the city architect, they were of the opinion that their ideas had been favourably received, and were subsequently considerably disappointed to learn that the Education Committee could not see their way to allow the additional amount claimed.

The Hull Association considered that the sub-contractor had been harshly treated, and, having regard to the expense of opening litigation with the Hull Corporation (especially bearing in mind that by the contract agreement the city architect was sole arbitrator), the contractors engaged on the work had agreed to share the loss in order that the retention money which had been outstanding for some time might be certified and paid



BERKS COUNTY COUNCIL OFFICES. SECOND PREMIATED DESIGN.
E. J. SHREWSBURY, ARCHITECT

Several members held very strongly that the joiner was absolutely correct in his interpretation of the quantities, as the quality insisted upon, being dearer in price, was consequently never calculated for by the trade unless explicitly described in the specification and quantities. Strong emphasis was again placed on the absolute necessity of contractors continuing their agitation for the more extended recognition and use of the contract form adopted by the R.I.B.A., and the paramount necessity devolving on all members to loyally decline to sign any contract which does not provide for the reference of all disputes to an independent arbitrator.

Dewsbury Dispute as to Extras.

At the same meeting of the Federation particulars were reported of a dispute which had arisen between a member of the Dewsbury Association and a local architect with respect to extras. Although the architect was a member of the Royal Institute of British Architects, he used a contract form in which he was appointed sole arbitrator, and by which the contractor became responsible for the accuracy of the quantities. Several members referred to the anomalous position of some architects' placing the onus of the accuracy of the quantities on the contractor, although they were compiled by the architect.

It was reported that the officers of the Federation had unsuccessfully endeavoured to obtain an interview with the architect with a view to arriving at a settlement if at all possible. The architect had, however, written to say that he was under the contract appointed sole arbitrator, and on no account would he surrender that position.

The Federation decided to call the attention of the trustees for the work under consideration to the recent legal decisions, and also to the fact that the architect was not using the contract form adopted and recommended by the Institute of which he is a member. It was further decided that the Federation should give every assistance in order to bring the matter to a friendly and successful issue.

Priced Schedules with Tenders.

The recommendation of the National Federation with respect to priced schedules with tenders was read. As this is in accordance with the custom and practice of the Federation for many years past, the president emphasised the necessity of members loyally co-operating in the strict observance of the recommendation, both in their own interest and that of the trade generally.

The Engineer as His Own Arbitrator.

The president drew the attention of the Federation to a decision by which the appointment of a city architect as sole arbitrator had recently been set aside by the Court of Appeal. The action was R. W. Blackwell and Co. v. the Mayor, Alderman, and Burgesses of the Corporation of Derby. The contract was for laying down a tramway, and the general conditions of contract contained a clause of inordinate length giving the borough engineer every conceivable power, and making any award by him final and binding on both parties. The date of completion was fixed, with a penalty of a certain sum per week failing completion at the time named. Although the time for completion was extended by about three months, the work was not complete at the expiration of this time, and consequently a deduction of £1,500 was made as liquidated damages for delay. The plaintiffs alleged that there was constant changing of plans from the time the contract was signed; that the Corporation delayed its decision as to certain interlacing lines and other important matters; and that the order in which the work had been agreed to be carried out was subsequently altered, thus rendering the material in hand useless, and necessitating the obtaining of other material before the work could proceed; that a reasonable amount of material was not allowed to be placed on the footpaths ahead of the work; and that an unusual number of samples of sand were rejected, apparently in an unreasonable way. In giving judgment, Lord Justice Fletcher Moulton expressed the view that any case of this kind must be decided on the facts, and that, where the nature of the dispute arising from the facts which were subsequent to the contract was such that the tribunal was not likely to be able impartially to deal with the dispute, it was open to the Court, and would usually be their duty to refuse to enforce the arbitration clause. In the present case the dispute was as to whether the engineer had not from the first acted unreasonably towards the contractor. It could not be said that the arbitrator was an unfit judge merely because he was an officer of the Corporation; but if facts subsequent to the signing of the contract had given rise to a substantial dispute involving allegations of continued unreasonableness on his part, the Court would not be acting in the spirit of the law if the dispute were referred to arbitration. In his opinion Corporations were often too fond of putting their officers in the position of arbitrators under a contract. Lord Justice Buckley, in giving judgment, remarked that the matter to be determined was whether the contractual referee was an unreasonable person. The worst possible referee on the question of unreasonable conduct was the person who was accused of being unreasonable. It was not human nature to suppose that he could properly determine whether he himself was an unreasonable person.

Warrington Corporation and Arbitration.

In a recent arbitration between Mr. Lawson and the Warrington Corporation, the usual clause declaring the engineer to be the sole arbitrator if any dispute arose was inserted in the contract, but the Corporation agreed to waive the condition, and consented to the appointment of an independent engineer for the purpose of ascertaining the amount in dispute.

The president and several members expressed satisfaction at these decisions, and hoped that they would have a beneficial effect in preventing architects and engineers being appointed sole arbitrators.—J. DAVIDSON.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns

By-laws for Building Inspectors.

SOUTHPORT.—SIDNEY writes: "I require the by-laws of the Local Government Board for the use of a building inspector in a large town. What should I ask for in order to get what I understand to be a comprehensive volume on the subject?"

Knight's Annotated Model By-Laws will probably best serve your purpose. Write for catalogue to Charles Knight and Co., Ltd., Tooley Street, S.E. It would be advisable also to apply for lists to Messrs. Eyre and Spottiswoode, New Street Square, E.C., and to Mr. B. T. Batsford, 64, High Holborn, stating your special requirements.

Stress Diagram for Hammerbeam Truss.

ORMSKIRK.—C. B. writes: "Enclosed is a frame diagram for a hammerbeam truss, loaded as shown, with reaction on left-hand side, vertical in order to obtain a maximum thrust on the right-hand side. The force diagram works all right until the nodes ringed round are reached, when point x on the force diagram cannot be found. There is evidently something inconsistent. Will you tell me what? If the reaction on the right be taken vertical obtaining the thrust on the left-hand side, there is no difficulty; but ought not the force diagram to be obtainable for either way?"

The elevation of the hammerbeam truss is shown in Fig. 1, and the frame diagram with loading as given by querist as in Fig. 2. Querist's inability to get the stress diagram to close up is easily accounted for by the fact that he did not obtain the true reactions. The correct diagram is shown in Fig. 3. Besides the stresses there shown, there will be bending moments on the curved members.

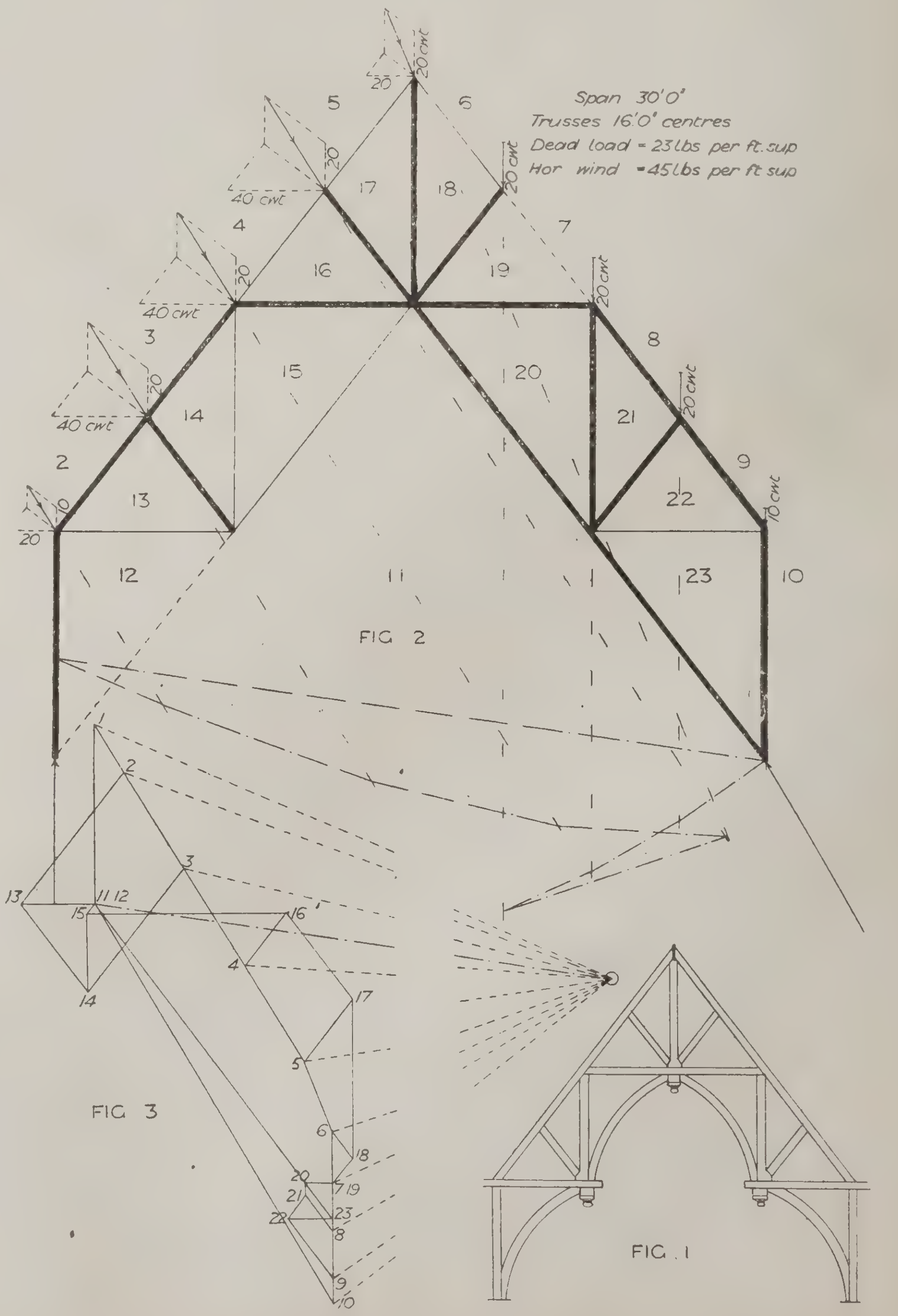
HENRY ADAMS.

In Parliament.

By our Gallery Representative.

Brick Clay as a Mineral.

An interesting point in last week's discussion on the Finance Bill was the admission by the Attorney-General that the Government had doubts as to the advisability of including clay as a mineral for taxation under their proposals. Only a few hours before this announcement was made, the Secretary to the Treasury informed the House as he had done on a previous occasion, that the Chancellor of the Exchequer was not prepared to introduce a special exemption for brick clay. The Government, not unnaturally, have declined to define the term "mineral." At present the courts are trying to do so. One appeal is under the consideration of the House of Lords—who are expected to give their judgment before Christmas—and the question involved relates to the working of sandstone.



STRESS DIAGRAM FOR HAMMERBEAM TRUSS. SEE ANSWER TO "ORMSKIRK."—C.B.

Refuse Destructors and Depreciation.

Mr. Samuel Roberts asked the Chancellor of the Exchequer whether land which had been depreciated in value or rendered valueless for building purposes by refuse destructors, smallpox, fever, or consumption hospitals being placed in close proximity to it by local authorities, would be subject to the proposed land taxes.

Mr. Hobhouse, Secretary to the Treasury, in reply said clause 14 of the Finance Bill provided that for the purposes of the land taxation provisions of the Bill, the value of the land would be its market value, which would allow for any depreciation due to surroundings.

Removal of Statues from Dublin Museum.

Mr. T. M. Healy asked the Secretary to the Treasury whether the Board of Works had taken down 12 statues of heroic size by the late Sir Thomas Farrell, P.H.A., which ornamented the façades of the Dublin National Library and Museum; when were these statues erected, and at what cost; was this an important element in the architectural scheme of these buildings, and were they to be replaced; were several of the statues damaged in course of removal; what expert advice was taken on the allegation that the statues were in danger of falling; was it the fact that only one statue had suffered dilapidation, and, if so, why, instead of restoring the injured statue, were they entirely taken away, unless it was intended to replace them by work equally graceful and ornamental?

Mr. Hobhouse, in a printed reply, stated: I am informed that the position of affairs is as follows:—The statues were erected in 1889. Pieces of them began to fall down about five years ago, and inspections were made from time to time by the architectural staff of the Board of Works to ascertain the condition of the stone, which was found to be bad in all three statues of each of the four groups. The parapet and other parts of the building were damaged by the falling pieces of stone, and finally it was decided in July last, after a further inspection, which showed that the stone could not be preserved or repaired, to take the statues down, as they constituted a grave danger to the public. All the figures showed signs of considerable disintegration, some very much more than others, and, though the operation was carried out with all possible care, the condition of nine of the 12 figures made further damage unavoidable. The original cost of these statues was about £800, and at least an equal sum would be required to erect groups now. The question whether or not similar groups should now be erected is under consideration.

Walmer Castle.

Sir John Benn asked the First Commissioner of Works whether he had suggested the free opening of Walmer Castle and grounds; whether objection to this was raised by the Walmer District Council; whether the Deal and Walmer Chamber of Commerce, representing the commercial interests of the whole district, had approved with practical unanimity of the free opening; and whether, in view of the fact that Walmer Castle was a building of national and historic interest, he could see his way to carrying out his original intention of removing the present restrictions to the free enjoyment by the public.

Mr. Harcourt, in a printed reply, stated that the answer to the first three questions was in the affirmative. In view of the unfortunate difference of local opinion, he did not intend to take any immediate action in the matter, but he hoped that the Walmer District Council might eventually find themselves more in accord with what he believed to be the general sentiment, so that he might be enabled to open this castle with its interesting historic associations to the public.

Housing and Town Planning Bill.

The amendments in the House of Lords of the Housing and Town Planning Bill have been described—for electioneering purposes—as "mutilation," "destruction," and "hopeless crippling"; but it is nevertheless evident that so far the really useful principles in the Bill have not been touched as yet by any item in the thirty-eight pages of amendments that stand on the order paper. The Peers have carried an amendment substituting independent inquiry for Local Government Board authority with respect to the compulsory acquisition of land against the will of the owner. A similar limitation was insisted on with respect to the compulsory enforcement of housing schemes. The Bill said that the Local Government Board could compel the local authority to "carry out such works and do such things" (in the way of pulling down houses and building others) "as may be mentioned in the order." The Peers decided that, before being enforced, the order must lie on the table of both Houses, and if either House within thirty days presents an address against the draft, the order of compulsion is null and void. This was carried by ninety-six to twenty-four, the Government vainly resisting. Nearly all the amendments have for their object the safeguarding of the individual from the oppressive exercise of compulsory powers.

FIREPROOFING AGRICULTURAL BUILDINGS.

One direction in which fire-prevention precautions have been greatly neglected is with respect to agricultural buildings, which, commonly constructed of wood, and sometimes stored with highly inflammable materials, fall an easy prey to the flames. In America, a newer tradition is being established. The barn and silo shown in the accompanying illustrations (see page 255) were designed by J. M. Madison, Caledonia, N.Y., for Mrs. John Jay Chapman, Barrytown, N.Y. The steel construction for the barn is of the truss frame type, anchored to concrete piers, carried from foundation to top of second floor. The floors on the second storey are of reinforced concrete with 12in. I beams, Clinton wire cloth being used as a reinforcement, the steel used in the structure being furnished by J. B. and J. M. Cornell Company, New York City. The concrete block used, both in the construction of the barn and silo, were made on the Hercules block machine, made by the Century Cement Machine Company, Rochester, N.Y. The second storey of the barn is designed to have a storage capacity for 200 tons of hay. The structure, as designed, is practically fireproof, and from this standpoint represents an economy in the erection of buildings for farm purposes.

THE LATE M. AUGUSTE CHOISY.

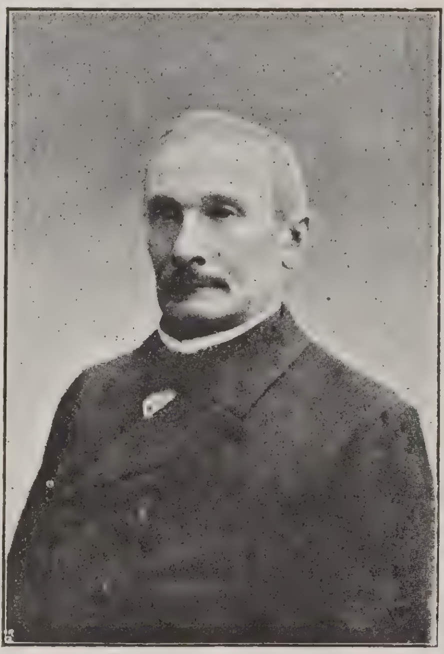
The sudden death is announced of M. François Auguste Choisy, the distinguished French architect and archæologist. Born at Vitry le François on February 7, 1841, he entered the Ponts et Chaussées, of which he became engineer-in-chief and finally Inspecteur Général Honoraire, and he was also professor of architecture in the Ecole of the corps. He was especially known for his studies in the history of architecture, and he did much to elucidate the methods of construction employed by the ancients. His works, which were remarkable for their clearness and conciseness of expression as

FIREPROOFING THE RAILWAY PLATFORM.

An interesting example of the extensive adoption of reinforced concrete for strength and fire-prevention at the Union Stock Yards, Chicago.

well as for the wealth of facts embodied in them, included a series of three treatises on the art of building among the Romans, Byzantines, and Egyptians respectively, and a volume of "Etudes épigraphiques sur l'architecture grecque." But his chief work was a "History of Architecture," which took him more than 20 years to bring to completion. He was also the author of two books of travel. M. Choisy's work was well known to architects and archæologists in this country, and in 1904 he was present in person to receive at the hands of Sir Aston Webb the Royal gold medal which was conferred on him by the unanimous recommendation of the Royal Institute of British Architects.

In presenting M. Choisy, on June 20th, 1904, with the gold medal of the R.I.B.A., the president, Mr. (now Sir) Aston Webb, recalled the titles of the works that have made M. Choisy famous wherever interest in such subjects is taken. They are "L'Art de bâtir chez les Romains," 1873; "Le Sahara," 1881; "L'Art de bâtir chez les Byzantins," 1882; "Etudes Epigraphiques sur l'Architecture Grecque," 1883; Histoire de l'Architecture," 1898; and "L'Art de bâtir chez les Egyptiens," 1903, together with other smaller works. The first of these great works, therefore, was "L'Art de bâtir chez les Romains," published in 1873; the last, "L'Art de bâtir chez les Egyptiens"—which, as one may say, has put a crown to M. Choisy's life work—was published so recently as the year 1903. In "The Art of Building among the Romans," M. Choisy first introduced us to the Roman search for an economical method of building vaults and domes. Alberti had already discovered how walls were built by the Romans, but he went no further, and the great marvels of the building of vaults and domes were still undiscovered. He has shown us, amongst many other things, how experience enabled the Romans to abolish the open network which kept the green centering in place, and how to adapt a single brick for the thickness of these great vaults of eighty feet span by inserting pieces of a second course to secure the corners at the junction, and by using the rubble or concrete filling in horizontal courses, the means probably adopted to equalise the pressure in the dome of Hadrian's Pantheon; all this is clearly shown in M. Choisy's illustrations. In his "Art of Building Among the Byzantines" he shows how the Romans, with diminished means, were enabled to build vaults without centering. M. Choisy's great work, the "History of Architecture," is a masterly exposition of the treatment of a subject from a single point of view. The result of fifteen years' strenuous labour, it is the history especially of architectural construction from the earliest times to the present. The innumerable line illustrations are nearly all the work of his own hands, drawn for the most part in isometric perspective in the inimitable manner of the French draughtsman. In his "Art of Building among the Egyptians," he has developed the theories set forth in the Egyptian section of his history, and concludes his researches into the methods employed for centering their great arches and in lifting their great monoliths. His work on "Greek Inscriptions" contains a series of studies in Greek inscriptions in the Arsenal of the Piræus, and the walls of Athens, and the Erechtheum. A marble slab was discovered with a complete specification for the building of the Arsenal. A noticeable point in M. Choisy's work is the clearness and conciseness of his style; for M. Choisy puts in three lines what many would have taken three pages to describe. M. Choisy's works are not merely historical accounts and records of buildings, but are the result of entirely original research and thought. It was on account of these invaluable scientific researches into the history of architectural construction contained in those volumes that M. Choisy received the Royal Gold Medal.


THE LATE M. AUGUSTE CHOISY.

Photocrom

YORK MINSTER.

This illustration shows the North Transept, where the recent fire occurred. (See p. 246.)

Federation News.

The Yorkshire Federation.

A meeting of the Executive Council was held at the Council Chamber, Town Hall, Bridlington, on Friday, September 17th. Mr. W. R. Thompson (president), occupied the chair, and was supported by 29 delegates from the associationns.

Councillor C. G. Southcott, Mayor of Bridlington, accompanied by Councillor J. V. Mainprize, Deputy Mayor, was present, and extended a hearty welcome to the Federation.

The president (Mr. Thompson), in tendering thanks to the mayor and deputy mayor, acknowledged the appreciation of the Federation for their kind welcome, especially bearing in mind the onerous duties of their office, which entailed much self-sacrifice for the services devoted to public affairs. He asked to be permitted to use the opportunity of inviting their kind attention and enlisting their sympathy in one or two matters of principle which had recently engaged the serious attention of the Federation. They were glad to hear that the Bridlington Corporation had not established a works department. The Federation had abundant testimony that these departments in other towns had resulted in serious loss to the ratepayers, while the efficiency of the work was in no case greater, but in many cases considerably less, than similar work carried out by contract. The Federation thought it was most unfair that the prestige and credit of public authorities should be used in direct competition with the interests of private traders. They were strongly of opinion that municipal trading should be exclusively confined to the recognised monopolies, i.e., tramways, gas, etc.

The Federation also strenuously objected on principle to the appointment of city engineers or architects as sole arbitrators. This was distinctly opposed to the recognition and enforcement by local authorities of standard conditions, as the Royal Institute of British Architects published an approved form of contract which contained an arbitration clause, together with other conditions which were fair and equitable for the proprietor, the architect, and the contractor.

The Federation further objected to the requirement of some engineers that the bills of quantities should be returned duly priced with the tender. In the opinion of the Federation, the proper course was for the contractor whose tender was accepted to be furnished with a further set of quantities, with a view to his filling up and completing same for deposit with the engineer or architect.

The Mayor informed the president and members that the matters to which their attention had been drawn would receive careful consideration as occasion required.

On the motion of the president, seconded by Mr. J. Biggin, the best thanks of the Federation were tendered to the mayor and deputy-mayor of Bridlington for their cordial welcome, and for placing the Council Chambers at the disposal of the Federation for the meeting.

Apologies for absence were reported from Alderman W. H. Jessop, J.P. (Huddersfield), Councillor W. Nicholson (Leeds), and Messrs. A. Moulson, and T. E. Taylor (Bradford), and P. Rhodes (Leeds).

The treasurer reported receipt of £40 16s. 6d. towards the National Reserve Fund. The Finance Committee reported that they had examined the accounts and recommended payment. On the motion of Mr. W. 1. Ledgard, seconded by Mr. A. J. Forsdike, it was resolved that accounts amounting to £39 3s. having been examined and certified as correct be approved, and that cheques be drawn in payment thereof. The treasurer reminded the members that the Federation had already entered on the last quarter of the financial year, and that the subscriptions to date were considerably less than the estimated expenditure for the year. He further pointed out that only six associations had sent remittances on account of the National

A FIREPROOF BARN AND SILO.

This barn and silo were designed and erected by Mr. J. M. Madison, of Caledonia, N.Y. It is built of machine-made concrete blocks on a steel framework. The second storey has a storage capacity for 200 tons of hay.

Reserve Fund, and that he still required a large sum to meet the payment of £190 0s. 10d. due by the Federation on or before December 31st. He earnestly appealed that these matters should receive urgent and earnest attention, in order that the Federation might honourably meet its obligations and maintain its record in this respect.

The president reported that the Finance and Emergency Committee, at a special meeting, had carefully considered the written observations of the local association with respect to the draft sub-contract form submitted for their consideration. After taking these carefully into account, the committee had made several alterations, additions, and amendments, and recommended a revised form for the consideration of the Council. The various clauses were read and considered in detail. It was ultimately resolved, on the motion of Mr. W. T. Ledgard, seconded by Mr. R. Raper, to refer the revised agreement to Mr. W. H. Hope, solicitor, for consideration, with a view to embodying the principles which were generally approved by the Federation in the said agreement.

It was reported that, in accordance with the invitation of the Federation, the National Conference of Secretaries would be held at the Hotel Metropole, Leeds, on Tuesday, October 19th. On the motion of Mr. A. J. Forsdike, seconded by Councillor W. G. England, J.P., it was decided that the Federation should provide tea for those who are present, and the Council earnestly urged that the secretary of each local association should be authorised and make arrangements to be present, and further requested the officers to attend as the official representatives of the Federation.

Mr. A. J. Forsdike reported that the Sheffield Association had given notice to the bricklayers' and joiners' societies, to expire on March 1st, 1910, for alteration of rules. The notice was: (1) to abolish walking time; (2) reduction of wages by ½d. per hour; (3) alteration of any other rule which might be necessary or advisable.

Correspondence was read with respect to the National Federation's opposition to Clause 30 of the Housing and Town Planning Bill. It was reported that the clause had been struck out in Committee, and that an attempt had been made on the report stage for its re-introduction, but the Speaker had ruled the amendments out of order.

The Federation considered the proposals of the Government with respect to unemployment, insurance, and labour exchanges.

It was pointed out that the building trade will be most seriously affected by any legislation dealing with these subjects, and it was resolved, on the motion of the president, seconded by Mr. A. J. Forsdike, to request the National Administrative Committee to take these matters into earnest consideration, and inform their members as to any action which should be taken for the protection of the trade generally and for the furtherance of employers' interests; especially bearing in mind the expressed intentions of members of the Labour party to obtain if possible provision in the labour exchanges for meetings of trade unionists, differentiation of unionists and non-unionists, and practically a suspension of the exchanges during trade disputes; and also their endeavour to secure that unemployment insurance shall be non-contributory so far as workmen are concerned.

Mr. Rushford, president of the Grimsby Association, stated that a local architect was in the habit of giving the final certificate to the building owner, instead of to the contractor, and asked for an expression of opinion as to the prevailing custom in other towns. The secretary was instructed, on the motion of Mr. A. J. Forsdike, seconded by Councillor J. Dawson, to obtain information as to whom the final certificate is usually sent by architects—the proprietor or the contractor; and to ascertain whether this point is covered by any agreement with the R.I.B.A. or any other institute.

Mr. Rushford, president of the Grimsby Association, asked for information as to experience of builders in other towns, where the tenure is leasehold, as to charges for licences for converting dwelling-houses into business premises. In Grimsby, agents of landowners are enforcing surveyors' and solicitors' charges in addition to increasing the amount of the ground rent, and these charges were now becoming very onerous.

Information on this matter will be much appreciated by the Federation secretary.

It was reported that the Selby Association had invited the Federation to hold the next meeting in that town. The invitation was cordially accepted, and the meeting was arranged for Thursday, October 21st.

The president and members of the Bridlington Association entertained the delegates to tea, and a hearty vote of thanks was accorded for their hospitality.—J. DAVIDSON.

Lancashire, Cheshire, and North Wales Federation.

The quarterly meeting of the plasterers' trade committee of the Lancashire, Cheshire, and North Wales Federation was held at the George and Dragon Hotel, Ashton-under-Lyne, on Wednesday, September 22nd, when Mr. James Higson, J.P., Manchester, presided. The attendance was only very moderate.

Matters of general branch trade interest were discussed, the most important being the Government price list and schedule for daywork. It was pointed out by several members that this list was much below the current rates for labour and materials, and the secretary was instructed to endeavour to obtain copies of the said lists and measure bill, so that the matter could be further discussed at the next meeting.

It was decided to hold the next meeting in Liverpool.

A paper on "The Sub-contract Form" was to have been read, but owing no doubt to unforeseen circumstances, the gentleman who had promised to prepare it was prevented from attending.

The representatives were afterwards entertained to tea by the local employers, to whom a very heartly vote of thanks was recorded.—JOHN TOMLISON, secretary.

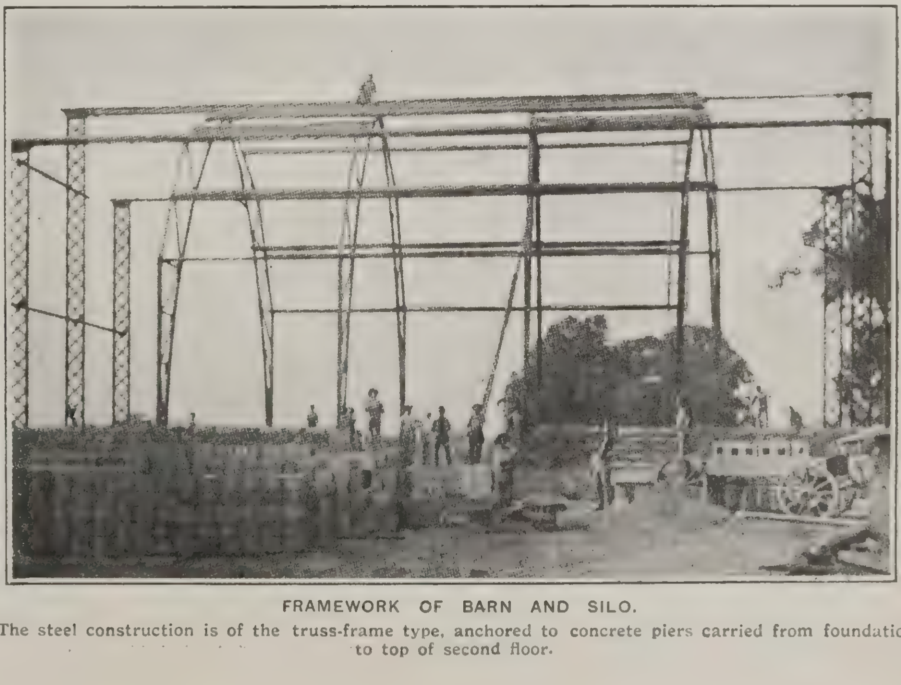
MANCHESTER, SALFORD, AND DISTRICT ASSOCIATION.

Secretary: John Tomlison.

The monthly meeting of the General Committee of the Manchester, Salford, and District Association was held at the Boardroom, Blackfriars Street, on Thursday afternoon, September 16th, at 3.30 o'clock, when the president (Mr. Samuel Gerrard) presided over a well-attended meeting.

Five new members were elected.

Some discussion took place on the question of municipal trading by the Manchester and



FRAMEWORK OF BARN AND SILO.

The steel construction is of the truss-frame type, anchored to concrete piers carried from foundation to top of second floor.

Salford Corporations, but ultimately it was decided to place the matter on the agenda for discussion at the next meeting.

It was reported that as the result of an advertisement appearing in the local Press for priced schedules to be sent in along with tenders for the erection of an underground lavatory in the city, a deputation from the association waited upon the City Surveyor at the town hall a short time ago, and after discussing the matter with them, he had consented to withdraw the condition.

It was reported that the Master Stonemasons had now disbanded their separate organisation in favour of this general association, which was considered satisfactory.

OLDHAM AND DISTRICT ASSOCIATION.

Secretaries: Cowper and Dean.

About 35 members of the Oldham and District Master Builders' Association attended the annual picnic, the place selected being Nottingham. After luncheon at the Victoria Hotel, the party went by coaches over Trent Bridge to Radcliffe, visiting Tollerton Hall, Cockgrave, and other places of interest. After four hours' drive, the party arrived back in Nottingham about 4 p.m., and in the interval before dinner various places of interest in Nottingham were visited, including Nottingham Castle, Arboretum, and the famous market. After dinner at the Victoria Hotel, the party left Nottingham at 7.17 p.m. The Picnic Committee comprised Messrs. Wm. Rose, R. C. Fletcher, and E. Dean (secretary), and the arrangements were carried out by Messrs. Cook and Son, the tourist agents. During the outing several photographs were taken by Mr. John Smethurst, son of the president, Councillor Samuel Smethurst, J.P.

Law Case.

Japanese and Austrian Oak.

In the City of London Court, at the Guildhall, Judge Lumley Smith and a jury concluded the two days' hearing of a case in which Messrs. W. W. Howard Brothers and Co., timber merchants, sued Turpins Parquet Floor Joinery and Wood Carving Company, Limited, of Bayswater, for £46 7s. 3d. for Austrian quality parquet flooring supplied. The defendants counter-claimed for £58 9s. 4d. as damages for breach of contract on the part of the plaintiffs in not supplying "perfectly seasoned oak flooring," and they said that instead of sending Austrian oak the plaintiffs had supplied Japanese timber. The plaintiffs said they had never undertaken to sell Austrian logs. They undertook to supply "Austrian quality" oak, and Japanese was now taking the place of Austrian oak. Austrian oak had now become almost impracticable for trade purposes. It was exceedingly dear, the quality had greatly changed in the last few years, and there was very little of it used. Japanese was in every respect equal to Austrian oak. The defendants called experts to show that Japanese oak was not as serviceable as Austrian, that it took much longer to dry, and that it had been imported only during the last three or four years. Austrian oak, it was said, was infinitely superior to any other for flooring purposes.—Judge Lumley Smith said he hoped English oak was still being used, and he was told it was. The jury found for the plaintiffs on the claim and counter-claim.

Trade and Craft.

"Aston" Electric Radiators.

Now is the time of year when heating engineers are busiest, and, very opportunely, Messrs. Veritys Ltd., of 28 and 31, King Street, Covent Garden, and of Bristol, Birmingham, Manchester, Liverpool, Newcastle, Glasgow, Dublin, and Leeds, have published a compact little booklet showing, with copious illustrations, their "Aston" luminous and non-luminous type electric radiators. These are of many patterns, some of which are really elegant; and they are of diverse materials—copper, bronze, antique silver finish, brass, and wrought iron; and, by size, shape, and appearance, they are severally fitted for almost every kind of environment, from business office to boudoir. It is a very serviceable list.

Uralite Fireproofing Specialities.

The British Uralite Company, Limited, 16, St. Helen's Place, London, E.C., have recently added to their ordinary manufacture of uralite and asbestone (cement slate), fireproof plaster partitions of the following sizes: width, 12ins.; length, 4 or 6ft.; thicknesses, ⅝in. to 2ins., ¾in. to 2½ins., 1in. to 2¾ins., 1¼ins. to 4ins., 1½ins. The main ingredient of this partition is asbestos fibre, which renders it absolutely fireproof and sound proof. The use of reeds is avoided, and consequently vermin and moisture are not harboured. The material has great strength, is readily erected, and can be sawn and nailed in the same manner as ordinary boarding. We are promised further particulars of these partitions. This firm's products are fireproof, non-conducting, clean and dry, and can readily be fixed to roofs, walls, ceilings, partitions, etc., by an ordinary carpenter. The fact that the London County Council, H.M. War Office, H.M. Office of Works, and H.M. Admiralty, have adopted them to a very large extent, partly accounts for their increasing popularity. Uralite and asbestone are made in flat sheets up to 6ft. by 3ft., and from 1-16in. to 1in. in thickness. The company report a rapidly increasing output of asbestos-cement roofing tiles. So great has been the demand for these tiles, 200,000 having been shipped in one consignment to the Argentine, that the company have been obliged to install an additional machine capable of producing 1,000 tiles per hour. A roof constructed of these tiles is shown at the Uralite Pavilion, which is situate outside the Machinery Hall at the Great White City.

The State of the Timber Market.

Messrs. Denny, Mott, and Dickson, Ltd., in their wood market report, dated September 2nd, state the landings in the docks in London during August consisted of 563 loads of logs and 479 loads of planks and scantlings, or a total of 1,042 loads, as against 476 loads for the corresponding month of last year. The deliveries into consumption were 387 loads of logs and 183 loads of planks and scantlings—together 570 loads, against 385 loads for August, 1908.

Mahogany imports during August were very light, being, however, somewhat augmented by the recent arrival of small lots of Honduras and Tobasco. There were no public auctions during the month, and the market was generally stagnant and depressed. The market for Canadian waney pine has been necessarily quiet, the stocks being so small. Prices are very firm, as there is little or no prospect of any further shipments coming to hand this season. Elm has been quiet, but prices are well maintained, as the stock is modest. Oak of good dimensions continues to be in demand.

The demand for spruce for the outports has been good, and both landed and c.i.f. prices show a tendency to stiffen. The demand for pitch pine has been dull, and although the landed stock continues to be moderate, prices have been slightly easier notwithstanding that shippers demand higher c.i.f. prices for cargoes, owing to the increasing home demand in the United States for this wood. The Oregon pine market has been without feature, but prices are well maintained in face of the higher c.i.f. cost. The bulk of the season's supplies of Odessa oak having been shipped direct into consumption, the landed stocks are now very small, necessitating a hand-to-mouth class of business at very firm prices. A renewal of activity in this market can only come with next year's fresh season's shipments. Last month business in Baltic and White Sea goods was unusually active for August on account of the strong market. A distinct rise has taken place in the lower qualities of White Sea goods. Shippers have practically sold out redwood, except for small and unattractive balances. The labour troubles in Sweden still dragged on, though to some extent shipping still continued at certain ports. Should a settlement not be arrived at in time to remove goods sold, the result will be a big shortage in supply during the winter months. The actual consumption does not show any great improvement, although there is promise of much improved business after the holidays. The volume of business during such a holiday month as August has been better than might have been expected, and there are growing signs of sounder all round business, although the improvement is too gradual to be very perceptible. Perhaps this fact is encouraging rather than otherwise, as it minimises the chance of any set-back.

Rumoured Brick Trade Combine.

There are rumours of a proposed "combine" among the brickmakers of the United Kingdom. The report is denied by several large firms, but the present condition of the trade is such as to suggest some kind of remedial measure. It is reported that the output is at present less than it has been for thirty or forty years, the demand being so low as to employ only 50 per cent. of the total working capacity of the country. This superfluity of capacity is accounted for by the present slump in the building trade, and also by the great number of yards in existence. These works sprang up at the time of the great boom in the building trade some years ago, and now that the building trade has sunk practically to zero the supply is more than double the demand. As a result, many yards have had to be closed, whilst in those which have continued working millions of bricks have accumulated. There is much competition for the little trade obtainable, and the works have to accept orders almost at a loss in order to keep their yards employed.

Insurance.

Subscribers to "The Builders' Journal" are entitled to a Free Insurance for £500. Every subscriber should apply for this, sending a postcard with the name of the newsagent with whom the order has been placed. Subscribers can also obtain a General Accident and Sickness Insurance (the "Lighthouse" policy) at a reduced premium, which includes the Annual Subscription to this Journal. A pamphlet giving full particulars can be obtained free on application.

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Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Abertillery.—For the extension of the central girls' school, for the Urban District Council Education Committee. W. H. Hiley, architect, Chapel Street, Abertillery. Quantities by the architect:—

	£	s.	d.
Skidmore and McWhirter, Alexandra Road, Abertillery	£1,441	2	4
J. Jones, Powell Street, Abertillery	1,221	10	0
A. J. Colborne, Swindon	1,189	0	0
R. Tudor, Alma Street, Abertillery	1,177	0	0
J. N. Morgan,* 9, Grafton Road, Newport (Mon.).	1,100	0	0

* Accepted.

Abertysswg.—Accepted for building a cottage hospital for the Abertysswg Workmen's Doctors' Fund. A. F. Webb, architect, Blackwood.

T. Mathew, £2,037 5s.

Birmingham.—For erection of workhouse infirmary, matron's house, for the Guardians. W. H. Ward, architect, Paradise Street, Birmingham:—

	£	s.	d.
C. Copeland	£1,087	3	7
Walton Bros.	980	0	0
A. C. Hughes	920	0	0
W. Sapcote and Sons	875	0	0
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W. J. Morris	788	0	0
S. F. Swift	787	0	0
G. Webb, Staffordshire	755	0	0
E. Crowder	697	0	0

Rest of Birmingham.

Cardiff.—Accepted for alterations and additions at the Ely Workhouse. Mr. E. Seward, F.R.I.B.A., Queen Chambers, Cardiff, architect.

Allan and Son, £3,931

Colbren, near Seven Sisters (Wales).—For erection and completion of a new Welsh Baptist Chapel. W. Beddoe Rees, architect, 3, Dumfries Place, Cardiff:—

	£	s.	d.
T. Samuel, Station Road, Abercave	£2,074	0	0
W. Williams, Pearl Street, Cardiff	1,595	0	0
E. Turner and Sons, Penarth Road, Cardiff	1,488	0	0
R. Jones, Post Office, Abercave	1,475	15	0
Thomas Bros., Ympderw Yard, Pontardawe	1,475	0	0
J. Williams, Ystalyfera, Swansea Valley	1,464	11	8
H. Smith, Wolverly and Worcester Cross, Kidderminster	1,412	0	0
Radford and Greaves, Drewry Lane, Derby	1,408	0	0
J. H. Maggs and Co., 35, Domilly Crescent, Cardiff	1,366	11	0
R. Jones, Brynawel, Abertridwr	1,337	19	5
Parkinson and Hodgens,* 5, Nicholl Street, Swansea	1,284	6	8

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Knight	4,437
Ellingham	4,420
Thomas and Edge	4,300
Holliday and Greenwood	4,262
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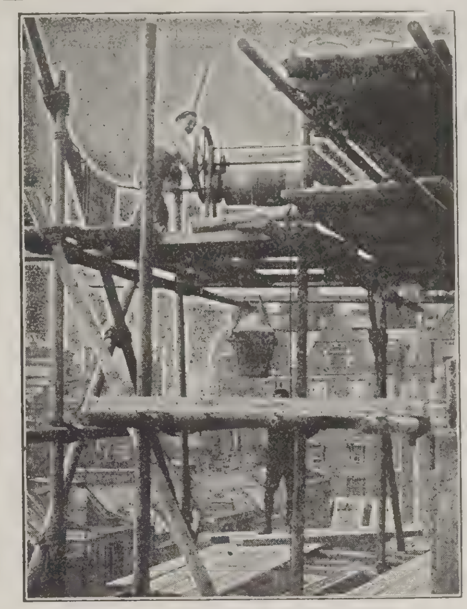

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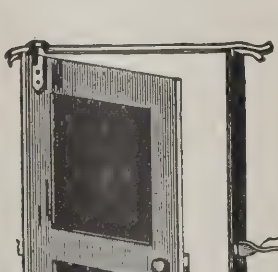

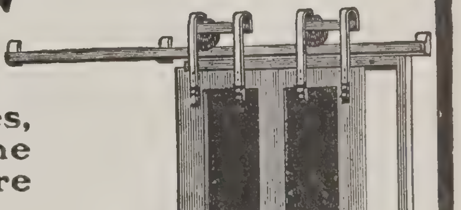

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(Tenders continued from page vi.)

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H. W. Harris, Bristol	£2,305	4	8
Samuel Lovell, Bristol,	2,114	0	0
T. R. Lewis, Bristol	1,956	0	0
J. Browning, Bristol	1,850	0	0
T. Lovell and Sons, Bristol	1,813	0	0
J. Perkins & Sons, Ltd., Bristol	1,740	0	0
C. A. Hayes and Son, Bristol	1,735	0	0
Stephens, Bastow, and Co., Ltd., Bristol	1,735	0	0
E. Price, Bristol	1,730	0	0
S. Slaughter, Bristol	1,726	0	0
E. Clark and Sons, Bristol	1,720	0	0
E. Love, Bristol	1,705	0	0
Walters and Son, Bristol	1,631	0	0
Orchard and Peer, Stroud	1,579	0	0
W. T. Nicholls, Gloucester	1,564	0	0
Byard and Son, Gloucester	1,523	0	0
Adams and Jefferies, Bristol	1,458	0	0
A. G. Heard,* Bristol	1,443	16	6

*Provisionally accepted.

London, S.E.—For the erection of new building upon the site of Nos. 258 to 262, Westminster Bridge Road, S.E., and site of hall at rear of No. 256, for Joseph Lyons. Joseph and Smithem, architects, 83, Queen Street, Cheapside. Quantities by Chas. W. Latter:—

Simpson and Sons	£8,279
C. Bovis and Co.	7,941
Dove Bros.	7,898
F. G. Minter	7,864
Higgs and Hill	7,864
J. Carmichael	7,795
Colls and Sons	7,712
Holliday and Greenwood	7,698
Holloway Bros.	7,590
W. Downs	7,539
Wallis and Sons	7,490

Mitcham.—For supplying and erecting an iron building, 100ft. by 25ft., and for supplying and erecting about 540 yards run of galvanised iron fencing at Homewood Road, for the Croydon Rural District Council. R. M. Chart, F.S.I., surveyor:—

Humphries, Ltd., Knightsbridge, London	£839	0	0
Ginger, Lee and Co., Plymouth Avenue, Manchester	820	0	0
F. Smith and Co., Carpenter's Road, Stratford	724	10	0
W. Harbrow, South Bermondsey Station, S.E.	690	0	0
Atkinson and Co., 19, St. Dunstan's Hill, E.C.	684	0	0
Hill and Smith, 118, Queen Victoria Street, E.C.	620	0	0
Boulton and Paul, Ltd., Norwich	614	19	0
Baldwins, Ltd., Fenchurch Street, E.C.	£594	5	0
F. W. Cross and Co., 35, Park Street, Walsall	577	17	0
Norton Bros., and Co., 29, Cranbrook Park, Ilford	575	0	0
Priest and Son, Ltd., Castle Ironworks, Bristol	540	0	0
W. Bain and Co., 122, Cannon Street, E.C.	540	0	0
Hayward and Sons, Laurence Poutney Hill, E.C.	520	0	0
General Iron Foundry Co., 43, Upper Thames Street, E.C.	518	0	0
T. W. Palmer and Co., 5, Victoria Street, Westminster	498	19	6
Walker Bros., Ltd.,* Victoria Ironworks, Walsall	484	15	0

Surveyor's estimate, £560.

*Accepted.

Radcliffe.—For United Methodist Church in Ainsworth Road. J. D. and S. J. Mould, architects, Bury, and 52, Queen Victoria Street, London:—

Blomley and Co.	£2,880
Gibson and George	2,860
Allen	2,705
R. and T. Howarth	2,625
Porter,* Bury	2,527

*Accepted.

South Elmsall (Yorks.).—For the erection of brick church, to hold 500. J. Nicholson Johnston, A.R.I.B.A., architect, Yeovil, Somerset:—

W. Hanley, Hemsworth	£5,063	10	0
Rhodes Bros., Shipley	4,641	0	0
F. R. Bartlett, Yeovil	4,519	11	6
E. E. Dickinson, Bolton-on-Dearne	4,441	0	0
G. F. Kirk, Chesterfield	3,857	13	10
Swift Bros., South Elmsall	3,849	5	0
D. Gill, Doncaster	3,821	15	0
Salmon and Co., Cudworth, Barnsley	3,567	0	0

Springfield.—For alterations and additions at Cuton Hall, Springfield. Charles and W. H. Pertwee, architects and surveyors, Chelmsford and London:—

W. Fincham	£739	0	0
J. Gowers	720	0	0
F. Weight	718	0	0
T. J. Bailey	694	17	0
Baker and Sons,* Danbury	642	0	0

*Accepted.

Springfield.—For proposed house at Springfield. Messrs. Charles and W. H. Pertwee, Chelmsford and London, architects and surveyors:—

W. Fincham	£2,221	15	8
Ghoat and Son	2,150	0	0
J. Gowers	£1,980	0	0
Johnson and Hawkes	1,977	0	0
H. Potter and Son	1,895	0	0
T. J. Bailey	1,872	0	0
F. Weight,* Chelmsford	1,850	0	0

* Accepted.

Tunstall.—For culverting, etc., and erection of a pavilion at the Park, for the Urban District Council. Accepted tenders:—F. Barke, Stoke, for culverting the brook at the south-east corner of the Park, £266 18s. 9d.; P. Pemberton, Tunstall, for the erection of a pavilion at the Park, £1,238 10s.

Walsall.—For the erection of St. Patrick's Presbetery, Walsall. Mr. Henry T. Sandy, architect and surveyor, 22, Greengate, Stafford.

	Guiting Stone.	Alton Stone.		
William Bishop	£2,479	£2,522	0	0
Thomas Tildesley	2,475	——		
Thomas Mason	2,463	2,483	0	0
S. Wooton	2,435	2,460	0	0
William Wistance	2,364	2,384	0	0
H. Willcock & Co.	2,289	2,319	19	0
T. & S. Ham	2,290	2,290	0	0
J. Barnsley & Sons	2,266	——		
W. Kendrick & Sons*	2,110	2,110	0	0
H. Gough & Sons	2,075	2,105	0	0

*Accepted on account of earlier completion being undertaken.

Wimbledon.—Accepted for the erection of the Technical Institute Extension.
Spencer, Santo and Co., Kensington, £8,310.

Wimbledon.—Recommended for acceptance for installing heating system at the Isolation Hospital, for the Borough Council
Strode and Co., Regent's Park, N.W., £639 10s.

Wincanton.—For new hospital buildings and roads, drains, etc., for the District Isolation Hospital Committee. A. J. Pictor, A.R.I.B.A., architect, Bruton, Somerset:—

T. Lydford	£2,323	1	0
R. G. Spiller	2,036	0	0
S. Dodimead and Sons	1,958	0	0
A. Wills and Sons	1,940	10	0
E. G. Padfield	1,931	7	10
Wort and Way	1,879	17	7
J. Long and Sons	1,860	0	0
H. Pittard and Sons	1,852	10	0
E. Chancellor and Sons	1,840	0	0
Sainsbury Bros.	1,821	2	11
T. Stockham	1,775	10	0
T. S. Hobbs	1,764	7	2
Sweetman Bros.	1,763	3	0
G. Moore and Sons	1,746	0	0
R. J. Stead	1,737	0	0
C. Bryer, jun.,* Bridgwater	1,684	0	0

*Accepted.

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Architectural Refinements.

The controversy on architectural refinements—as to whether, as claimed by Mr. W. H. Goodyear, certain observed bulging and recessing is, like entasis, due to deliberate design, or whether, as his opponents contend, it is the result of mere accident—drags its slow length along. In the October issue of the Journal of the R.I.B.A., Mr. Goodyear replies to Mr. Bilson's rejoinder, and brings forward a mass of data in support of the contention that the early builders were keen on optical effects, and deliberately abjured the plumb-line in order to achieve an appearance of plumbness by correcting optical illusions. They had, apparently, what Mr. Aymer Vallance would call "a letch for vistas." We will not enter into a controversy that seems likely to go on for ever; but we cannot help remarking that both parties to it seem disposed to push matters to extremes. It is fatally easy to become obsessed either of a theory or of the negation of a theory; and it seems to us that the parties to this controversy are rather too uncompromising, the one side in assertion, the other in denial. We hardly venture to doubt that the principle of entasis, or of optical correction, may have been occasionally employed, but this admission does not commit us to the theory that every bulge is intentional; nor, on the other hand, can we admit the validity of the argument that because such phenomena are often due to settlement, this accident invariably accounts for them, and utterly destroys the theory of refinements. This, we admit, looks like trimming, but we venture to suppose that it comes very near the truth. As a last word on a rather arid subject, we would gently hint that the somewhat excessive refinements observable in the arguments appear to be occasionally derogated in the language in which they are expressed; but the whole controversy is so bewildering that we really do not know whether to attribute the occasional split infinitives to accident or design. Perhaps these also are sometimes intentional, but more often accidental. We should not have mentioned so trivial a matter if it had not seemed to us to be rather significant of possibilities in architecture proper as well as in what the London County Council Education Committee calls "word-architecture." If the writers had succeeded in absorbing our attention in their yawning fissures, we should have had no eye for the splits. *De minimis non curant* when there are bigger things toward. But we certainly admire the pluck and thoroughness with which Mr. Goodyear has thrown himself into his rather thankless task.

Labour Exchanges.

Very opportunely, a writer in the "Contemporary Review" for October gives a most instructive account of the inception and progress of the Central-Verein für Arbeits-Nachweis, which may be more conveniently called the Berlin Labour Exchange. As there can be no doubt that our own labour exchanges will be largely based on the Berlin model, authoritative information on the subject is very welcome, and we have ourselves made arrangements for first-hand investigation of the history and methods of an institution that, through its offshoots, seems destined to have an important bearing on the industrial economy of our own country. The writer in the "Contemporary" has nothing but praise for the exchange. He describes it as "the missing link between employer and employee—between work-giver and work-taker." It began in a very small way in 1883, when possession was taken of five railway arches in the city, which were used as registry offices for unskilled workers of both sexes, and for locksmiths, plumbers, and painters—that is, apparently, for the skilled workmen with whom employment is apt to be peculiarly intermittent. It was found to be doing such excellent work, that the National Insurance Institution agreed to assist its development into a labour exchange. The central authority offered to erect a building at a cost of £55,000, provided the Berlin Municipality would give an annual subsidy of £1,000. A site was found in the Gormann-strasse, not far from the Bourse, and the Labour Exchange proper was opened in 1902. There seems to be not the smallest doubt as to its success. The number of applications has risen from 42,829 in 1902, to 158,098 in 1907, and the municipal subsidy has been increased to £3,000. The administration is in the hands of a Board of 21, who are assisted by a special executive committee representing both employers and employees, and it is added that the virtue and strength of the Exchange arise from the fact that it is thus officered by men of practical knowledge and experience. The Exchange is perhaps unique among German institutions in its freedom from red tape and from all harsh forms of officialdom. The business is conducted with the utmost kindliness and courtesy, so that the persons using it are not in the smallest danger of losing their self-respect. The Exchange building, which accommodates about 4,000 persons, is in fact a sort of club-house for the unemployed, who find in it a welcome refuge from the streets, and who can obtain at its canteen bar a satisfactory meal for 3¾d., "winding up with a cigar!" The visitor was much struck by the cleanly and cheerful appearance of the frequenters, and as we have said, he has full confidence in the utility of the institution. Of course, it is not a panacea for the many and various causes of unemployment. It does not create work, but it saves much unnecessary waste of time and effort on the part of both employer and employed by providing a fixed rendezvous where the twain may easily find each other, and in many ways it is undoubtedly an excellent industrial asset, to say nothing of its mitigation of the hard lot of the unemployed.

The Town Planning Bill in Danger.

There has been a good deal of wild talk about the amendments to the Town Planning Bill that have been carried in the Lords. It has been declared that the Lords have "wrecked the Bill," that they have "completely knocked the bottom out of it," and so forth. Whether or not one approves of the action of the Lords, it must be acknowledged that this description of it is grossly inaccurate. So far, the Lords have left the vital principle of the Bill absolutely untouched. They have simply revised the methods of procedure in the case of compulsory purchase, so as to safeguard the interests of the individual against the possible tyranny or caprice of the oligarchic few who happen for the time to control or direct the action of the Local Government Board. The reception of the Bill in the House of Lords has been, on the whole, very far from antipathetic. The real peril comes from the unscrupulous political partisans who are ever ready to sacrifice the welfare of the community to the exigencies of the political situation —who will, in short, do or say anything in order to catch votes. If the misrepresentation of these opportunists are allowed to prevail, upon their heads, and not upon the House of Lords, will rest the guilt and the odium of destroying a measure that is on all hands acknowledged to be rich in promise for the well-being of the community. As to the ultimate fate of the Bill, much no doubt will depend upon the temper of Mr. John Burns. If he keeps a cool head, and takes the Lords' amendments philosophically, all may yet be well. If, on the other hand, he hearkens to those who, for obvious reasons, are striving to convince him that he is being flouted and contemned, and that the years of strenuous labour he has devoted to the Bill are being brought to naught, we may witness the indefinite postponement of much-needed reforms. We can only trust that wise counsels will prevail, and that Mr. Burns will persevere in the firmness and moderation that during recent years have won for him a reputation for sound, solid state-craft.

California and Architectural Credentials.

They have done it, those practical and downright Americans. We shall never do it, but shall for ever keep on talking about it, and threatening to do it. They have convicted a man for practising as an architect without having first obtained a certificate from the State Board of Architecture. It was in California. They did not lynch him. Perhaps his offence was merely trifling and technical. We are hardly in position to judge of that, the language in which it is described being too severely technical to admit of exact interpretation in this country. He "had a shingle out." That was his offence. Then he had to have it out with the police-court president, who let him off with a nominal fine. That was last year. He appealed, and "while his appeal was pending, he took the required examination and secured a certificate." He took nothing else by that deal. possibly his tardy act of repentance may have prevented his being lynched or electrocuted. It did not win his appeal. Judge Willis, of the Superior Court, was inflexible. That is not surprising. We also have a Judge Willis, and should rather like to swop ours for theirs; for their Judge Willis's decision "establishes for the first time the right of the State Boards to prosecute architects not holding proper credentials" and yet daring to have a shingle out. The culprit's attorneys vainly sought his acquittal on the ground that "the Act calling for certificates is unconstitutional, and that it grants special privileges," including, it may be assumed, that of having a shingle out. In England this line of argument has hitherto prevailed, insomuch that the uncertificated might with impunity not only have a shingle out but build a cathedral in the Grand Manner. We are afraid, however, that this shingle instance from California is not likely to help forward the Registration movement very materially.

The Architect in Farce.

The ingenious authors of the A.A. plays have a serious (but no; the adjective is inappropriate; let us say formidable) rival in F. Anstey, the author of the new and diverting fantasy of "The Brass Bottle," now being performed nightly at the Vaudeville Theatre, London. The playwright has chosen, for good and sufficient reasons, to make his hero an architect. This gentleman, one Horace Ventimore, of the somewhat unappreciated firm of Ventimore and Pringle, has nothing better to do than to examine with leisurely curiosity a large brass bottle that has been bequeathed to him by an adventurous relative. He is curious to see what, if anything, is inside it, and he breaks the seal. In the act he releases a regulation Arabian Nights genie or Djin, who forthwith becomes his devoted and overwhelmingly obsequious slave. Is there anything that the architect earnestly desires? Well, for once in a way, he would like to experience the novel sensation of having a wealthy client. Bang! Wackerbath, a stupendously rich man, is precipitated through the window of the architect's office, and a commission for a £100,000 house is at once given. The result is the construction, on hey-presto but unhygienic principles, of a palace showing so much oriental feeling that the client is moved to complain of its slavish imitation of the Brighton Pavilion, while the architect points out that it is entirely lacking in modern conveniences, and that the sanitary arrangements are scandalously inadequate — no local authority, however lax, would dream of passing them. Irritated by these criticisms, the Djin causes the palace to melt away, and punishes the captious client by making him run on all fours and bark like a dog. Finally, the architect is threatened with annihilation unless he will consent to seal up again in the brass bottle the disappointed and disgusted Djin. It is a very merry little play. Purple Patch, the immortal of the A.A. annual, will have to look to his laurels. In this competition the first premiated design is that submitted by the Djin. The fact that it is impracticable does not weigh with the assessor.

Bricks and Victory.

Apparently Mr. Lloyd George has thought discretion the better part of valour. The Attorney General has announced, in the House of Commons, that "the Government doubted if it would be advisable to include clay as a mineral." As we are not of the Yellow Press, we do not claim full credit for this change of front; yet it is a curious (we do not say a significant) coincidence that the Attorney-General surrendered this point in the evening of the very day on which our emphatic protest appeared! The credit of the victory belongs chiefly to Mr. H. Greville Montgomery, M.P., who had organised opposition to such good purpose that he not only enlisted almost the entire Press of the country on his side, but had received promises of support from about fifty members of Parliament, and would certainly have challenged a division on his amendment to exempt brick clay from the operation of the clause. As to the question of whether clay is or is not a mineral, it is odd to note, as one of life's little ironies, that the very persons who have of late been most strenuously contending that clay is not a mineral were not so long ago trying hard to prove that it was a mineral. That was when they were claiming compensation for it when the land containing it was to be compulsorily acquired for railway construction. Although their position seems at first sight paradoxical, who shall say that they are not justified in both contentions? But, as old Kaspar said, it matters not how that may be—"it was a famous victory," and Mr. H. G. Montgomery deserves at least a life-membership of the honourable "Association of Cemented Bricks," if that select organisation is still in existence. Jubilation over this victory, however, does not render us oblivious to the fact that there are other battles to fight. The price of bricks is likely to be affected even more seriously by the enhanced price of coal than it would have been by the preposterous tax on clay. The exemption of other materials is recorded on p. 266.

THE OLD BATH CONTROVERSY.

The controversy over the proposed extension of the Grand Pump Room Hotel at Bath is being revived. The proposed extension, it will be remembered, necessitated the demolition of the colonnade on one side of the street, thus destroying a vista that is characteristic of the best period of Bath architecture. Messrs. Waring, who are closely interested in the project, have stated their views to a representative of the London "Standard." "The question which has arisen," Mr. Waring is reported as having said, "is one which profoundly interests me from many points of view. As proprietors of the hotel the development of our scheme of extension has been delayed by the agitation which has arisen to spare Bath Street. We have been pained by an unwilling association with proposals which involved the destruction of a piece of architecture which was held in high esteem not only by the citizens of Bath, but by a large and influential body of architects and antiquarians representing the best artistic sentiment of the day. As you are aware, the blame has not been directed at my firm, but at the members of the corporation of Bath for sanctioning the plans, and we were really under no obligation to modify the plans in the least. These plans, of course, gave us the maximum space for extending the hotel by the addition of the largest number and biggest possible rooms, but we felt obliged notwithstanding the loss, to bow to the wave of feeling which has been evoked, at least to the extent of deferring the demolition of the colonnaded houses until the question had been thoroughly debated. The matter, however, has not progressed in the least, so we have gone to an eminent architect, whose name carries great weight in the profession, and he has prepared a design which retains the arcade which is the destinctive feature of Bath Street, and the essential characteristics of the Georgian facade, by means of a coupled colonnade, out of which spring arches supporting the walls of the upper floors of the buildings. The introduction of a double colonnade was necessary to sustain the extra weight of the new superstructure." The architect referred to was Mr. R. Frank Atkinson, F.R.I.B.A.

Looking at the design then produced by Mr. Waring, a feature of which is that extra top light is provided for the new corporation baths, on the ground floor, and comparing it with the elevation which had been submitted and approved by the Bath Council, the "Standard" representative pointed out the loss of space involved in the new plan by the setting back of the top three floors, so as not to interfere with the light to the opposite houses. Mr. Waring said that this meant a loss in the cubic capacity of the block throughout the length of the street, but a more serious consideration was the additional cost of building an arcaded street as compared with the conventional pattern. He was prepared, notwithstanding, to make the sacrifice in both directions in the public interest, provided the corporation would cooperate with him; and in doing this he felt there could no longer be any justification for the charges of vandalism or the imputation that he was on the side of those who cared nothing for the beauty or for the historical associations of the city of Bath.

"Throughout all that has been said and written on the subject," Mr. Waring complained, "not one practical suggestion for treating Bath Street so as to retain its beauty and harmony has been put forward, and it is essentially a matter for the municipality."

The Old Bath Preservation Society contend that the whole plan of Bath Street, with its well-balanced colonnade on either side, should be maintained in its entirety, and that any attempt to mutilate or deface any portion of the unique thoroughfare must be strenuously resisted. It is therefore very doubtful whether the latest suggested solution of the difficulty will be accepted.

Architects of the Day.--V.

Mr. D. H. Burnham, of Chicago.

Daniel Hudson Burnham, probably now the foremost of American architects, was born at Henderson, Jefferson County, New York, September 4th, 1846. Hs is a grandson of Samuel Hopkins, of Vermont, who made himself famous in the war for American Independence. In the year 1855 his family moved to Chicago, which was then a mere border town of a few thousand inhabitants. In the year 1864 he commenced his architectural studies in Massachusetts; and in 1867 returned to Chicago and entered the office of Messrs. Loring and Jenney, where he received his first eighteen months' professional experience. In October, 1871, he was engaged by Messrs. Coster, Drake, and Wright, in the rebuilding of the city which followed the great fire. Those were not days of monumental city planning, and the refinements of life are not the first things to be thought about after a great catastrophe. The buildings first erected were only a stage in advance of those which had been just burned down—the advance was in engineering rather than architecture; the buildings were better designed as regards construction, and perhaps also as to means of escape in case of fire, but it was not until some years later—one might say at least not until after the Centennial Exposition of 1876, held at Philadelphia—that the idea of building beautifully—for effect as well as strength—took hold of the people of Chicago.

In 1873 Mr. Burnham and John Wellborn Root commenced the practice of architecture under the firm name of Burnham and Root. An examination of their very early work reveals only undeveloped—but developing artistic ability, and their later work, such as the "Chicago Herald" building and the Monadonock office building, the twenty-storey Masonic Temple, and the building of the Women's Christian Temperance Union, all of which designs were well in advance of what was being done by their contemporaries, though proving artistic perception in their designers, were all expressed through the medium of a style little suited to the orderly and rather Latin taste of Mr. Burnham. The Monadonock, though a plain commercial structure—absolutely unornamented—attracted much attention on the part of the public and "the profession" alike, because of its good proportions and excellent lines, and may be said to be the first evidence of classic taste in the design of office building structures.

The earliest architectural development of Chicago is centred in the work of these two men, who "laid to" with the optimistic spirit so well expressed in Kipling's lines:—

> "Ye've left a glimmer still to cheer the man
> —the arrtifex!
> *That* holds, in spite o' knock and scale,
> o' friction, waste and slip,
> An' by that light—now mark my word—
> we'll build the Perfect Ship."

MR. DANIEL HUDSON BURNHAM OF CHICAGO.

Mr. Burnham has attained a world-wide renown for his great town-planning work in America, notably in the schemes he has prepared for the cities of Washington, Chicago, and San Francisco.

The beginnings of modern American architecture may be said to have taken place when in September, 1890, Messrs. Burnham and Root were appointed "constructing architects of the Columbian Exposition," and a month later Mr. Burnham was made Chief of Construction. The following January Mr. Root, who had been studying the design while Mr. Burnham was busy organising the construction department, died, and Mr. Burnham was appointed Director of Works, with sole responsibility for the artistic and practical result of the whole work connected with the buildings and grounds. It was due principally, if not entirely, to his efforts during the period of inception, that the arrangement was made to place a Board of Architects in control of the scheme and assign the separate buildings to different architects.

This Board of Architects included most of the conspicuous artistic talent of the day—two of its members, the late Richard Morris Hunt and the late Charles Follen McKim were the only Americans who have ever been presented the Royal Gold Medal of the R.I.B.A.—McKim, with his partners Mead and White, Messrs. Peabody and Sterns, the late Dankmar Adler and Mr. Louis Sullivan, Mr. Geo. B. Post, the late Henry Van Brunt, and Mr. Howe, the late W. L. B. Jenney, Mr. Solon, S. Beman, and the late Charles Bowler Atwood. The last-mentioned was chosen by Mr. Burnham to become his chief assistant, and later taken into partnership. Mr. Ernest Graham, another assistant, renowned for executive ability, was made Assistant Director of Works, and afterwards a partner. In thus drawing about him the ablest and most influential members of his own profession and putting in their hands the check upon his own ideas and undertakings, Mr. Burnham displayed a diplomatic skill for which he has always since been distinguished—not only among architects, but when dealing with the great "captains of industry," "masters of finance," "railway magnates," and able politicians with whom he has been in constant contact since the days when the Exposition was first projected. To an acquaintance he was once described, by a late United States Senator, as "a great artist, a great engineer, a great organiser, and a great diplomat." When this was repeated to an engineer who had worked with Mr. Burnham during the Exposition days, the reply was even more pleasantly interesting: "He has a cold head and a warm heart, which never mix, but are always in touch with each other. In meeting him I always felt a thin sheet of ice was between us, but a generous man on the other side." These are the sort of things one sometimes hears said of a prominent man after his demise—and then usually by his personal friends—but the above comments were made by men who knew Mr. Burnham in business only, to another who they knew had at that time met him but once.

The reason the better characteristics of prominent men are not more frequently mentioned—except, of course, during after-dinner speeches—is doubtless due to fear on the part of their acquaintances of hurting the susceptibilities of the subject. But when that subject is separated from the writer by a distance of about one-quarter round the world, one may put it in its true perspective with sufficient propriety.

The Columbian Exposition brought together not only the best architects, but also sculptors, painters, engineers, "landscape architects," and workers from all over the United States. Perhaps no other Exposition anywhere ever aroused such widespread interest, such sectional pride, or such local enthusiasm. This was a monument to commemorate the four-hundredth anniversary of the discovery of America, a memorial to the peaceful progress of the American people, a milestone marking the course of development of the great "Middle West," the "Coming-out reception of Chicago."

One of the most disastrous conflagrations of modern times had swept the city of

Chicago out of all but existence only twenty-one years before, and its rebuilding had gone on amidst national financial panic, wild struggles with a semi-organised and desperate anarchy, which was insidiously sapping the mind and energy of local labour, and in the face of lack of faith in its enterprises on the part of investors in the Eastern States. Chicago was spoken of as the "city of slaughter-houses," of "pork packers," "the city of magnificent prairies"—alluding to the numerous spaces unbuilt upon—and otherwise generally slurred. But in 1893, when the Columbian Exposition was thrown open to the world, everybody who could journeyed thither, and the real Chicago began to be known. Her enterprise, her ambition—to be larger than London and more beautiful than Paris—her great optimism and her financial solidity, became subjects of world-wide discussion. And to-day in Europe, whenever Chicago is mentioned, the great "World's Fair" becomes a topic of conversation. The immediate influence which the Exposition had upon the architecture of the country is too well known to require more than mention of it here. As the mainspring—we might say—of the effects produced by that Exposition, the name of Burnham is permanently associated with it—with one of the greatest architectural achievements of modern times. It is worthy of note that aside from his mere honorarium, which did not refund his expenses, the Director of Works did not profit financially from any work connected with the Exposition, but devoted his time to the undertaking as though he had been a paid servant of the Exposition Company. When the buildings of the Exposition were completed a public dinner was tendered to the chief architect in New York, given directly to the man whose genius had been the guiding force, and as a grateful recognition of his services. At this dinner were gathered as hosts a notable company of men highest in all the arts. On no occasion previously had a member of the artistic profession been so honoured, publicly, in the United States.

Harvard University recognised the importance of his labours by conferring upon him the honorary degree of Ph.D. The following year he was elected President of the American Institute of Architects, and was re-elected in 1895, and following his second term was elected a Director of the Institute for three years.

The Exposition over, Mr. Burnham returned to his large private practice, already one of America's most distinguished architects. But still greater tasks to perform for his profession and his country awaited him in the not distant future. For a few years continuously, and more or less ever since, he has been obliged to devote himself principally to conducting the architectural work of such commercial undertakings as the Ellicott Square buildings, Buffalo, N.Y., Fisher Building and Great Northern Hotel annex in Chicago, Youngstown (Ohio) Bank, the Illinois Trust Company's Building, Chicago (Fig. 1), the Pennsylvania Railroad Station at Columbus, Ohio, the Marshall Field Retail Stores, the Land Title and Trust Company's buildings at Philadelphia, the Majestic Building at Detroit, the Traction Building at Cincinnati, the Union Trust Building at Pittsburg, the Continental Building at Baltimore, the Mills Building at San Francisco, the "Flat Iron" Building, New York (Fig. 2), the Frick Building and the Pennsylvania Railroad Station at Pittsburg (Fig. 3), the First National Bank of Chicago (Fig. 4), Keith's Theatre and the Wanamaker Stores at Philadelphia, the Real Estate Exchange, Chicago, the Wanamaker Store at New York, the Ford Building at Detroit, the Commercial National Bank at Chicago (Fig. 11), the First National Bank of Pittsburg (Fig. 5), the People's Gas Company Building at Chicago (Fig. 6), and Gimbel Brothers' Store in New York (Fig. 7), the two latter being at present in course of construction. His first columnar design for the Selfridge Building in Oxford Street was perhaps the finest design that has yet been made for a commercial structure, and a subsequent re-study—made after a re-study of the original design had been made by another architect in London—was shown two years ago at the Royal Academy by means of a large beautifully rendered water-colour drawn by Mr. Lawrence Buck, of Chicago (Fig. 8). This has been somewhat modified in execution.

It is probable, however, that with the exception of the bank buildings solely devoted to banking, none of these great commercial structures appeal very strongly to Mr. Burnham's æsthetic sense. His great design for the Field Columbian Museum at Chicago seems to be more to his feeling for architecture. It may be classed with the New York and Boston Public Libraries among the very best of American architectural productions. Another work almost as fine and equally important is the great Union Station at Washington, D.C. (illustrated in our issue for September 9, 1908), which arose out of Mr. Burnham's action as a patriotic American citizen in asking a railroad company to give up certain of its rights in the interests of the beauty of the nation's capital, in the planning of which Mr. Burnham has taken a part second only to Major L'Enfant, who made the original plan.

Plan of Washington.

In March, 1901, the Senate of the United States "Resolved that the Committee on the District of Columbia be, and it is hereby, directed to consider the subject and report to the Senate plans for the development and improvement of the entire park system of the District of Columbia. For the purpose of preparing such plans, the Committee may sit during recess of Congress, and may secure the services of such experts as may be found necessary for a proper consideration of the subject," etc.

About a fortnight later the sub-committee having the matter in charge met the representatives of the American Institute of Architects and agreed to the proposition of the latter that Mr. Burnham and Mr. F. L. Olmstead, jun., be employed as experts, with power to add to their number. These gentlemen accepted the task, and subsequently invited Mr. McKim and Augustus St. Gaudens to act with them. Mr. Burnham was elected Chairman of this Expert Committee.

At the call of their professional brethren, and at the request of this committee, these men virtually put aside their large and profitable private work, and for nearly a year devoted their time, their experience, and their technical training to the service of the nation. These sacrifices were made without pecuniary reward, and at a time when success and fame were already secure.

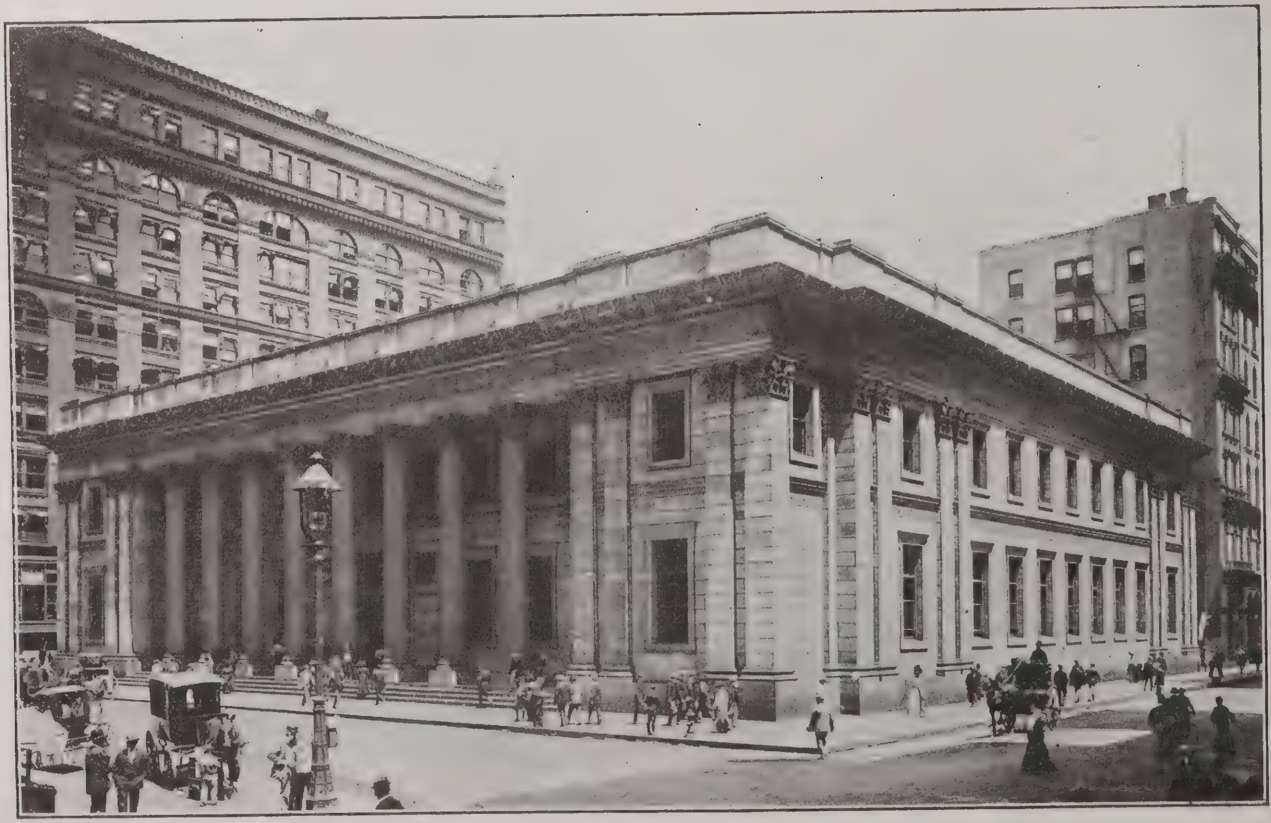


FIG. I.—THE ILLINOIS TRUST COMPANY'S BUILDING, CHICAGO. D. H. BURNHAM AND CO., ARCHITECTS.

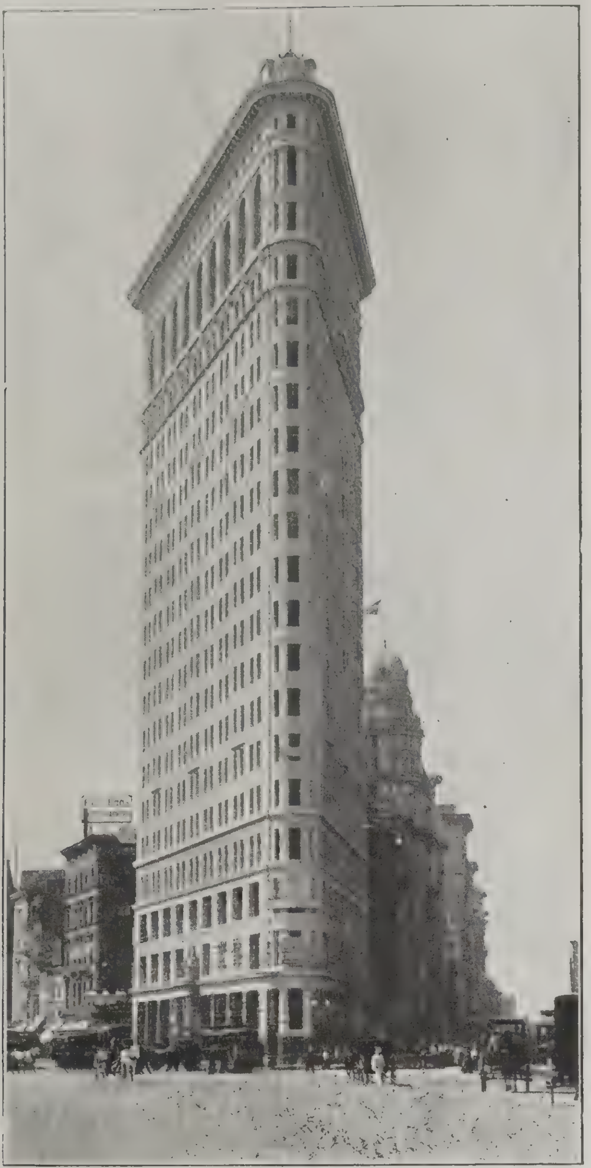


FIG. 2.—THE "FLAT-IRON" BUILDING NEW YORK. D. H. BURNHAM AND CO., ARCHITECTS

The work done by this committee resulted in the adoption of a plan following closely the original plan made by Major Pierre Charles L'Enfant in 1791, its object being to prepare for the City of Washington such a plan as should enable future development to proceed along the lines originally planned—namely, the treatment of the city as a work of civic art—and to develop the outlying parks as portions of a single well-considered system.

After detailed examination of the topographical features of the District of Columbia, the Commission drew up preliminary plans. They were then forced to the conclusion that an adequate treatment of the park system depended upon the exclusion of the Baltimore and Potomac Railroad from public grounds, so as to allow that dignified approach to the Capitol for which the Mall was originally designed. The occupation of the Mall by the railroad dated back to 1872, when it was granted by the then local government of the District of Columbia and confirmed by Congress. The railroad therefore held the right to use the property by a title good in law and equity, and by virtue of a later Act of Congress the railroad space had been enlarged in consideration of the surrender of street trackage and the proposed elevation of tracks in the City of Washington.

Mr. Burnham was architect of the Pennsylvania Railroad's new station at Pittsburg, and he had also drawn for the Pennsylvania Railroad the preliminary plans for the then proposed new Baltimore and Potomac station in the Mall site. He went to the President of the Pennsylvania and asked that the station be built on the south side of the Mall and lands adjoining. The architectural and other advantages of the proposed site were set forth with such vigour as to command serious consideration.

During the summer (1901), Mr. Burnham, with other members of the Commission, made a brief trip to Europe, and while here—in London—President Cassatt, of the Pennsylvania, announced to him his willingness to consider the question, not of moving the station to the south side of the Mall, but of withdrawing altogether from that region and uniting with the Baltimore and Ohio Railroad Company in the erection of a Union Station, provided suitable legislation were secured to make compensation for the increased expense such a change would involve, and provided, also, that the approaches to the new site be made worthy of the building the railroads proposed to erect.

The Commission proposed a site on Massachusetts Avenue, which was finally accepted by the railroad companies. Mr. Burnham was charged with the designing of the new station, which was intended to be superior to any structure ever erected for railway purposes.

It is seldom, even in these days of town planning—or talk of it!—for an architect to be charged with the planning of a city, but to have planned two or three capital cities surely must be a record. Such, however, has fallen to the lot of the subject of this article.

The Plan of Manila, Philippine Islands.

In 1898 differences between the United States and Spain resulted in the acquisition of the Philippine Islands by the former. No sooner had these islands come into the possession of the United States than the War Department set about adapting the capital city of Manila to the changed conditions brought about by the influx of Americans who are accustomed to better conditions of living than had prevailed in the Philippines. In 1905 Mr. Burnham, assisted by Mr. Pierce Anderson, was instructed by the Secretary of War (the Honourable William H. Taft, now President of the United States) to visit the city of Manila and prepare a report and plans for the future improvement of the city and harbour. The report was completed on June 28th, 1905. It deals briefly with the history and general conditions prevailing, political, topographical, building, and population. It was accompanied by two plans—the plan of Manila, showing proposed improvements, and plan of Manila Bay, showing a proposed sea boulevard.

The aim of the proposed plan is stated to provide:—

(1) Development of water front and location of parks and parkways, so as to give proper means of recreation to every quarter of the city.

(2) The street system, securing direct and easy communication from every part of the city to every other part.

(3) Location of building sites for various activities.

(4) Development of waterways for transportation.

(5) Summer resorts.

The proposed development of the water front includes the construction of an ocean boulevard or continuous parkway along the bay to the south side of the city; planted drives along the shores of the river, which runs, approximately, east and west, and divides the city into halves; a new Luneta—or island pleasure park—formed upon made ground in the shallow part of the harbour, parks, parkways, playgrounds, gardens, and fountains.

The street system deals with the sanitation of the old quarter, and attempts to connect it with the ideal plan proposed for the future extension of the city that the existing streets, bridges and harbour works may be left substantially unchanged, and no demolition of buildings or changes in the direction of streets are suggested, except such as were imperatively called for to relieve present congestion and provide for the future needs of traffic. It also considers carefully the advantages and disadvantages connected with the old city walls, and recommends their retention, suggesting the cutting of arches through same to allow the extension of streets. It also proposes that the old moat shall be filled in, and treats scientifically the problem of the width of streets. Of the street system in the new quarter, it provides:

Avoidance of either north or south or east and west orientation of building sites.

Fan-shaped grouping of radiating streets.

Diagonal arteries allowing direct communication from any city district to any other.

The avoiding of north and south, or east and west orientation of streets allows each of the four sides of the house to have the advantage of direct sunlight at some time during the day, with consequent gain in ventilation and sanitation.

The location of building sites for various activities is discussed in the report in groups consisting of the Government or National group, the Court House or Halls of Justice, the group comprising the Library, Museum, and Exposition buildings (which might be

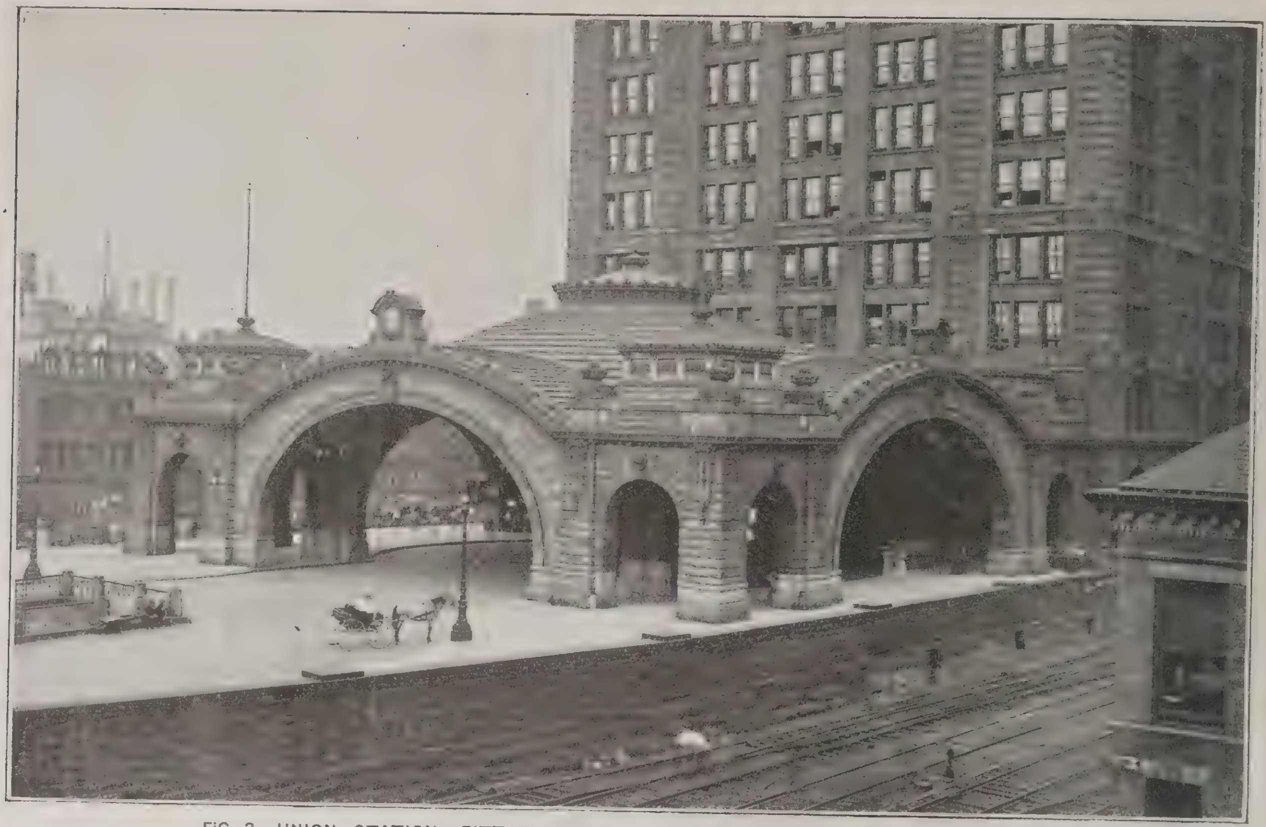


FIG. 3.—UNION STATION, PITTSBURG, PA. D. H. BURNHAM AND CO., ARCHITECTS.

termed the group of Public Instruction), the Post Office, the Railway Station and approaches, the Municipal group, the official Residences, the hotels, the Casino, public baths, and boat clubs (public recreation), the school centres, and the charitable institutions. The Development of Water Transportation considers additional harbour facilities, *esteros*—narrow canals—ramifying throughout Manila, and the establishment of open quays along the riverside.

The climate of Manila made it necessary to give special consideration to the subject of establishing accessible summer resorts on high ground, and led to the interesting study of the suburban districts.

Not the least interesting point in connection with this report was the recommendation that buildings should be constructed of reinforced concrete for the purpose of resisting earthquake shocks.

Plan of Bagnio, the Summer Capital of the Philippine Islands.

The necessity of providing for a summer capital for the government of the Philippines led to the creation on the hills of Bagnio, about one hundred miles from Manila, of a city laid out on a plan similar to that made by L'Enfant for the city of Washington, in that it provides for such public buildings as may be needed for Government offices, for the service of the city itself, and for the healthfulness, convenience, and recreation of the people, and all these functions are so arranged as to make a unified and orderly city.

Plan of San Francisco.

This brilliant monumental study in town planning was made by Mr. Burnham, assisted by Mr. Edward H. Bennett, in the year 1904, for the Association for the Improvement and adornment of San Francisco. Unlike Washington, Manila, and Bagnio, San Francisco is not a capital city, but a great seaport commercial town. It is consequently less monumental, and possesses fewer centres of interest than those cities. The plan prepared by Messrs. Burnham and Bennett is remarkable, principally as showing how it would be possible to convert the inconvenient and uninteresting plan of San Francisco into one that would be both convenient and beautiful by cutting a few diagonal avenues and widening a few streets. The increment in property value throughout the city alone would well justify the necessary expenditure for nearly all the work proposed. The sketches were most interesting, and the treatment of focal centres, as Telegraph Hill (Fig. 10), and the Athenæum looking to the sea (Fig. 11), are most valuable compositions and suggestions. The charming and domestic side of the design was suggested by the treatment for existing street frontages, and the strength of the planner was apparent in the plan of the new centre for the city.

The Plan of Chicago.

The Columbian Exposition of 1893 was the beginning in our days and in the United States of the orderly arrangement of extensive public grounds and buildings. It stamped itself indelibly upon the memories of all who saw it, and it continued to live in the memory of the people and dwell upon the minds of the architects who had created it. To the people of Chicago it called for some permanent memorial of itself. It suggested the improvement of the water front of Chicago. The year following the Exposition, the Park Commissioners proposed the improvement of the lake front from the site of the Exposition—Jackson Park—to Grant Park, a distance of about seven miles. A plan was prepared for the Commissioners, and subsequently exhibited at a dinner given by the Commercial Club. Many of the business men who were present at this gathering were emphatic in expressing their conviction that the scheme would be of the greatest value to Chicago and should be adopted and carried into execution. This was the inception of the project for a park out in the lake, having a lagoon between it and the shore, and for several years Mr. Burnham and his assistants worked along developing the design.

In 1906 the Merchants' Club arranged for the preparation of a complete project for the future development of Chicago. The following year this club merged with the Commercial Club under the name of the latter, and the work has continued under the auspices of that association. As proving the intensity of interest in this plan, it must be noted that the committee met several hundred times during the progress of the work; during many weeks meetings took place daily, and throughout the entire time no week passed without at least one meeting.

In perparing this enormous design the Commercial Club undertook the following task:—

In preparing this enormous design the physical conditions of Chicago as they now exist.

Second, to discover how those conditions may be improved.

Third, to record such conclusions in the shape of drawings and texts which shall become a guide for the future development of Chicago.

It is quite impossible to go into even the most general details of a project so vast as this. If the idea were proposed for any other city on earth it might be put down as a most extravagant dream. But with Chicago nothing is impossible. Anything that is really worth doing is probable of execution. The people of Chicago are so accustomed to results beyond their most sanguine predictions that they hope easily, believe easily, and accomplish easily. They are a people trained in intense commercial activity, who understand that great success cannot be attained unless the special work in hand be entrusted to those best fitted to undertake it. It is the habit of Chicago's business men to select some one to take the responsibility in every important enterprise, and to give to that person earnest, loyal, and steadfast support. In the preparation of this plan, which is perhaps the most gigantic work ever placed in the hands of an architect, Mr. Burnham was selected to take the principal responsibility. The plan, which as a scientific and artistic treatment of the city as a whole is unrivalled by that of any existing city in the world, is now complete, and with the many beautiful drawings of details, has been published this year in a magnificent quarto volume by the Commercial Club of Chicago. The conception of this plan of itself—had he done nothing else—is enough to give to its author a permanent place among the greatest architects of his or any other century. We have, however, an abundance of monumental works by him which might be regarded as details of this plan, and anyone of these "details" would be sufficient to make a reputation for most architects.

In the above notes it has been attempted to gather together in brief review the more important works of this architect; more than that it is impracticable to do in these pages—it is impossible in an article as short as this to do so much as even give a list of the numerous houses, many of which are remarkable for charm and dignity, or of the gardens, park shelters, small club-houses, etc., built from his designs; nor to mention more than the best known of his many good deeds done in behalf of his art, his confrères, and of the younger men. It is almost needless to recall his famous letter to the secretary of the Treasury—Carlisle—during the period of his Presidency of the American Institute of Architects, or the importance of his influence in bringing about reforms in the office of the Supervising Architect of the United States Treasury Department, and placing a competent architect in charge of the designing of the smaller post offices, custom houses, etc.

Two things which he has done are, however, especially worthy of note and grateful remembrance: First, by his fellow citizens, as regards the important duties he has performed, *as a citizen*, in giving gratuitously his time and thought to the planning of cities in order that posterity may enjoy advantages beyond those of the present generation—a labour which somebody ought to perform for nearly every city, and a task which Mr. Burnham has undertaken in the instances mentioned. Second, by good sportsmen, the world over, who love fair play in all things, and by that numerous band of men who are to be classed with,

"Full many a gem of purest ray serene," whose worth is never generally known, but who can applaud the breadth of character in a man who brings to light some of their number by sharing the credit for his work with those of his subordinate co-workers who are his principal assistants upon a given work. It is due to this generous trait that the "and Co." ordinarily appears after Mr. Burnham's name. It is, therefore, in a sense not a commercial title, and is due honour as well as respect, in this unique case—it relieves the necessity of an explanation of the association, upon a design, of a number of artists and engineers, most of whom are in his employ, but whose identity he chooses to reveal rather than conceal, and whose names he has coupled with his own. He is always the real designer of the work which bears his name; and except in those instances when the name of the assistant is fully acknowledged, may be always safely regarded as the sole architect.

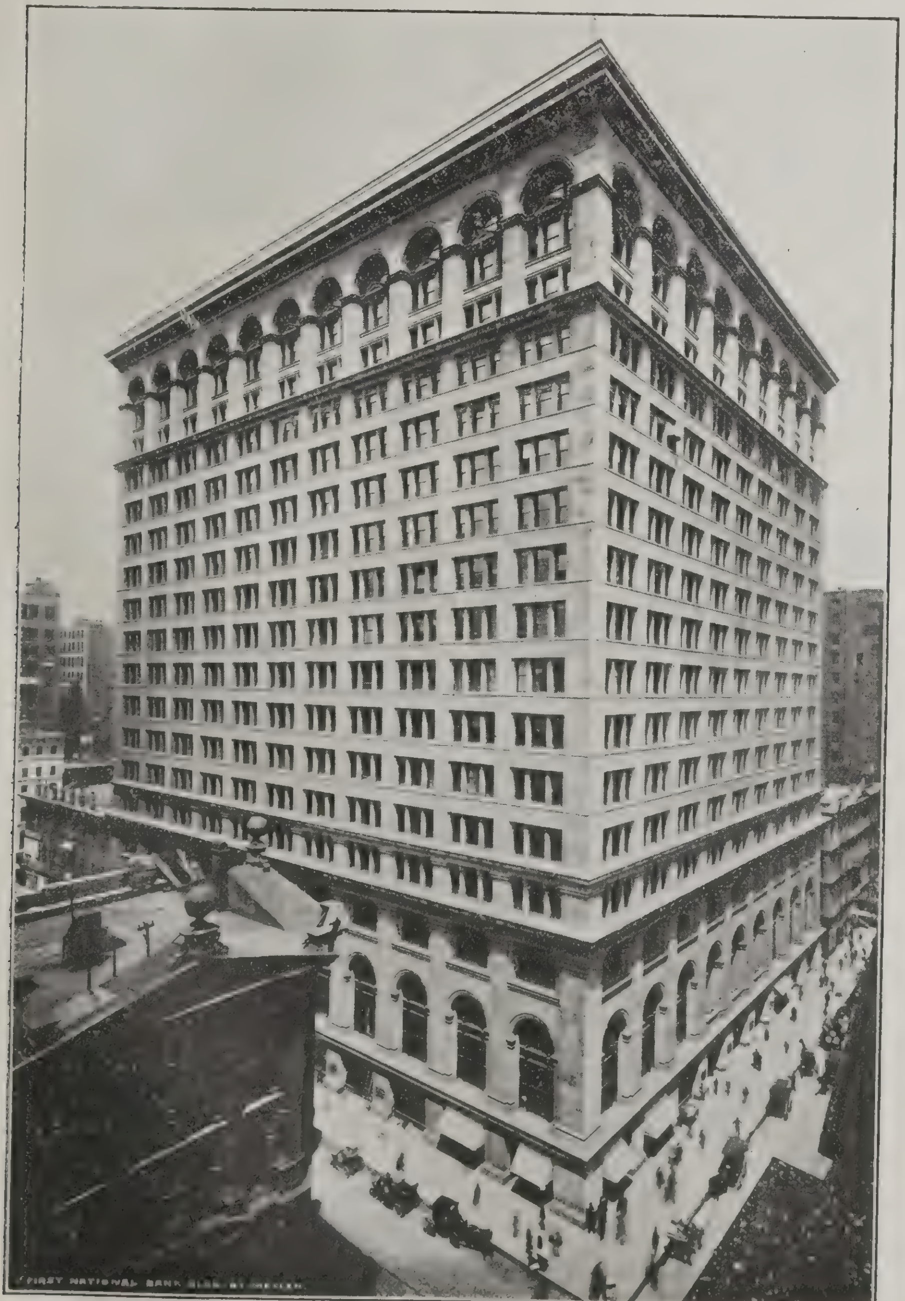


FIG. 4.—FIRST NATIONAL BANK, CHICAGO.

SOME PRINCIPLES OF RESTORATION.

Since, whenever a cathedral is restored, protests and controversies are sure to arise, it may be worth while, says the writer of a leading article in the "Times," to consider what principles ought to be followed in the restoration or repair of ancient buildings. The first and the most frequently ignored is this, that any copy of a fine old building or of any expressive part of it is sure to be a dull absurdity. A great Gothic Cathedral is a work of art, just like a great picture or statue, and a work of art produced in conditions and expressing a state of mind which now no longer exists. It was produced, of course not by one man, but by many; but that fact makes it no easier to imitate. Gothic architecture was a growth, not a game, and an imitation Gothic building is as little like a real one as an imitation tree is like a real one; that is to say, it has a superficial resemblance, but lacks all the qualities which make the original beautiful and interesting. This is not mere theorizing, it is a fact proved by all the imitation Gothic buildings and all the purely imitative restorations which have been produced since Horace Walpole first started the Gothic revival with his ugly toy at Strawberry Hill. Nothing proves it more thoroughly than the imitation Gothic sculpture and stained-glass windows with which so many cathedrals both in England and France have been defaced. The windows are more fiercely ugly than the sculpture; but both have the inevitable dulness of imitation so close that it implies a complete lack of inspiration.

The objection to this kind of restoration is not that it is modern, as many people suppose. Every great work of art is modern when it is produced; and no doubt the greatest look their best when they are new and just what the artists meant them to be. The objection is that these imitations are neither modern nor ancient. They have not the character of any age or the stamp of any individuality. The extreme opponents of restoration seem to hold that we have no right to touch a cathedral except to prevent it from tumbling down. But that view implies an utter despair of all modern art, and it is not a view that has been held in any age of living art. The builders of each successive age of Gothic architecture were quite ready to take liberties with the work of their predecessors. But they were not ready to imitate that work so soon as it belonged to the past. Nor were they afraid of any incongruity between the past and the present. Even when Gothic architecture was superseded by the Renaissance, the Renaissance architects continued to make additions to Gothic churches, and many of these can only look incongruous to a pedantic eye. What does look incongruous is the mixture of imitative with original work, and this is an incongruity which has been reserved for the timid purism of modern times. Perhaps the best we can do, where the fronts and porches of our cathedrals lack their original sculpture or only keep a few broken and battered remains of it, is to leave them alone and to make only such structural repairs as are absolutely necessary. The next best is to supply them with sculpture designed entirely by living artists, and without any attempt to imitate old work. Such sculpture has at least the chance of being expressive. But the sculpture which has no aim except to avoid incongruity is sure to have the worst incongruity of all—the incongruity of death compared with life. It is the same with all ornament that is a mere joyless imitation of originals that were produced with joy and conviction. With these dicta of the "Times" writer few architects will disagree.

The architects of Westminster Cathedral are at present engaged on the design of a mosaic of Joan of Arc, which is the outcome of an idea originated by the Catholic Women's League.

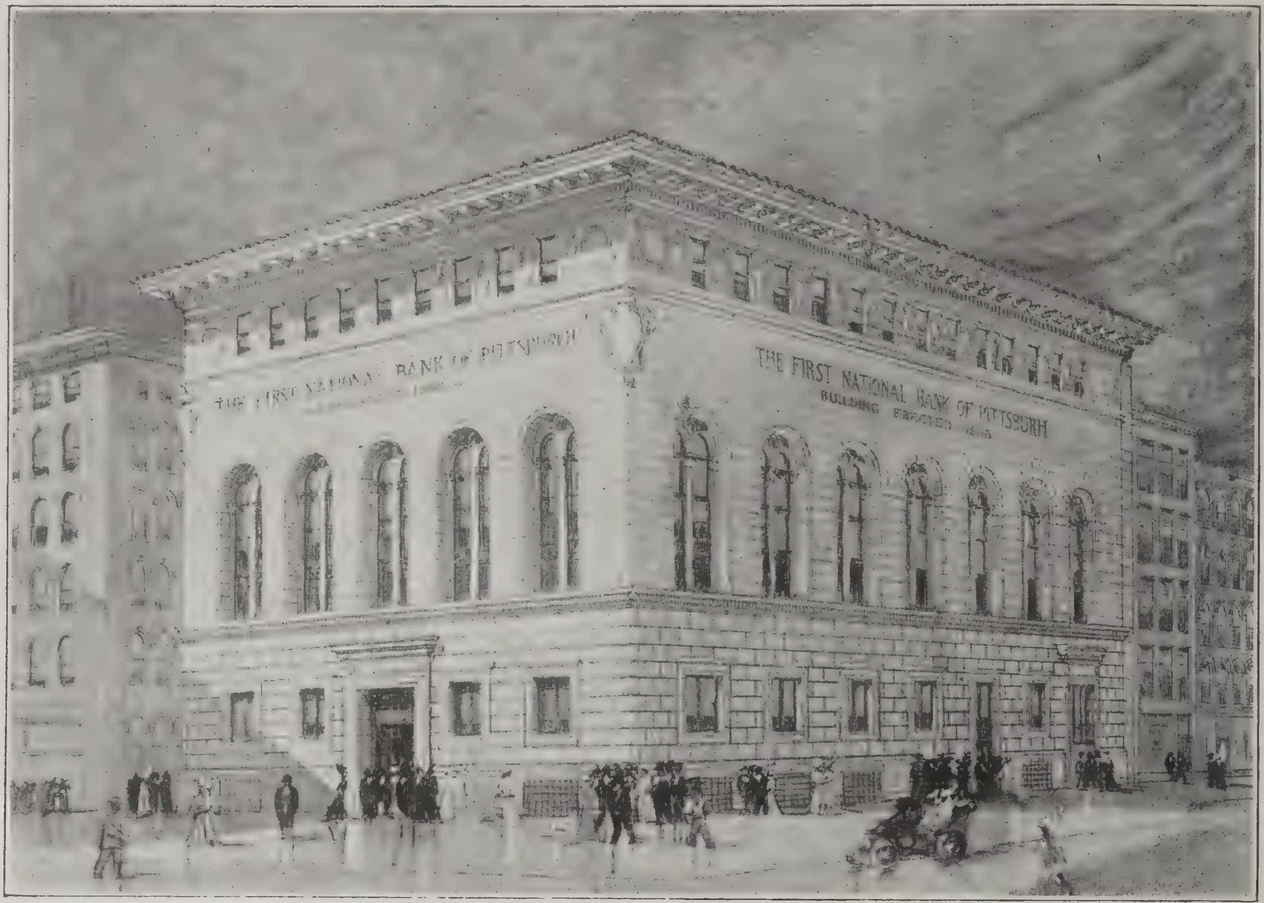

THE FIRST NATIONAL BANK OF PITTSBURGH
THE FIRST NATIONAL BANK OF PITTSBURGH
BUILDING ERECTED

FIG. 5.—THE FIRST NATIONAL BANK OF PITTSBURG. D. H. BURNHAM & CO., ARCHITECTS.

Societies and Institutions.

University of London.

An Appointments Board has been constituted by the University of London. The terms of reference to the Board are "to assist graduates and students of the University in obtaining appointments, and to coordinate and supplement the work done by the schools and institutions of the University with this object." It is hoped that, through the medium of the Press, the objects of the Board may be brought to the notice of graduates as well as of those who are able and willing to assist in furthering the work of the Board, the aim of which is to encourage the selection of University men for all posts in the work of which the possession of a University training on scientific methods is an advantage. They wish to assist graduates to find employment, and to assist employers to find, in the University ranks, suitable men for vacancies. It would assist the Board if, whenever readers know of any vacant appointments suitable for University men, they would communicate with the Secretary of the Board, so that he may put forward selected candidates. In this way the work of the Board as an employment exchange would be greatly helped.

University Extension Guild Lectures on Architecture.

Mr. Banister Fletcher, F.R.I.B.A., commenced a course of 24 University Extension lectures on "Ancient Architecture," at the British Museum, by permission of the trustees, on Tuesday, October 5th. The lectures will deal with Egyptian, Assyrian, Persian, Greek, Roman, Early Christian, and Byzantine Architecture, and will be fully illustrated with lantern slides and photographs. The objects in the Museum will be explained in the class held after the lecture. The course is continued every Tuesday afternoon, at 4.30.

Sheffield Society of Architects and Surveyors.

The twenty-second annual report has been issued of the Sheffield Society of Architects and Surveyors, which was founded in 1886, and was in 1889 the first provincial society to avail itself of the scheme of alliance with the Royal Institute of British Architects. The meetings of the society are held at the University, Western Bank, and its library is placed in the room allocated to the Department of Architecture at the university. During the twelvemonth dealt with in the report, one hon. member, one fellow, and nine students were elected, and three associates, one student, and one lay member having resigned, the membership now stands as follows: Honorary members, two; fellows, thirty-nine; associates, fifty-one; students, twenty; lay members, seventeen; total, 129, as compared with 123 for the previous year. During the session, several members of the council were invited to join a committee appointed by the Chamber of Commerce to consider the new building by-laws and regulations.

Society of Engineers.

The fourth vacation visit of the present session took place on Wednesday, September 22nd, when, by the courtesy of Messrs. Wm. Hill and Son, facilities were given for a party of members of the Society and their friends to inspect the organ building works of that firm at Camden Road, Islington, N. Wm. Hill and Son are the oldest firm of organ builders in this country, being descended from John Snetzler, whose business, founded in 1755, passed into the possession of Thomas Eliot, and then to his son-in-law, William Hill, the distinguished organ builder, in the earlier part of the nineteenth century. For nearly a hundred years, therefore, the business has been in the Hill family. Many of the principal organs in the United Kingdom and the Colonies have been built by the Hills, including some of the most celebrated instruments in the cathedral and parish churches of the country, besides those in secular buildings. The present works in York Road, built in 1873, consist of offices, a large hall, 80ft. by 40ft. (in which the organs are erected after the different parts have been prepared), and an engineering shop where, in addition to the ordinary work connected with organ building, the firm make their own hydraulic engines for organ blowing. Outside the workshops is an extensive timber yard, where a large stock of hard and soft woods is stacked and kept to mature. The machinery connected with the works is driven by a 30-h.p. gas engine.

Northampton Polytechnic Institute.

The new building of this Institute, which was in process of erection at this time last year, has since been finished, and is now available for the extending work of the Institute. It provides a much needed enlargement of the mechanical engineering workshop and of the mechanical laboratory, besides two entirely new power laboratories. This increased accommodation will materially assist the work of the mechanical engineering department, as already established, as well as the new departure in the direction of aeronautical engineering, which is being made in the coming session. In addition to the above, the extension provides a new classroom capable of accommodating 280 students and 13 other class-rooms of various sizes for the numerous classes of the Institute in all departments. Besides the new classes in aeronautical engineering in the mechanical engineering department, there will be in the electrical engineering department a new class on the testing of electrical plant conducted by Dr. C. V. Drysdale, in place of the advanced class on electrical instruments, which will not be held this session. There will also be a new class on electrical engineering quantities and estimates, conducted by Mr. E. Kilburn Scott. Developments in various directions have been made or are in contemplation.

Municipal School of Art, Birmingham.

The programme for session 1909-10 of the Central School of the Birmingham Municipal School of Art includes particulars of the Day School of Architecture, of which the object is "to provide architectural students in the Midlands with a thorough training in all the branches of their profession, and to prepare them for the examination of the Royal Institute of British Architects." The school course extends over four or five years. The first two years are spent at day classes, and are intended to take the place of the first two years of articled pupilage. The latter two or three years are spent at evening classes, and run concurrently with articled pupilage. The teaching staff is as follows: General director, J. L. Ball; assistant director and lecturer in design, E. F. Reynolds (Soane Medallist, 1903); lecturer in history, W. H. Bidlake, M.A., A.R.I.B.A. (Pugin Scholar, 1885); lecturer in physics, etc., F. B. Andrews, A.R.I.B.A.; assistant, John B. Surman, A.R.I.B.A.

Glasgow and West of Scotland Technical College.

The Calendar for the one hundred and fourteenth session (1909-10) of the Glasgow and West of Scotland Technical College includes, very prominently, architectural and building interests, there being special committees on architecture, on new buildings, and on plumbing classes, besides the joint-committee on the Glasgow School of Architecture. In the School of Architecture, the director of architectural studies and professor of architectural design is Mr. Eugene Bourdon, B.A. This school comprises the Technical College and the School of Art, in the former of which there are classes in the history of architecture, on constructive and historical design, and mathematical and other sciences; while in the latter there are classes in architectural design, and in drawing, modelling, and decorating. Professor Charles Gourlay, B.Sc., A.R.I.B.A., is at the head of the department of architecture and building construction, in which both day and evening courses are conducted; Mr. James S. Boyd being lecturer and assistant. There are also courses in carpentry and joinery, masonry, brickwork, quantity surveying, decoration, modelling in clay and wood carving, and perspective. The Calendar, which is a substantial volume of about 500 pages, is published by Robert Anderson, 142, West Nile Street, Glasgow.

Institution of Municipal Engineers.

At a meeting of the Council of the Institution, held at 39, Victoria Street, Westminster, on September 22nd, 12 applications for membership and seven for studentship were considered. Of the former, nine were accepted, of the latter six. The roll of the Institution now stands at 612 members, and 82 students, making a total of 694. A design for student's certificate was approved, and the secretary was instructed to put the matter in hand. It was decided that three Council meetings during the present financial year should be held on Saturdays at 2 o'clock. Notice of the following motion was given: "That the existing classification of members be reconsidered on a wider basis."

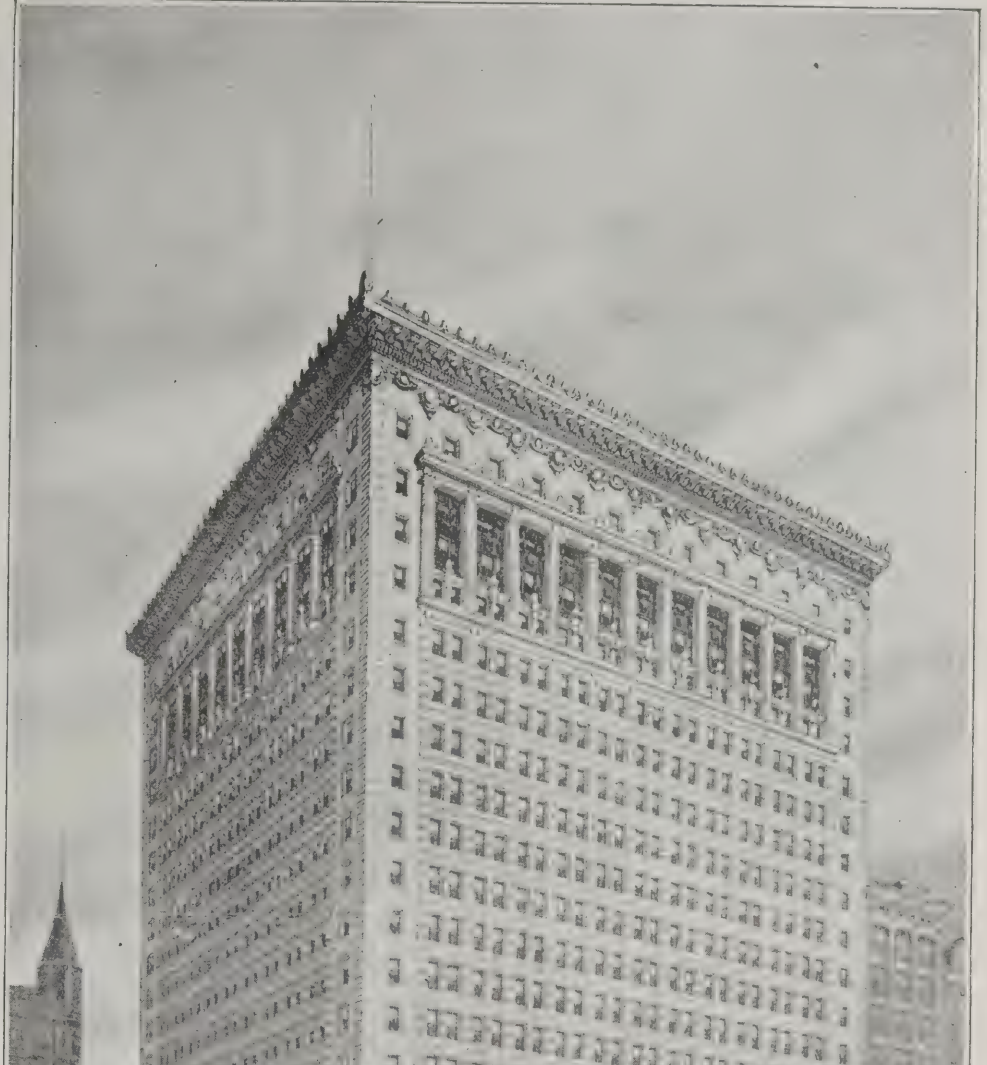


FIG 6 THE PEOPLES' GAS COMPANY BUILDING, CHICAGO. D. H. BURNHAM & CO., ARCHITECTS.

R.I.B.A. Examinations, Autumn, 1909.

The examinations will be held as follows: The Preliminary Examination, qualifying for registration as Probationer R.I.B.A., is to take place on November 8th and 9th. The Intermediate Examination, qualifying for registration of Student R.I.B.A., on November 8th, 9th, 11th, and 12th. Further, the Institute's Final and Special Examinations, qualifying for candidature as Associate R.I.B.A., from November 18th to 26th inclusive. Applications must be sent in on or before Saturday, October 9th. The Testimonies of Study, etc., with the necessary fees, must accompany the applications, and be addressed to the Secretary R.I.B.A., at the Offices of the Institute. Examinations qualifying for the office of District Surveyor in London (pursuant to the provisions of the London Building Act 57 and 58 Vict. c. ccxiii. s. 140), and of Building Surveyor under Local Authorities will be held by the Royal Institute on October 14th and 15th, 1909. All applications must be made on the official forms, to be obtained from the Secretary R.I.B.A.

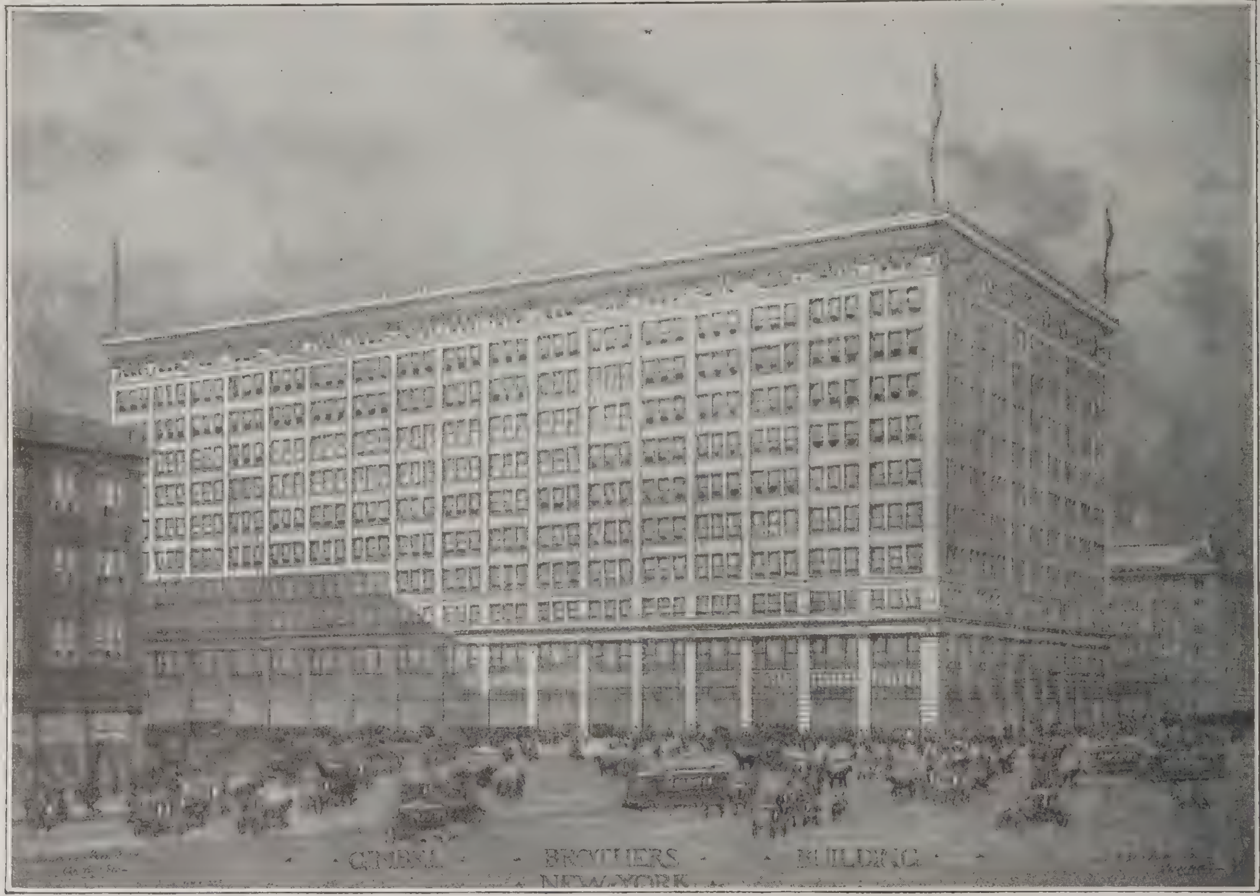


FIG. 7.—GIMBEL BROTHERS BUILDING, NEW YORK. D. H. BURNHAM AND CO., ARCHITECTS.

In Parliament.

By our Gallery Representative.

THE TAX ON "MINERAL" MATERIALS.

GOVERNMENT CONCESSIONS.

In the House of Commons on September 28th and 29th, considerable discussion took place on the question whether clay, chalk, and stone were fit subjects of taxation under the mineral duty clauses of the Finance Bill.

Mr. F. Newdegate proposed to exclude minerals of a less value than 4s. per ton. He sought to exempt from the tax gravel, sand, rough stone, granite used in road making, chalk, refuse banks at collieries, road metal, common clay, and so on. He complained that the Government had been asked for a definition of minerals, and the Committee had never received a straightforward answer. He understood that the tax would fall on sand for brickmaking. A short time ago he sold a bit of land to a building syndicate, and part of the stipulation was that they should have the right to work the sand in connection with that piece of building land. It surely could not be the case that the Chancellor of the Exchequer would expect those people who had bought the land to pay mineral duty, or that he (Mr. Newdegate) as vendor should pay increment duty or other duties in connection with it. There was a quantity of rough stone about the country of no great value, and it was used for building houses. That might come under the definition of minerals, and the owner of the stone might be taxed. Pit heaps were often used for making a common sort of brick, and it would be an absurdity to charge such pit heaps. Road metal cost at the quarry banks about 1s. 6d. per ton, and surely it was not the Government's intention to increase the cost of road metal at a time when they were talking of developing roads throughout the country. In the same way it would not be to the benefit of the community to tax chalk. As to common clay there was a strong feeling throughout the country, and brickmakers felt that they could not stand more taxation. He had had a letter from a brickmakers' association protesting against common clay being subject to the tax on minerals, and the Chancellor of the Exchequer had received a deputation on the subject.

The Chancellor of the Exchequer, interposing, said he had stated the other night that brick clay would be exempt.

Mr. Newdegate said that in any case he was very glad that owing to the representations made to the Chancellor of the Exchequer common sense had been instilled into the brains of those responsible for the Bill. He hoped the other minerals he had spoken of would be taken out of the Bill.

Mr. Balfour protested against the action of the Government in not letting the Committee know what they considered was included in the word "minerals."

Mr. G. H. Lamb wished the exemption to apply to brick clay, brick earth, sand, gravel, and epecially chalk. Chalk was essential to the existence of the cement industry of this country, and it was known that the cement industry was working on a very narrow margin. The Committee ought to bear in mind that this taxation on chalk would be a very small contribution to the Exchequer, and it would mean all the difference between success and failure in many of the cement works of this country.

The Chancellor of the Exchequer said that the Attorney-General had already told the House that the Government had considerable doubt as to the advisability of including clay. The difference between a tax on clay and chalk and a tax on coal was merely a question of administration. It was a question of the revenue which was to be raised—a question whether it was worth all the trouble and inconvenience and cost to the taxpayer in view of the amount of money the Exchequer received. It had been urged upon him from both sides of the House that a tax on clay and chalk would harass certain industries, and would not produce much revenue, and that they ought to be exempted There was a precedent for that, and it was a Conservative precedent, namely, the Irish Land Act. It was a precedent where, after a general statement that all minerals were subject to certain conditions, stones, clay, gravel, and sand were excluded. There was a great deal to be said for that, and when they came to the amendment later on he would be prepared to give favourable consideration to all of them. He would consider them from the point of view that it was not worth while to go to the expense and trouble of collecting the small sums which would be available in those cases. It was a value created by the labour and expense put into it. It was not like coal, which was a valuable mineral.

Mr. Lane Fox suggested lime as being different from coal.

The Chancellor of the Exchequer: I should say that lime and chalk would be pretty much in the same category, but I would like time to consider that point.

Mr. Newdegate mentioned stone.

The Chancellor of the Exchequer said that was a totally different thing. They might have ordinary common stone of no value except the value which labour put upon it, but they might also have very valuable granite. He would have to consider the point. Valuable granite was really a mineral in the essential sense of the word, but when they came to the cheaper substances he thought a good case had been made for the exemption of sand, chalk, and common brick clay. It was possible to draw some distinction in the case of clay, certain qualities of which were valuable minerals, such as china clay and fire clay. If it was possible to draw a distinction between common stone for roads and the more valuable stone, he was prepared to consider it.

Mr. Bonar Law pointed out that the Chancellor of the Exchequer had argued that the tax on royalties could not reach the industry, but would be paid by the royalty owner, yet here he was making exemptions because the tax would reach the building trade.

Mr. R. Whitehead was grateful for the concession of the Government.

Earl Winterton remarked that if the exemption had not been made scarcely a farmer would have escaped the taxation, because on nearly every farm there were chalk, flint, gravel, and clay which was taken and worked. It was stretching a point to say that they were grateful to the Chancellor of the Exchequer. He did not know why the concession was not made months ago, as the proposals of the Budget had had a serious effect on the building industry and the brickmaking industry.

Mr. Scott Dickson urged that Scotch granite should be exempted from the tax.

Mr. Markham declared that in some cases the royalty on clay amounted to 8d. and 9d. per ton, and he did not see why the owners of such royalties should escape. In the town of Mansfield and adjoining towns there were sand quarries where the sand sold for a great deal more than the coal, and in some cases the owners got enormous royalties. He regretted that the Government had given way.

Mr. L. Hardy suggested the exemption of marl.

At a later stage the Attorney-General moved an amendment exempting from the mineral rights duty common brick clay, common brick earth or sand, chalk, limestone, or gravel.

Mr. Pretyman moved to include in the exemption granite, building stone, or road stone. He thought that if limestone were exempted so also should be building stone.

The Chancellor of the Exchequer said they must draw a rough line somewhere. Granite was a very valuable mineral, and the tax upon it did not interfere with industry. The people who received the royalty had nothing to do with the industry except to share the profits. In the case of chalk it was the people who put their money into the development who owned the royalties as a rule. He did not think it possible to draw a distinction between road stone and granite and those other stones. The Government had gone very far to meet the case of road stone, and it was not possible to go any further, though he would consider the matter.

Mr. Pretyman then withdrew his amendment, and the exemption from the tax of common brick clay, common brick earth or sand, chalk, limestone, or gravel was agreed to.

Works in Progress and Completed.

ABERGAVENNY.—Extensions are to be carried out at Holy Trinity Church, Abergavenny, and plans have been prepared by Mr. E. A. Johnson, architect. These provide for the erection of a north aisle to correspond with the south aisle, and a vestry. The estimated cost of the work is £1,250. Messrs. J. G. Thomas and Sons, builders, of Abergavenny, commenced the extensions in July, and it is expected that the work will be completed by the end of the year.

ABERYSTWYTH.—The new premises of the London and Midland Bank have just been completed. The building is Georgian in style, and is the design of Messrs. Woodfall and Eccles, Castle Street, Liverpool. The builder was Mr. Peter Edwards, of Dodleston, Chester.

ANDSELL.—The institute and public hall which have been erected here are the design of Mr. G. H. Willoughby, F.R.I.B.A., of Manchester and St. Annes, the estimated cost being £5,000. The planning of the building provided for two complete sections, a public hall and an institute. The former is 75ft. by 34ft., with seating accommodation for 400 people, artistes' retiring-rooms, catering-rooms, and cloakrooms. In the institute portion three large class-rooms, divided by folding partitions, have been obtained on the lower level, and on the main floor provision has been made for a large reading-room, a library and billiard-room. The architecture is a simple rendering of Elizabethan.

BRAY, IRELAND.—At a public meeting of the Bray Library Committee it was stated that Mr. Carnegie's private secretary, writing from Skibo Castle, Sutherland, required assurance from the Committee that the library would cost, ready for occupancy, and for the purpose intended, not more than the £2,000 promised. As the Committee had accepted a tender for £1,867, and had cut matters so fine, where did they propose finding the money to meet the inevitable deficit? Mr. MacDonnell, Town Clerk, stated that he had replied that if the £2,000 which Mr. Carnegie so kindly promised should be exceeded, the excess would have to be met out of the amount of the penny rate, which had been accumulating for the past three years, namely, now £368, and with the current year's amount making £498. There has been promises of subscriptions for books from various councillors and prominent local people, and one ex-councillor, Mr. Edward Lee, promised to give £100 towards this object. The council had no hesitation in thinking that a considerable sum will be subscribed for this purpose.

BETHNAL GREEN.—The foundation stone of the new municipal buildings has just been laid. The cost of the building, including £8,560 for site and furnishing, will be £35,510. There is a frontage to Cambridge Road of 77ft., and to Patriot Square of 131ft. The Council chamber is a rectangular apartment on the first floor, with a floor space of 2,000ft. super. There is a public gallery overlooking the council chamber, and this has its own staircase to the ground floor. The architects are Mr. P Robinson, F.R.I.B.A., and Mr. W. Alban Jones, and the builders Messrs. Brand, Petit, and Co.

DUDLEY.—The foundation-stone of a new high school for girls, to cost nearly £24,000, has been laid.

DUNDEE.—The new Technical College, which is now nearing completion, will cost approximately £70,000, of which sum Sir William Ogilvy Dalgleish, Bart., has contributed £11,000.

ELY.—Lightning conductors were first fitted to Ely Cathedral about the year 1859, to the specification of Sir William Snow Harris, F.R.S., Advisor on Lightning Conductors to the Crown, but doubts were entertained as to whether these were still in an efficient condition. Mr. Alfred Hands, F.R.Met.S., was therefore instructed by the Dean and Chapter to make tests and report as to the advisability of adopting more modern methods. It has been found necessary to instal an entirely new system of copper tapes. This comprises two conductors on the western tower, with branches from the flagstaff and four turrets, two from the towers over St. Catherine's Chapel, and

(*Continued on page 270.*)

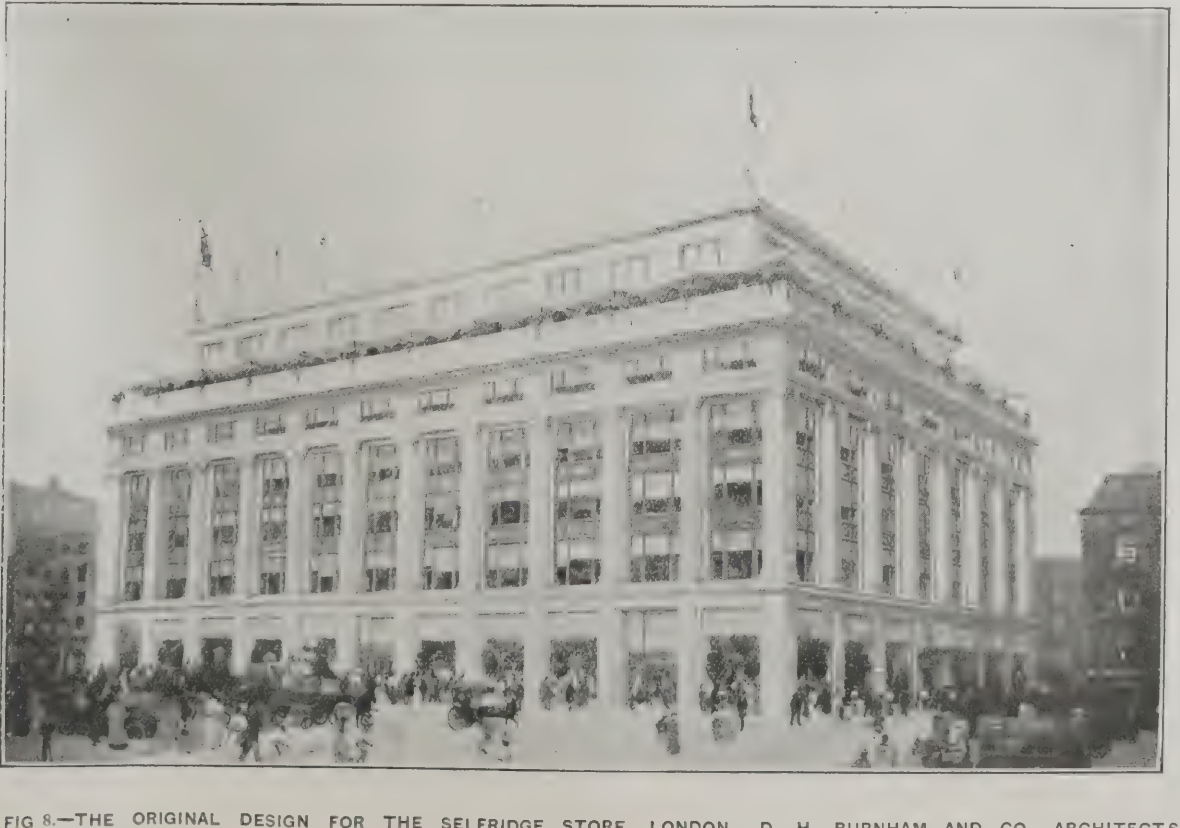


FIG 8.—THE ORIGINAL DESIGN FOR THE SELFRIDGE STORE, LONDON D. H. BURNHAM AND CO., ARCHITECTS

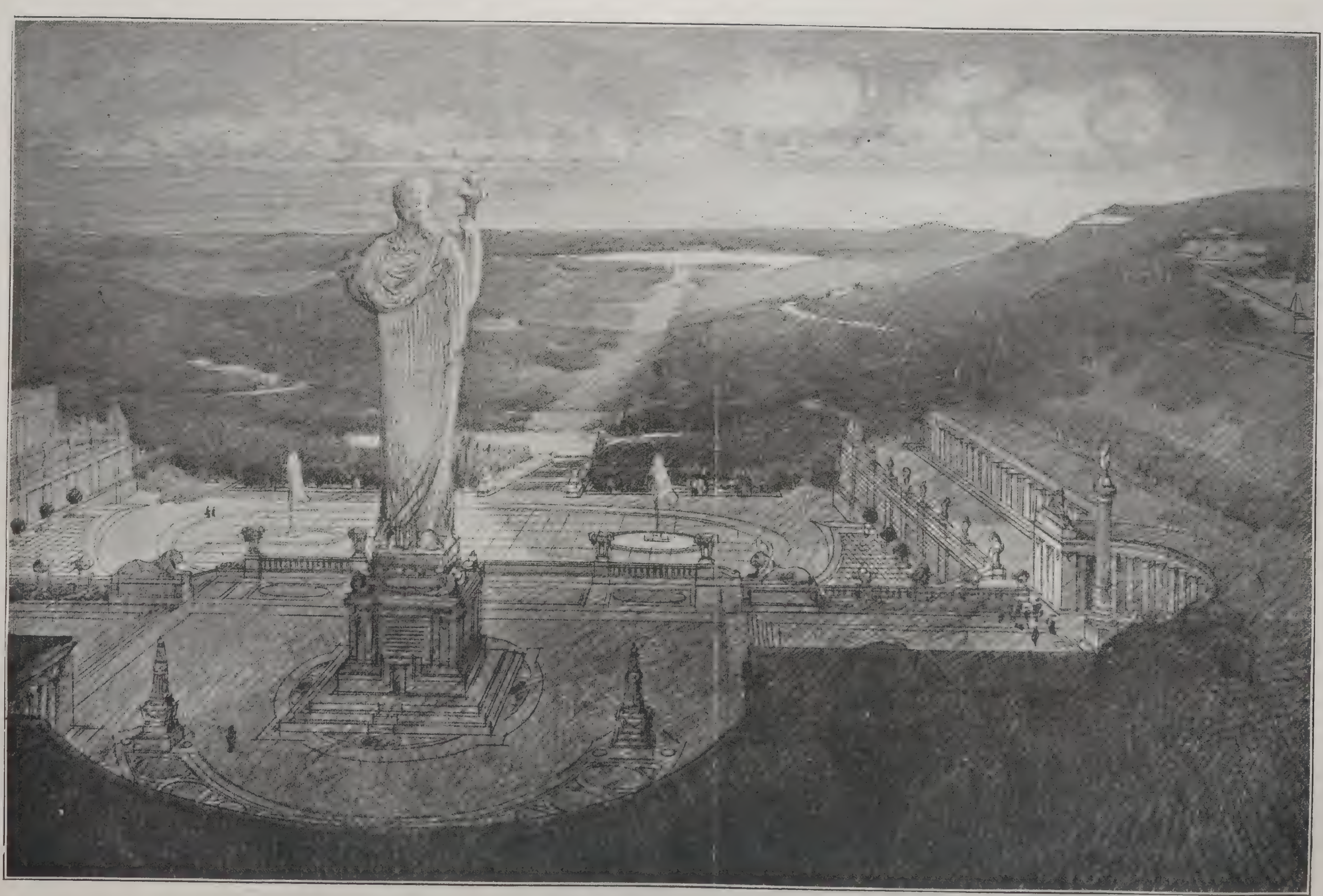


FIG. 9.—THE ATHENÆUM, SAN FRANCISCO. PART OF MR. D. H. BURNHAM'S PLAN FOR REBUILDING THE CITY.

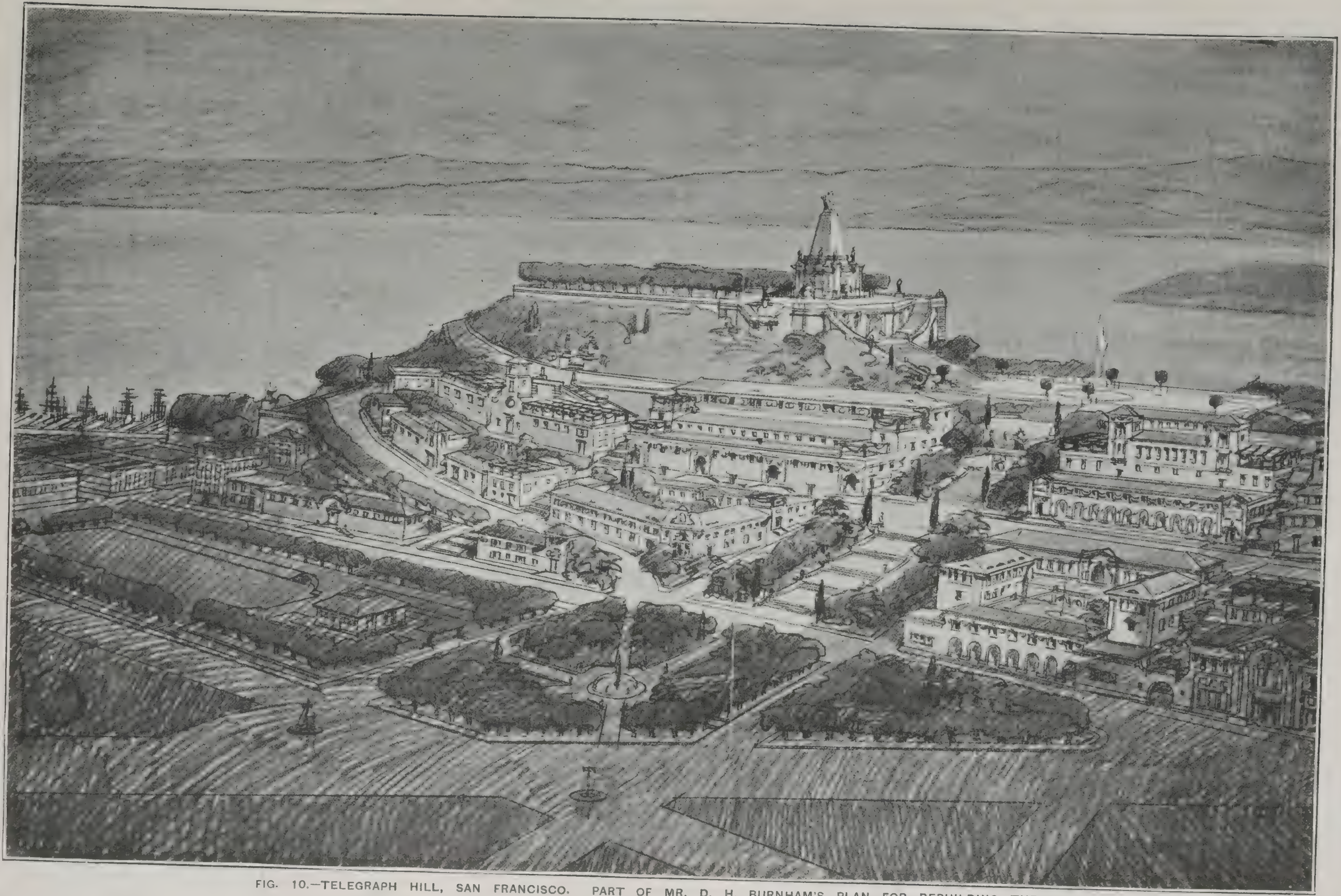


FIG. 10.—TELEGRAPH HILL, SAN FRANCISCO. PART OF MR. D. H. BURNHAM'S PLAN FOR REBUILDING THE CITY.

four from the eastern or lantern tower, as well as from the nave, choir, transepts, and Lady Chapel. The system has been arranged so as to be scarcely noticeable, and does not detract from the appearance of the cathedral, and the work has been carried out by Messrs. J. W. Gray and Son, of 91, Leadenhall Street, London, E.C., under Mr. Hand's direction.

GLASGOW.—The large extensions of the Glasgow Cancer Hospital, which will cost when completed £21,000 (exclusive of furnishings), have been erected on the most approved hospital designs, comprising all the departments required for the treatment of cancer. The reconstruction and equipment of the buildings have been carried out, under the supervision of Dr. Mackintosh, of the Western Infirmary, by Messrs. James M. Monro and Son, architects.

HAMILTON.—A new Baptist Church has been recently opened here. The building occupies a site at the corner of Kemp Street and New Street, near the Caledonian Railway Station. The style of architecture is late fifteenth century Gothic, and the total ocst of the buildings is £5,200. Messrs. Miller and Block, Glasgow, are the builders.

HANDSWORTH.—The girls' new grammar school, which is now being erected, will cost, irrespective of the furnishing, £36,000. Accommodation will be provided for 450 girls. Outwardly, the building, which will be over 300ft. long will be Renaissance in character. The architects are Messrs. J. A. Chatwin and Son. The contractors for the building are Messrs. Collins and Godfrey, of Tewkesbury, and the estimate of Messrs. Ashwell and Nesbit for the heating and ventilating apparatus has been accepted.

HARROGATE.—A new lecture hall and ladies' parlour are now being built at a cost of £2,200. Another pair of Primitive Methodist Children's Homes are also being erected. The scheme is to build in all twelve pairs of homes, each home being designed to accommodate twelve children.

HEADINGLEY, LEEDS. — The new schools, which were opened recently, will accommodate between 600 and 700 scholars, are erected in stone to harmonise with the adjoining chapel, and have open-timbered roofs. They comprise a large main hall, lecture hall, ladies' parlour, infants' rooms, six class-rooms, and a number of vestries. The total cost of the scheme, including the site, is about £4,250. The plans were prepared by Mr. G. F. Danby, of Leeds, and the entire building contract has been executed by Messrs. W. Wilson and Sons, Headingley.

LANCASTER.—The various schemes of improvement that Lord Ashton has lavishly distributed throughout his native town, are now nearing completion. The new Town Hall, the latest example of that nobleman's bounty, was designed by the late Mr. E. W. Mountford, F.R.I.B.A., who was the architect of Sheffield Town Hall, the new Old Bailey, and the new Museum and Technical School of Liverpool. The design of the new Town Hall is classic, founded on the work of Sir Christopher Wren and his pupils. To Dalton Square there is a frontage of 132ft., and to Thurnham Street of 220ft., the main entrance being in Dalton Square from a pillared portico approached by a flight of steps. In the centre of the building is the new police court, and the south end is occupied by a public hall, 101ft. by 61ft., accommodating 2,000 persons and containing a fine organ. In the tower, which stands 146ft. high, has been placed a clock and bells.

LONDON.—The Piccadilly Arcade is now in course of erection, and is hoped to be completed by March, 1910. It consists of 26 shops, the upper parts to be occupied by chambers and offices. The arcade will form a new link between Piccadilly and Jermyn Street. The architect's drawings were exhibited at the Royal Academy.

The new workhouse and infirmary at Homerton, which have been built for the Guardians of the City of London Union, have been designed for the accommodation of 661 inmates and 63 officers, and have cost between £50,000 and £55,000, the average cost per head being £154. The architect is Mr. Albert E. Pridmore, and the builder, Mr. Albert Monk, of Lower Edmonton. The whole of the work was carried out under the supervision of Mr. E. R. Dolby, M.Inst.C.E., as consulting engineer.

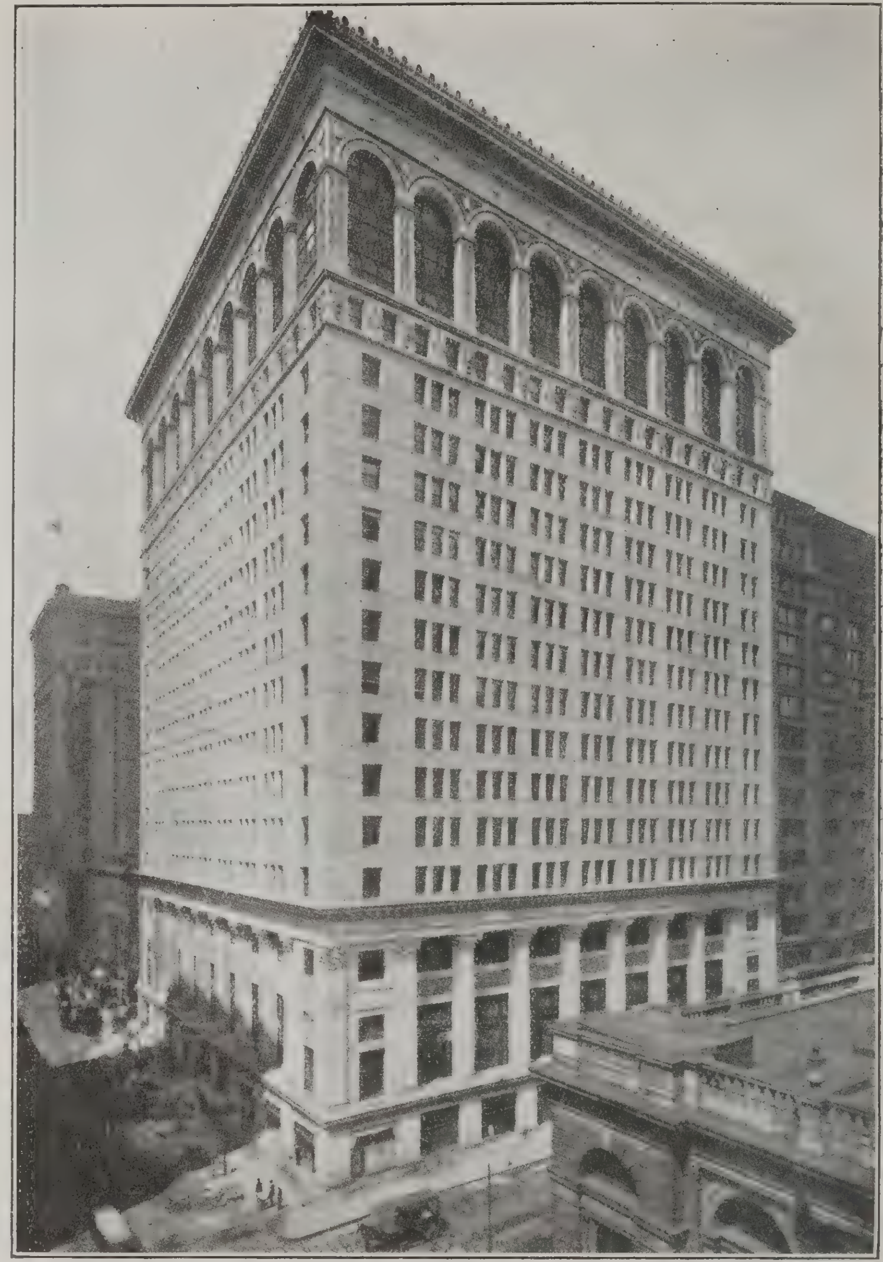
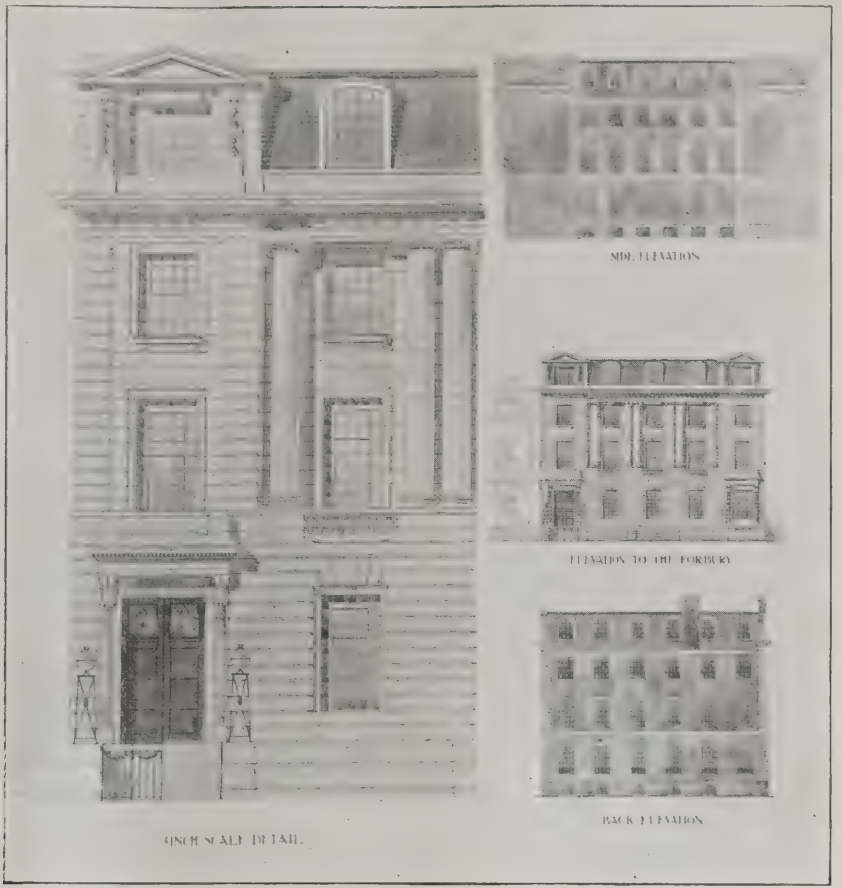


FIG. II.—THE COMMERCIAL BANK BUILDING, CHICAGO. D. H. BURNHAM AND CO., ARCHITECTS.

LONDON.—The National Hospital for the Paralysed and Epileptic, Queen's Square, Bloomsbury, will on November 2nd celebrate its jubilee, and it is intended to commemorate that event by raising a fund of £50,000 (of £1,000 for every year of its existence), which will provide a much needed extension of the out-patient department and adequate accommodation for the nursing staff, besides furnishing the nucleus of a fund which will in some degree secure the future of this great institution. The King is the patron of the hospital, which is the oldest and largest of its kind in the world. It contains 200 beds, 40 of which are at the convalescent home, and 90 incurable persons receive pensions of from £10 to £20. The main part of the building is a memorial to the Duke of Albany, and the Duchess of Albany is president of the Jubilee Committee, which has pledged itself to raise the sum necessary to carry out the improvements and alterations approved by King Edward's Hospital Fund. The sum of £17,000 has been already paid or promised, and 800 collectors are devoting themselves to this work. The King has consented to open the new buildings provided by the fund on November 4th.

MANSFIELD.—The most important of the three schemes of Church extension in Mansfield, the erection of St. Lawrence's, has now been completed. At present the church consists of a nave, chancel, sacristy, organ chamber, and vestry, giving accommodation for 320 persons, but it is hoped in the near future to add north and south aisles, when the church will hold 500 persons. The church has been built by Messrs. T. and R. Moore, from the designs of Mr. L. A. Westwick, the contract price being £3,025.

NORTHAMPTON.—The new St. Andrew's Hospital which is now in process of erection, will be two storeys in height, with a frontage of 140ft. Mr. Herbert Norman and Mr. Arthur McKewan, A.R.I.B.A., of Northampton and Birmingham, are the architects. Their plans were accepted, in open competition, for the scheme which embraced the re-building of the present school on Abington Square and the erection of a master's house and hostel on the Billing Road site. The cost of the building (which is in the hands of Mr. A. P. Hawtin) will be approximately £10,500, and the building of a boundary wall, and many other items of necessity will bring the cost to about £19,500.



BERKSHIRE COUNTY OFFICES COMPETITION. THIRD PREMIATED DESIGN. WILLS AND ANDERSON, ARCHITECTS.

The first premiated design was shown in our issue for September 22; the second, in the issue for September 29.

Proposed New Works.

HAPTON.—The plans of a new county school were recently subjected to the examination of the Parish Council. There will be seven classrooms in the proposed school, five rooms accommodating 40 scholars each, and two rooms accommodating fifty scholars each. The estimated cost of the buildings is £3,996 furnishing £300, and site £554.

PONTEFRACT.—After protracted discussions and repeated back-references of their recommendations as to the site of the proposed new Council School for Pontefract, the Education Committee have referred the whole question to the Corporation. The Corporation and the Education Committee have decided to recommend the purchase of an acre of land in Mayor's Walk from Mr. Robert Marshall, at 1s. 9d. per square yard. The alternative site was a piece of the old cricket field, at the west end, at 2s. 6d. per yard.

SCARBOROUGH.—The Entertainments Committee have adopted a scheme for the erection of a large pavilion in the Alexandra Gardens on the North Cliff at a cost of £2,500. The approval of the Town Council, however, is required.

The Petersfield Rural District Council have adopted a scheme of sewerage and sewage disposal for the parish of Liss, Hampshire, prepared by Mr. Harry W. Taylor, A.M.I.C.E. (Messrs. Taylor, Walling, and Taylor, of Newcastle-upon-Tyne, and Birmingham. The sewage will be collected by a series of sewers in the village, and conveyed down the valley to the outfall works near Andlers Ash. Here it will be pumped by oil engines and centrifugal pumps into a receiving tank, and from this it will pass through hydrolitic and detritus tanks, a percolating filter, and finally over two acres of land, the effluent ultimately discharging into the River Rother. The estimated cost of the works is £4,000.

Enquiries Answered.

Corr*espondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.*

The *Editor is willing to answer enquiries from readers who require information on architectural, constructional, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.*

Enquirers *whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.*

Answers *by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.*

This *fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.*

The *Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns*

Prohibition from Practice Under Articles of Apprenticeship.

SUSSEX.—X. Y. Z. writes: "Ten years ago I was articled to an architect, and the following clause was in my indentures, viz.: I should not at any time carry on the profession or business of an architect or surveyor anywhere within a radius of ten miles. Am I absolutely bound by this clause indefinitely, or do you think it would not hold good now after ten years have expired? Of course, you understand I don't wish to take any of the work in an underhanded way. I have approached him on the matter, and he refuses consent."

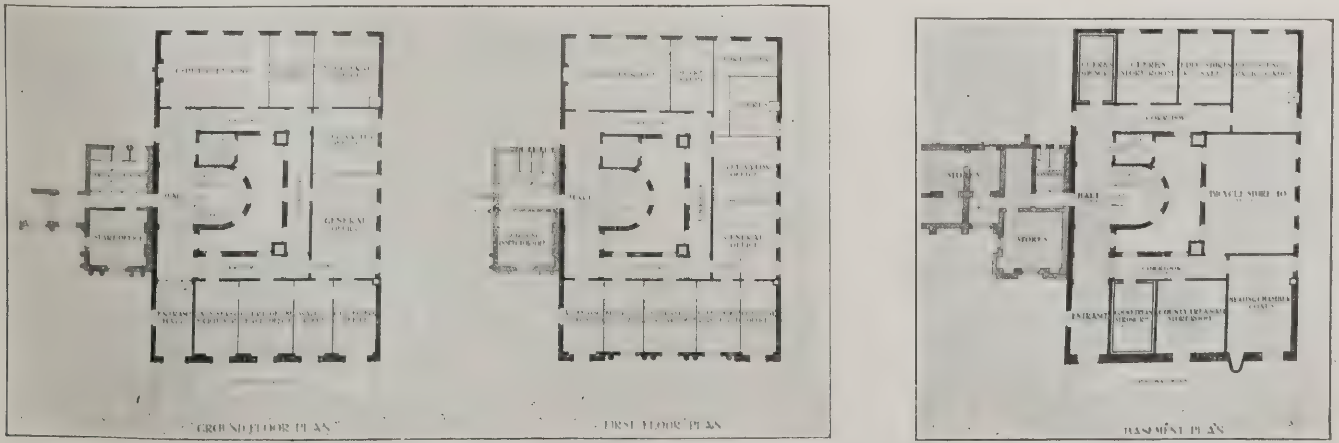
—Certainly you are bound by the terms of the original articles so long as your late principal practises in the district; and it is even possible that they may hold good to a successor should he sell his business. His legal remedy if you break your covenant is to obtain an injunction to prevent you, and it is probable also that damages would lie against you—though this latter would become a matter of proof that damages had actually been sustained.

F.S.I.

R.I.B.A. Mechanics and Physics.

"Would you kindly let me know of a book on mechanics and physics which would be sufficient for the requirements of the Preliminary R.I.B.A. examination?"

—There are a great number of text-books on the subjects of mechanics and physics, suitable for the Preliminary R.I.B.A. examination. The two we can most confidently recommend from experience are "Elementary Physics," by M R. Wright; "Theoretical Mechanics," by J. E. Taylor. Both belong to Messrs. Longmans, Green and Co.'s Elementary Science Manuals. B. and B.



BERKSHIRE COUNTY OFFICES COMPETITION. THIRD PREMIATED DESIGN. WILLS AND ANDERSON, ARCHITECTS.

Book on Hot-water Work.

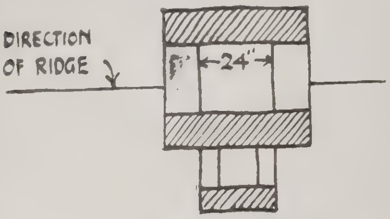
SHEFFIELD.—J. M. AND SON write: "Can you recommend a book dealing with domestic hot-water supply, flow-and-return, etc., both for the cylinder system and also the tank system, for use by our apprentices?"

—An excellent book on "Domestic Hot Water Work," by Fredk. Dye, which should exactly suit the requirements stated, is published, price 2s., by Messrs. Cassell and Company, Ltd., Ludgate Hill, London, E.C.

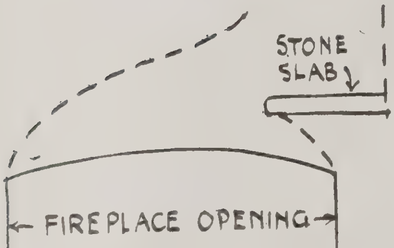
Flue Construction.

WELLINGTON.—E. T. H. writes: "I am building a small farmhouse which has a wide open fireplace. My experience is that it is very difficult to construct these so not to smoke. In the present case my flue is not less than 2ft. square, and I think it advisable not to curtail same at the top. My idea is to cover flues on top, and have outlets for smoke at sides. Can you suggest a better way?"

—The covering above the top of the flues will, by keeping the chimney dry internally, greatly improve the chances of the flues drawing properly, and will also lessen the likelihood of down-draught. The side openings would perhaps be more effective if they occurred in each case on opposite sides of the chimney, or as that appears impossible in this case, the opening not so placed might be altogether closed and the remaining two enlarged as sketch A above. The flue is very large, and despite these precautions may not be found satisfactory. If circumstances permit, the throat of the flue may be constructed as sketch B, which has been found effective in baffling down-draught in some obstinate cases. G.



SKETCH "A"



SKETCH "B"

Law as to Advertising for Tenders.

SOUTHAMPTON. — MANUFACTURER writes: "Will you kindly advise me what is the law relative to the advertising for tenders by borough engineers? Assuming it to be a fact that they are obliged to advertise publicly all work over a certain amount, will you give your opinion whether by including in a contract which was advertised, prime cost sums of substantial amount for which tenders have not been advertised, such law has not been complied with."

—In the absence of more precise particulars, we should suppose that the advertisement of the general contract included all the items, and that the authority is not bound to dissect the contract in the manner suggested.

Mr. Alec. W. Percival, P.A.S.I., architect and surveyor, has removed from 12, George Street, Plymouth, to Sun Buildings, Bedford Street, Plymouth. Telephone, 222 Plymouth.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION
Oct. 30.	TECHNICAL AND SECONDARY SCHOOL, WORKINGTON. The Cumberland Education Committee invite architects to submit sketch plans with outline specification and estimate for a technical and secondary school in the Borough of Workington, Cumberland, for about 300 pupils of both sexes. Further particulars and conditions upon which plans will be received may be obtained from the undersigned on receipt of a stamped and addressed foolscap envelope and the payment of a deposit of one guinea, which will be returned on receipt of a set of plans in accordance with the conditions. The deposit will also be returned to architects not desiring to compete if all papers sent are returned within seven days. Last day for receiving plans, Saturday, Oct. 30, 1909. C. Courtenay Hodgson, Secretary, The Courts, Carlisle.
Nov. 1.	PRESTON GRAMMAR SCHOOL FOR BOYS. Preston Town Council invite competitive designs and plans from architects practising as principals, for a new grammar school for boys, to be erected in Moor Park Avenue, Preston, and estimates for the same. Premiums of £50, £30. and £20 are offered. The Corporation have appointed a professional assessor. Application to be made to Mr. Alfred Howarth, Town Clerk, Town Hall, Preston, and designs and plans must be sent in by 10 a.m. on Nov. 1.
Nov. 30.	HERNE BAY PAVILION ON PIER. Herne Bay Urban District Council invite competitive drawings for a pavilion to be erected on the proposed extension of the pier at a total cost not exceeding £4,000, exclusive of architect's commission. Premiums of twenty-five guineas and ten guineas respectively will be awarded for such two designs as shall be judged of sufficient merit by the Council, and placed by them as first and second; the premium of twenty-five guineas to be afterwards merged into the usual commission payable to the architect, provided the work is carried out by such competitor. Plan of the site and copy of the conditions may be obtained on application to the undersigned on and after the 24th instant on payment of one guinea, which will be returned on receipt of a bona-fide design. Drawings to be deposited at the Clerk's Office, Town Hall, Herne Bay, not later than noon on the 30th November next.—Joseph Jubb, Clerk to the Council, Town Hall, Herne Bay.
Dec. 18	TRAINING COLLEGE FOR TEACHERS, Kirkstall Grange, Far Headingly. Leeds. Architects practising in Leeds are invited to submit competitive designs for the above College. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed to assist and advise the committee in deciding the competition. The competition will be for the educational block and for the general laying out of the estate including the position of the various hostels, swimming bath, laundry, sanatorium, principal's house, vice-principal's house, lodges, gardens, playing-fields, roads, etc. On the payment of a deposit of £2 2s. (which will be returned on receipt of a bona-fide design) each competing architect may obtain a copy of the conditions of competition and instructions, a plan of each floor of the educational blocks and of the hostel blocks, also an estate plan, showing a suggestion for grouping the various buildings. Designs to be delivered to the undersigned not later than 12 o'clock noon, on Saturday, 18th December, 1909. James Graham, Secretary for Education, Education Department, Leeds.
Jan. 31, 1910.	NATIONAL MUSEUM OF WALES. The Council desires to receive competitive designs for the erection of a new National Museum at Cardiff, Three premiums are offered of £200, £150, and £100, for second, third, and fourth. The Council have appointed Sir Aston Webb, R.A., Mr. John J. Burnet A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A., as Assessors. Particulars and plans of the site will be supplied to competitors on payment of a fee of £2 2s., which will be returned on receipt of a design in accordance with the conditions, or if all papers are returned within 14 days. Inquiries to be addressed to Dr. Wm. Evans, Hoyle. Director of the Museums. City Hall, Cardiff.

Our Plate.

Newburn District Council Offices.

We give plans, sections, and elevation of this building, the architect being Mr. Edward Cratney, of Wallsend-on-Tyne, whose design was placed first in the recent competition. Some notes on the design appeared in our last issue.

SECONDARY SCHOOL FOR BOYS, MAIDENHEAD.

The materials of which this school is built are, generally, red brick, with tile courses, copings, etc. The woodwork is painted ivory white. The hall was to be used for art classes and meals, for which reason the class-rooms are approached by corridors, sufficient space being left in the hall for gangways, and a north light provided. The upper floor provides a science laboratory, and further class-room accommodation; mistresses' room, etc. The school provides 150 places, and cubes up, at the restricted amount of £5,000, at 6d. The general shape of the buildings was determined by the site and surroundings with a view of getting an equal exposure to all class-rooms, etc. Basement to provide dinners. Mr. A. O. Cave is the architect.

Coming Events.

Friday, October 8.

ARCHITECTURAL ASSOCIATION, 18, Tufton Street, Westminster.—Annual General Meeting; President's Address (by Mr. Henry Tanner, F.R.I.B.A.,) and Distribution of Prizes. 7.30 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION, 6, Higham Place, Newcastle-on-Tyne.—Visit to Scotswood Council Schools and Denton Hall. Members will assemble at Newcastle Station at 2.15 p.m.

Thursday, October 14.

SOCIETY OF ARCHITECTS, Staple Inn Buildings (South), Holborn, W.C.—Twenty-fifth Annual General Meeting, 8 p.m.

Federation News.

LONDON MASTER BUILDERS' ASSOCIATION.

Secretary: T. Costigan.

The usual monthly meeting of the Council of London Master Builders' Association was held on Thursday, September 16th, the president, Mr. F. G. Rice, in the chair.

The President reported to the Council upon the visit of Belgian master builders to London, and the steps taken to make the visit pleasant and useful. Much gratification was expressed at the results, and the Council passed a vote of thanks to the president and sub-committee for their successful arrangements of the receptional dinner given to the visitors, numbering about 100, at the St. Ermin's Hotel, Westminster, when a good many members of the London Master Builders' Association and ladies were present. The following telegram received from the President of the Antwerp Association of Master Builders was read: "Dover Pier, 15th August, 1909.—To Mr. Rice, president London Master Builders' Association.—Before leaving England, the Belgian Master Builders wish to send to your Association their brotherly salute, with the expression of their feeling of gratitude for your kind reception, which they will remember for ever.—HESBAIN."

The chairman of the organisation committee (Mr. F. Higgs) reported to the Council the recommendations of this committee which, after considerable discussion, were agreed to, and instructions issued to give due effect to their adoption.

In response to an invitation from the president of the Quantity Surveyors' Association, the president (Mr. F. G. Rice), Mr. Frank May, Mr. Benjamin I. Greenwood, and Mr. G. Bird Godson, were selected to represent the L.M.B.A. at a conference re tendering without quantities being supplied, on Wednesday, October 13th.

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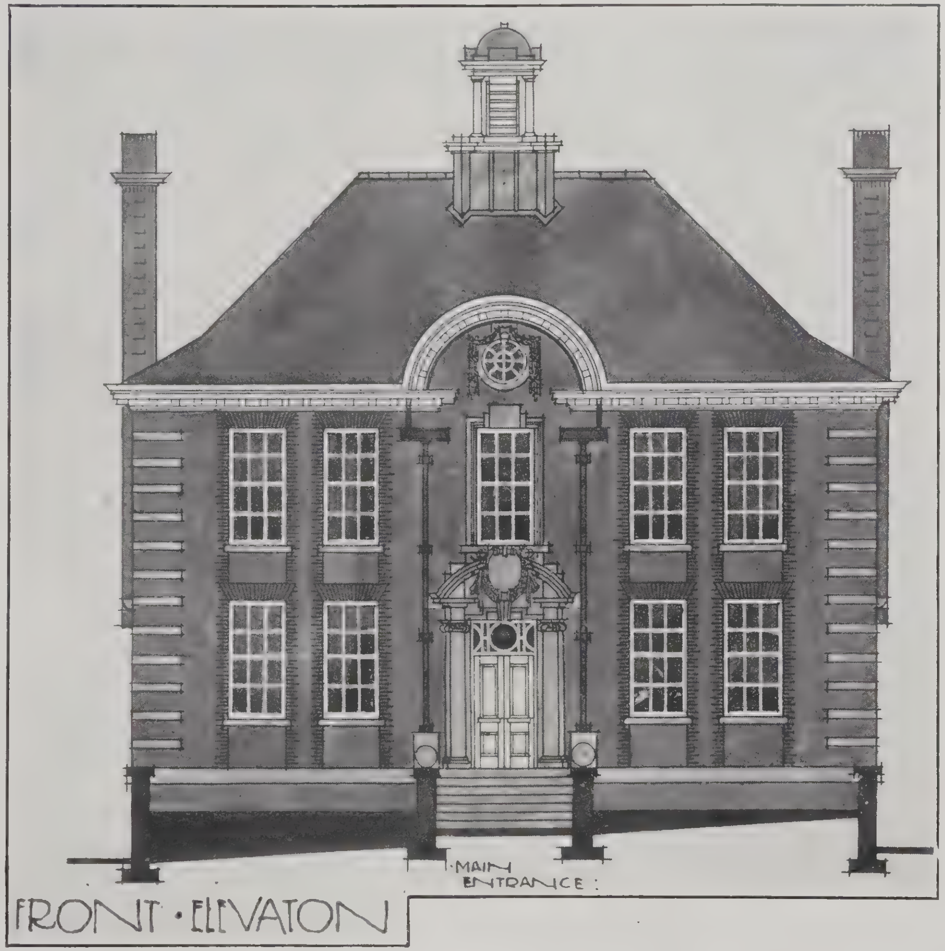
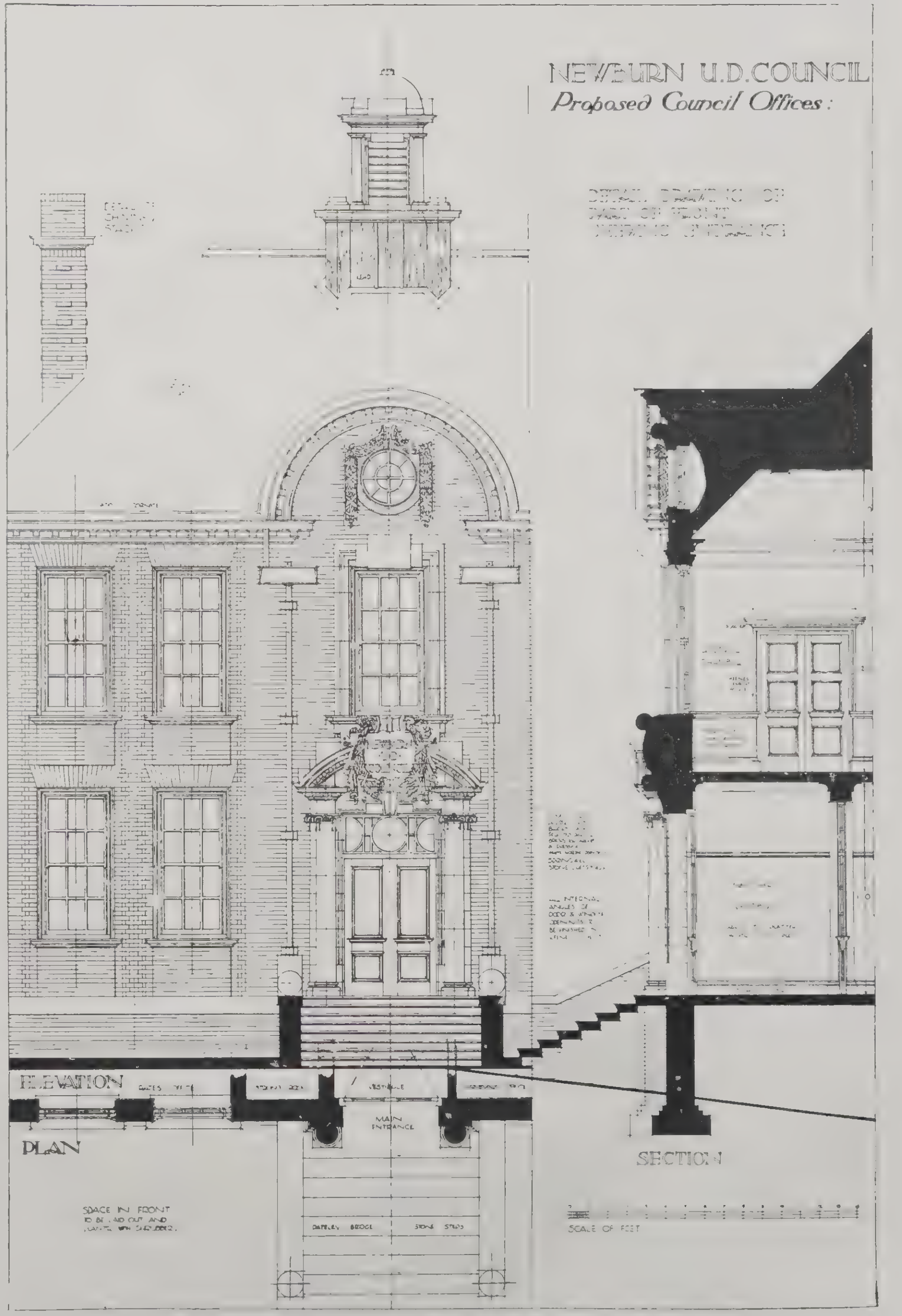
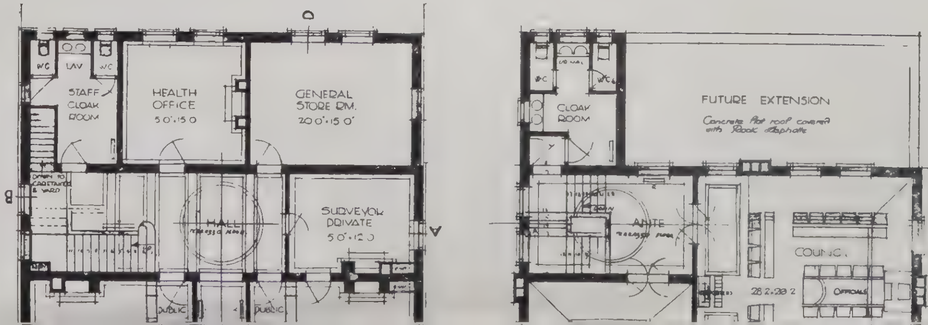
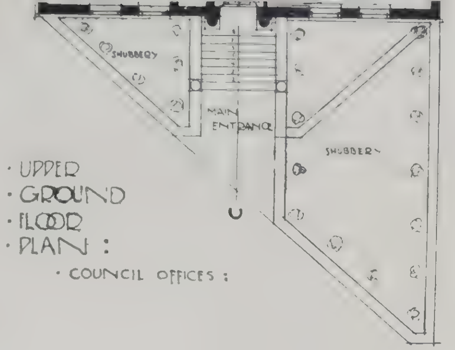
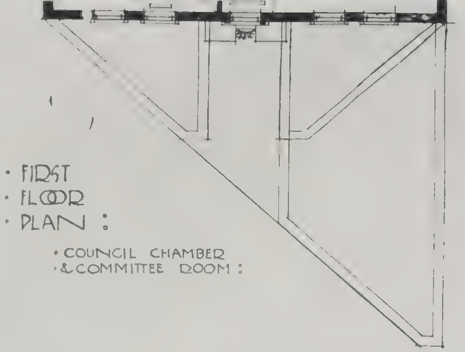

MAIN ENTRANCE:
FRONT · ELEVATON


NEWBURN U.D. COUNCIL
Proposed Council Offices:
DETAIL DRAWING OF PART OF FRONT SHOWING ENTRANCE
ELEVATION
PLAN
MAIN ENTRANCE
SPACE IN FRONT TO BE LAID OUT AND PLANTED WITH SHRUBBERY
SECTION
SCALE OF FEET

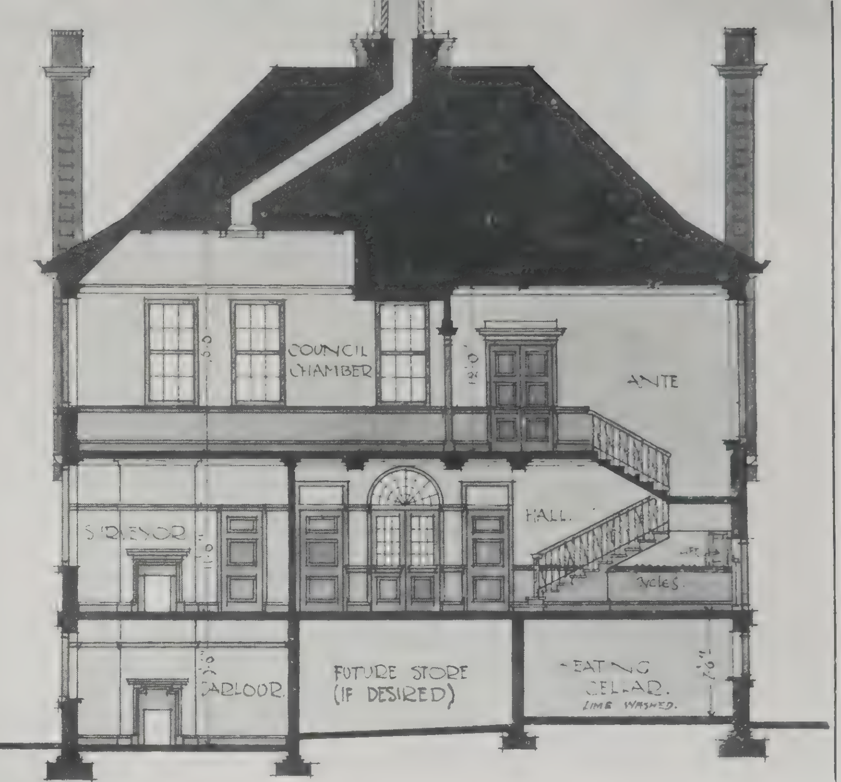

W.C.
LAV
W.C.
STAFF CLOAK ROOM
HEALTH OFFICE 5'0"·15'0
GENERAL STORE RM. 20'0"·15'0"
HALL
SURVEYOR PRIVATE 5'0"·12'0
B
A
PUBLIC
PUBLIC
CLOAK ROOM
FUTURE EXTENSION
Concrete flat roof covered with Rock Asphalte
ANTE
COUNCIL
28'2·28'2
OFFICIALS



· UPPER
· GROUND
· FLOOR
· PLAN :
· COUNCIL OFFICES :



· FIRST
· FLOOR
· PLAN :
· COUNCIL CHAMBER
· & COMMITTEE ROOM :



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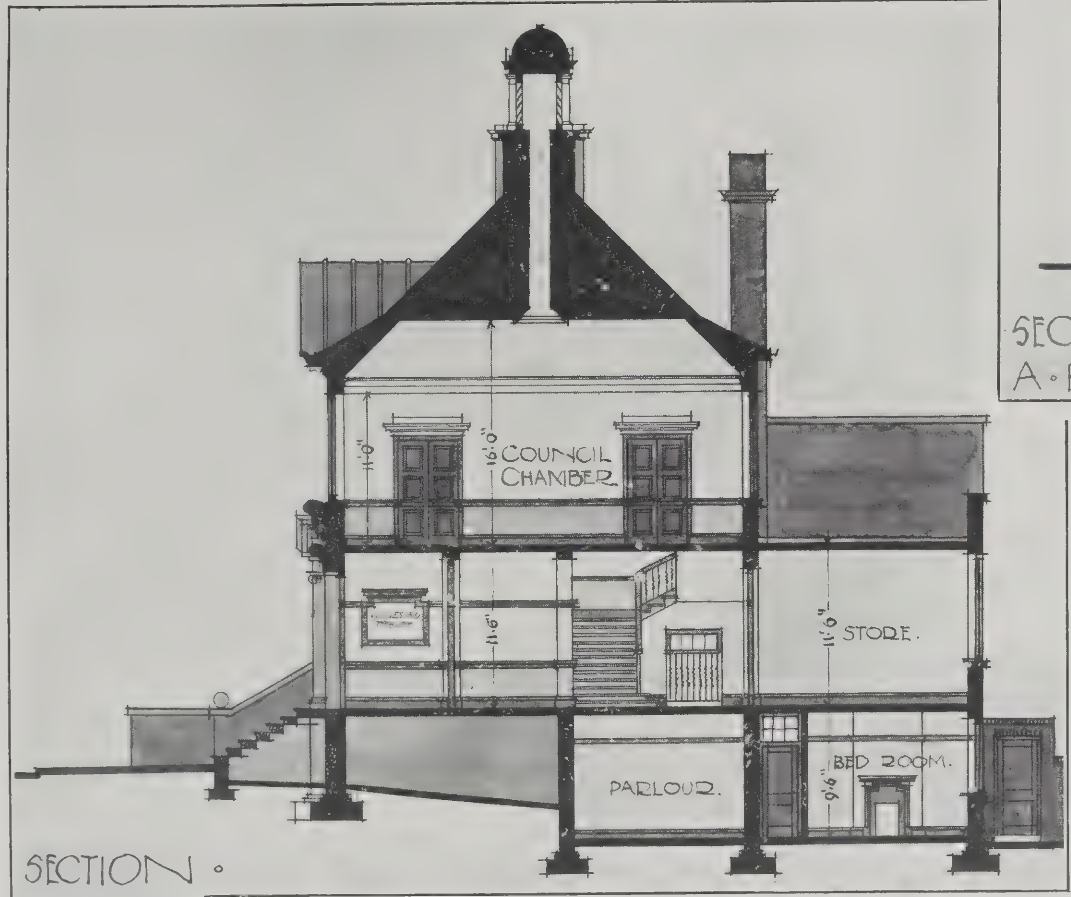


SECTION ·
C · D :

THE NEWBURN COUNCIL OFFICES
COMPETITION.

SELECTED DESIGN :
EDWARD CRATNEY, ARCHITECT.

Legal matters of considerable importance to the trade were discussed, and referred to the solicitor for consideration and report.

The secretary reported that the new agreement betwen the National Federation of Building Trade Employers and the National Association of Operative Plasterers was signed by the respective delegates, with the following provision required by the Council of the L.M.B.A. duly inserted: "That it be an instruction in signing the amended general rules that it be done with the understanding with the operatives that the present rules between the L.M.B.A. and the N.A.O.P. be thereby not superseded."

The president called attention to the opening of the extension of the L.C.C. School of Building at Brixton, intimating that he hoped to be present and to be supported by the members of the Council, to whom the principal of the school had extended a cordial invitation. Mr. F. L. Dove, L.C.C., past president, promised to give an address to the students.

A letter was read from the Carpenters' Company with reference to their exhibition of woodwork in 1910, and instructions given.

The article in the "Builders' Journal" on "Builders' Locked-up Capital" was referred to, but, owing to the lateness of the hour, this and several other matters were deferred to the next Council meeting.

BOLTON AND FARNWORTH ASSOCIATION.

Secretary: J. R. Vose, F.C.I.S.

Various matters of importance have been before the Bolton and Farnworth Association at their recent meetings. One of the members had had a dispute as to the balance of account for a considerable sum with a local public authority, and was unable to get complete satisfaction, owing, it was alleged, to the form of contract which he had signed, which made the surveyor the sole arbitrator. The conditions of the work and orders given made the position one of a very contentious character, and led to much dissatisfaction on the measuring up of the job. The association appointed a special sub-committee to go into the matter, and have, after considerable trouble, and interviews with counsel, succeeded in bringing the matter to a fairly satisfactory issue.

The association is further considering the question of technical education in its relation to the building trade, and representations will be made to the local education authority on completion of the report.

It has further been decided to complete a day work price list for all trades, to be contained in book form. The increase of membership continues to be satisfactory.

Up to date 17 new members have joined this year.

Several matters of importance to the trade, including the maintaining of works for a period of three years after completion, are to be considered.

It is intended to invite the contractors at Horwich to a meeting to be held there, with a view to their joining the local association, as they are at present unattached.

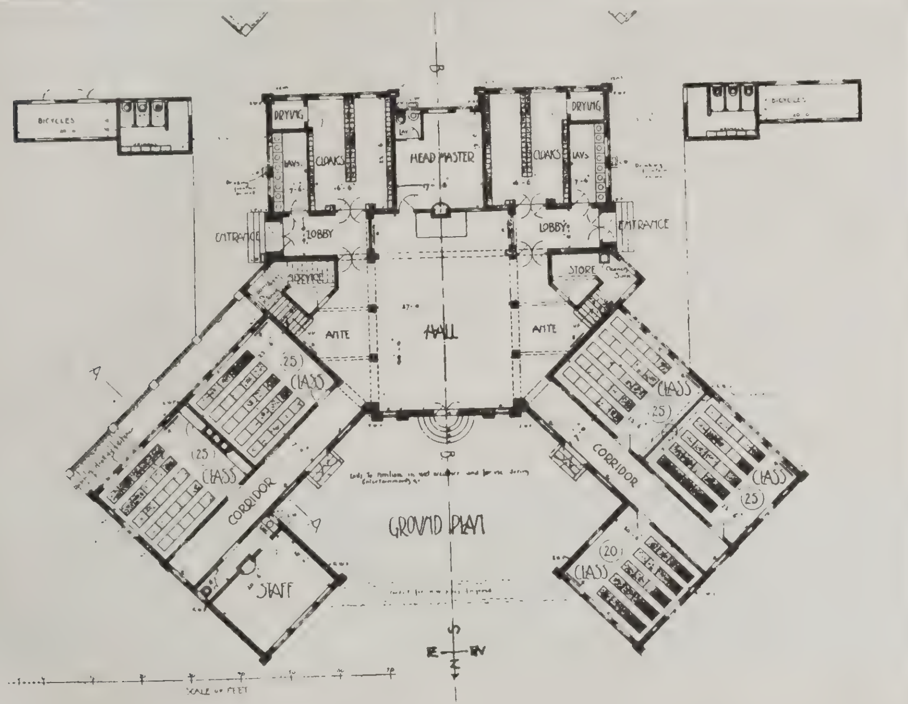
BIRMINGHAM ASSOCIATION.

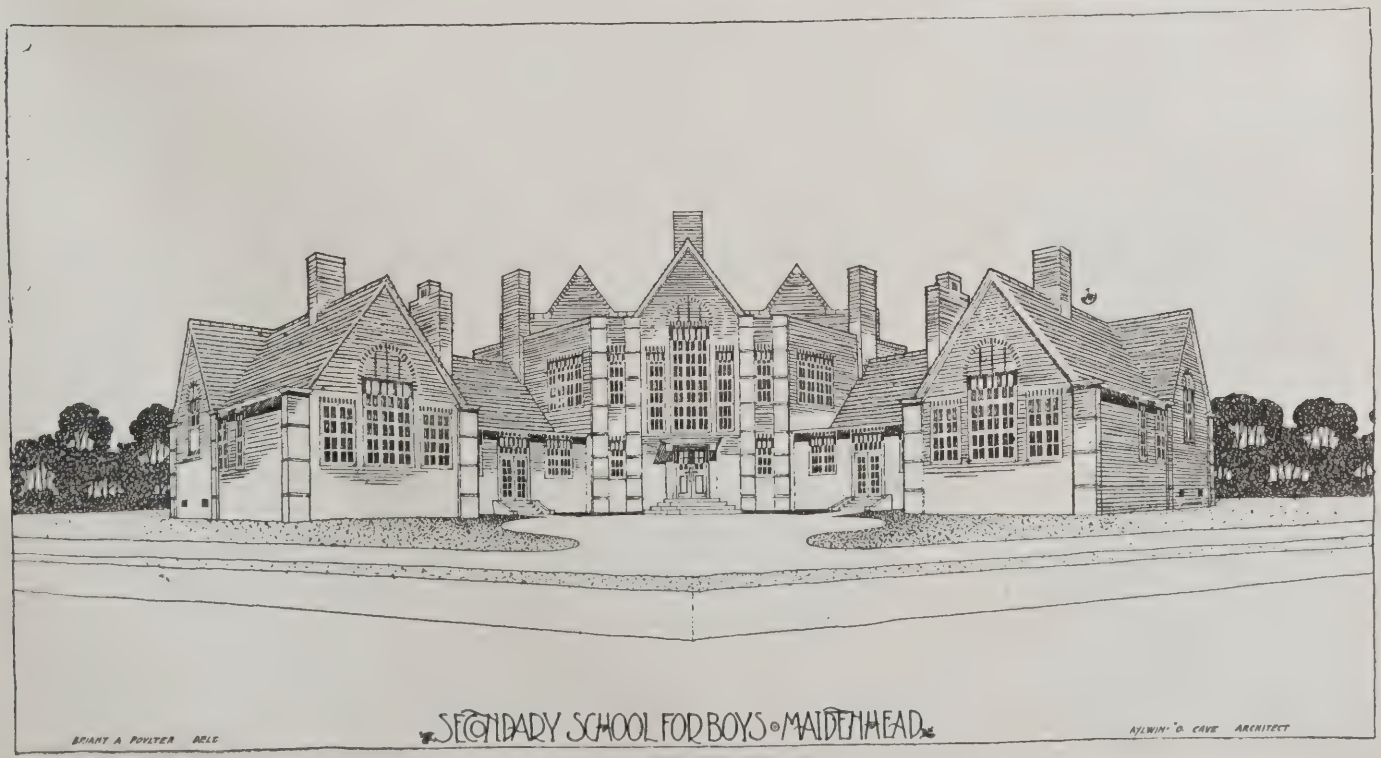
Secretary: E. J. Bigwood.

A meeting of the local conciliation board was held at the Imperial Hotel, Temple Street, Birmingham, on Tuesday, September 21st. Mr. C. H. Barnsley presided, and there were present eight employers and eleven operatives.

The business was to consider further a dispute between the bricklayers and certain members of the King's Norton Master Builders' Association, the complaint being that these builders, who were carrying on work within the radius governed by the Birmingham Association, would not work to the Birmingham working rules.

The matter was considered at a meeting of the board on July 1st, and, on the suggestion of the King's Norton builders, the matter was adjourned in order that the operatives might meet them with a view to a settlement being arrived at; but the operatives now reported that they had not been able to arrive at any settlement; hence the necessity for this meeting. After the matter had been fully discussed, on the proposition of Mr. F. G. Whittall (president of the Birmingham Building Trades Employers' Association), seconded by Mr. E. T. Barker (of the Carpenters' Society), the following resolution was passed, *nem. con.*:—"That, it having been reported to this board that certain builders are not working to the Birmingham





AYLWIN O. CAVE, ARCHITECT.

rules, within the area of that association, this board decides that the rules must be made effective within the Birmingham area."

It was also decided that copies of the above resolution be forwarded to the secretary of the King's Norton Master Builders' Association, and to the several builders who, the operatives report, were infringing the rules.

Views and Reviews.

Building Construction.*

The sixth edition of Mitchell's "Building Construction — Advanced and Honours Courses," appears opportunely on the eve of the autumn session of study. Its bulk, which apparently increases materially with each successive issue, signalises or typifies the enormous advance that has been made within the past few years in the science of building construction, and is in itself a very substantial proof of the rapid accumulation of the more or less abstruse data that are essential to an all-round acquaintance with this subject.

Mr. Charles F. Mitchell has been assisted in the production of the work not only by Mr. George A. Mitchell, whose name appears on the title-page, but by half a dozen other specialists in various departments, whose services are acknowledged in the preface. The chief alterations and extensions have occurred in the chapters relating to limes and cements, concrete, plastering, timber, paints and varnishes, brickwork, flues, fireplaces, and tall chimneys, skeleton steel construction, reinforced concrete, joinery, sanitation, and hot water apparatus and heating, and the chapter on reinforced concrete is supplemented by an abridged summary of the R.I.B.A. report on that subject. Obviously the book is extremely useful not only to students, but as a valuable work of reference for architects and builders; most of the information given is tersely and clearly put, has endured the test of time, and has undergone repeated revision.

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*Building Construction: A Textbook on the Principles and Details of Modern Construction, for the Use of Students and Practical Men. Advanced and Honours Courses (comprising stages 2, 3, and Honours). By Charles F. Mitchell, assisted by George A. Mitchell. Containing 900 pages of Text, with about 800 illustrations, including 24 double-page plates. Crown 8vo, cloth, price 6s. London: B. T. Batsford, 94, High Holborn, W.C.

Oxide of Zinc as a Paint Base.†

There has been, within the past few years, a notable intensification of research into the nature and properties of materials. The zeal for rather severe scientific training is apparently beginning in this country to yield results that are in some degree comparable to those that have been by similar means achieved abroad, more particularly in Germany. We can now point to a growing band of well-trained and earnest workers on scientific lines, who are able to tell us more about materials than was dreamt in the philosophy of the generation immediately preceding us. Notable among those who have probed into these mysteries is Mr. J. Cruickshank Smith, who has specialised on the manufacture and application of paint, and has recorded his observations in many excellent articles and lectures, and in at least one good book, bearing the rather formidable title of "The Manufacture of Paint." He has now contributed to "The Decorator" series of practical handbooks, which are edited by Mr. Arthur Seymour Jennings, a capital little monograph on "Oxide of Zinc, its Nature, Properties, and Uses." Zinc white, long unduly neglected because it was thought to have insufficient body, is now coming rapidly into favour; and this book, by supplying exactly the kind of knowledge before which ignorant prejudice must vanish, will no doubt largely increase the popularity of a pigment that, unlike its older rival, white lead, is non-poisonous, keeps its colour in chemically polluted atmospheres, and is innocent of the peculiarly pungent smell that gets paint such a bad name. Speaking of names, it may be here useful to repeat the author's caution that at the present time, while, in the paint trade, zinc white is frequently understood to mean oxide of zinc, two totally different pigments are sold as zinc white, and it is therefore safer to employ the term oxide of zinc when that pigment is required. It will surprise many to learn that it was as long ago as 1781 that Courtois brought oxide of zinc into commercial prominence. The book is written in an interesting style, and will be found valuable to paint users as well as to manufacturers.

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†Oxide of Zinc: Its Nature, Properties, and Uses. With Special Reference to the Making and Application of Paint. By J. Cruickshank Smith, B.Sc., F.C.S. With a Chapter by A. P. Laurie, M.A., D.Sc. London: The Trade Papers Publishing Co., Ltd., 345, Birkbeck Bank Chambers, W.C

Of Interest to Surveyors.*

The planimeter, an instrument for computing mechanically the areas of plane figures, performing this process directly from the drawing or other surface, without the intervention of a ruled transparency, dates from the early part of the last century, the first instrument to be called by this name having been invented in 1827 by Oppenkoffer; while the polar planimeter was made known in 1854 by Jacob Amsaer, Professor of Mathematics at Schaffhausen. This is the intrument that is now generally in use, and Mr. Gray gives a thorough and lucid explanation of what computations can be made with it, showing plainly how it is that so simple an instrument can be made to dispense with intricate calculations. There are twenty-nine diagrams, illustrating the methods of solving various problems that are of special interest to surveyors.

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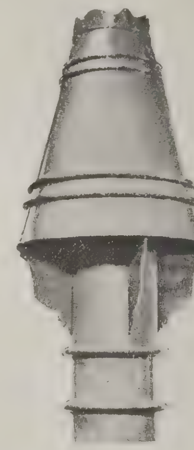
*The Polar Planimeter: How it is used, and how it operates. A Simple Treatise. By Frank J. Gray, A.M.Inst.C.E., etc. London: St. Bride's Press, Ltd., 24, Bride Lane, Fleet Street, E.C. 1s. nett.

Trade and Craft.

Milne's Syphonic Chimney Top.

The time is at hand when the perennial smoky chimney nuisance will assume the utmost aggressiveness. There may still remain, however, several weeks in which to take precautions against the miseries suffered in former seasons. An effectual cure, which has successfully withstood the test of eleven or twelve years' application, is provided by Mr. Edward P. Milne in the form of the anti-down-draught chimney-top shown in the accompanying illustration. The action of this chimney-top is syphonic, so that the main flue is not affected by any atmospheric depression, while the up-draught is very considerably increased. Moreover, it is noiseless, and the interior is so formed as to offer no obstruction to the chimney-sweep's brush. The down-draught nuisance is not merely a cause of discomfort to the householder. Its absolute wastefulness is evident when the cook complains that her oven will not heat, and when the engineer suffers blame and loss because the want of updraught robs his fire-grate, kitchen range, or heating intallation of their stated efficiency. That Milne's Syphonic Chimney Top is an effectual remedy for all these troubles is proved by the many repeat orders received, and by the fact that, as already stated, it has remained in constant favour for about a dozen years. Mr. E. P. Milne's address is 15, Craven Street, London, W.C.



Steel Rolling Shutters.

Messrs. Arthur L. Gibson and Company announce the completion of their new Radnor Works, Strawberry Vale, Twickenham, and that all future orders for Kinnear patent steel rolling shutters will be filled from that address. Until further notice all correspondence should be sent to the present address, 19, 20, and 21, Tower Street, Upper Saint Martin's Lane, London, W.C.

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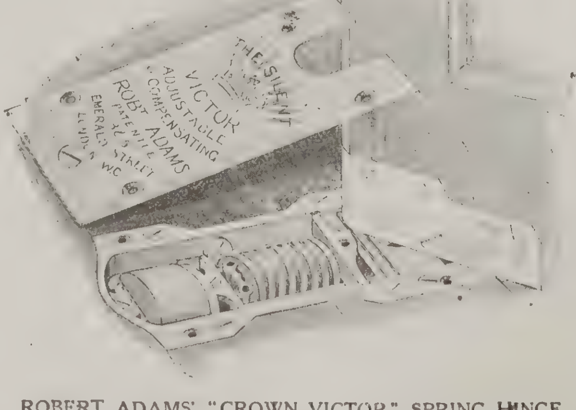

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Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bredon (Worcestershire).—For alterations to, and repair of, dilapidations at the Manor House, Bredon, near Tewkesbury, for Mr. C. J. Ratcliff. Mr. C. M. C. Armstrong, architect, Warwick:—

Collins and Godfrey, Tewkesbury	£582
G. F. Smith and Sons, Leamington	550
T. Broad, Ltd., Malvern	508
A. C. Billings and Sons,* Cheltenham	506

*Accepted.

Fareham.—For alterations and additions to the Town Hall building:—

W. H. Glover	£970
E. Wilcox	884
H. Plummer	880
W. G. Latty	857
W. H. Chance and Son*	855

All of Fareham.

*Accepted.

Harlington.—For alterations to Harlington Baptist Church. Messrs. George Baines and Son, architects, 5, Clements Inn, Strand, London, W.C.:

W. Portsmouth, Estimates D. and E. not tendered for	£262	1	0
C. Keen, Estimates A. to G.	241	18	6
A. Winch, Estimates A. to G.	246	8	0
T. Crutchfield*	212	18	6

*Accepted.

Hilderthorpe (Bridlington).—For erecting and completing two semi-detached villas on the Marine Drive, Hilderthorpe, for Mrs. F. Piercy. Mr. Henry Phillips, C.E., architect, Alexandra Buildings, Scale Lane, Hull. Quantities by architect:—

W. Finch	£1,600	0	0
F. Martindale	1,540	0	0
C. Gant	1,487	16	0
J. Allison and Son	1,386	0	0
C. Clark	1,368	0	0
T. Gray,* Bridlington	1,280	0	0

* Accepted.

Ilkeston.—Accepted for the erection of the new Hall Croft Council schools, for the Education Committee:—

A. Earnshaw, Ilkeston, £7,350.

Llandrindod Wells. — For extensions to Holy Trinity Church, Llandrindod Wells. Mr. R. Wellings Thomas, F.R.I.B.A., architect, Llandrindod Wells:—

Hughes and Stirling, Liverpool	£4,621	10	0
W. P. Lewis and Co., Hereford	4,420	0	0
Stephens, Bastow and Co., Bristol	4,258	0	0
J. Hopton, Llandrindod Wells†	4,234	13	8
Turford and Southward, Ludlow	4,061	0	0
D. and A. Meredith,* Llandrindod Wells	4,000	0	0

†Not including extra for oak roof.

*Accepted.

London, S.W.—For the making up and paving of Pulborough Road, Southfield, for the Wandsworth Borough Council. Mr. P. Dodd, borough engineer:—

A. L. Etheridge	£1,611	10	0
Potter and Co.	1,565	8	0
S. Lane and Co.	1,540	0	0
E. Parry and Co.	1,489	0	0
T. Adams	1,478	0	0
Harringdon and Co.	1,465	0	0
S. Kavanagh and Co.	1,462	0	0
E. and E. Iles	1,450	0	0
J. Mowlem and Co., Ltd.	1,445	0	0
R. Dykes*	1,279	0	0

Borough engineer's estimate, £1,465 13s. 11d.

*Recommended for acceptance.

Loose, near Maidstone.—For erection of Isolation Hospital, on a site adjacent to Well Street, in the parish of Loose, near Maidstone, for the Maidstone Rural District Council. Messrs. Ruck and Smith, architects, 86, Week Street, Maidstone,

J. Smith and Sons, Ltd., South Norwood	£4,350	0	0
S. Edwards, Wimbledon	4,346	0	0
F. and G. Foster, Norwood Junction	4,235	0	0
G. H. Denne and Son, Deal	4,198	0	0
Davis and Leaney, Gouldhurst	4,182	0	0
J. Wood and Sons, Boughton, Mon.	4,133	0	0
W. Wallis, Ltd., Balham	4,112	15	0
W. T. Burrows	4,110	18	6
G. E. Wallis and Sons, Ltd.	4,036	0	0
R. Corben and Co.	3,998	0	0
H. Dixon, Smarden	3,969	4	7
Cox Bros.	3,945	0	0
Barden and Head	3,893	10	0
Elmore and Son	3,812	0	0
S. E. Moss and Co., Southend-on-Sea	3,761	17	10
J. A. Davison, West Malling	3,737	0	0
D. Godden and Son, Hamstreet	3,731	2	9
C. E. Skinner,* Chatham	3,540	0	0

Rest of Maidstone.

*Provisionally accepted.

(*Tenders continued on page viii.*)

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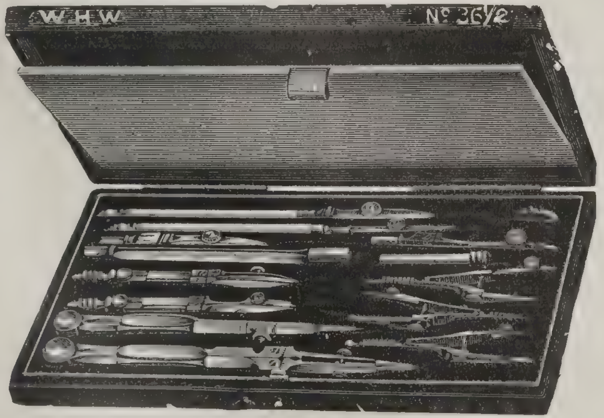

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(Tenders continued from page vi.)

London, S.W.—For the making up and paving of Clairview Road, Streatham, for the Wandsworth Borough Council. Mr. P. Dodd, borough engineer:—

S. Lane and Co.	£1,290	0	0
A. L. Etheridge	1,269	9	0
J. Mowlem and Co., Ltd.	1,240	0	0
Potter and Co.	1,200	0	0
S. Kavanagh and Co.	1,188	0	0
E. and E. Iles	1,154	0	0
T. Adams	1,153	0	0
E. Parry and Co.	1,101	0	0
Harringdon and Co.	1,080	0	0
R. Dykes*	1,070	0	0

Borough engineer's estimate, £1,102 19s. 11d.

*Recommended for acceptance.

Pontllanfraith (Mon.).—For work at Pontllanfraith Bridge, for the Monmouthshire County Council. Mr. W. Tanner, F.S.I., county surveyor, Newport:—

A. Findlay arnd Co., Motherwell	£1,284	3	7
A. Thorne and Sons, London	1,255	0	0
Orr, Watt and Co., Motherwell	1,198	15	6
H. Smith, Newport	1,183	16	6
R. Blundell and Bevan, Blackwood	1,076	15	9
Isca Foundry Co., Newport	1,064	8	6
Motherwell Bridge Co., Motherwell	1,058	0	0
H. C. Parfitt, Newport	1,049	0	0
J. Charles, Newport	1,035	0	0
R. W. Hunter and Co., Cardiff	1,016	18	1
J. Brownscombe and Son, Newport	999	0	0
Barnes, Chaplin, and Co., Cardiff	985	15	3
R. McNab, Newport	980	0	0
Finch and Co., Chepstow	979	4	4
J. C. Brettell, Worcester	962	7	4
A. S. Morgan and Co., Newport	960	0	0
Cleveland Bridge Co., Darlington	958	14	11
E. Jordan and Son, Newport	944	0	0
R. Pomeroy and Co.,* Cardiff	897	14	10

*Accepted.

Royston (Herts.).—For erection and completion of a new County Council school at Royston (accommodation, 428), for the Hertfordshire County Council. Mr. Urban A. Smith, county surveyor:—

J. Honour and Son, Tring	£6,088	5	11
Gimson and Co., Royston	5,998	5	0
Ekins and Co., Hertford	£5,979	0	0
J. Willmott and Sons, Hitchin	5,966	0	0
W. H. Hinkins and Sons, Royston	5,965	0	1
Shrouder and Matthews, Stevenage	5,856	0	0
General Building Co., Chandos Street, W.C.	5,831	9	5
F. J. Bailey and Co., Ashwell	5,782	4	0
G. Jaggard, Bushey	5,463	16	0
H. J. Linzell, Newmarket	5,430	5	0
P. R. Paul, Waltham Abbey	5,399	0	0
Beardsmore and West, Northampton	5,395	0	0
A. H. Fryd, Southend-on-Sea	5,374	12	8
Bosworth and Lowe, Nottingham	5,357	0	0
Jacklin and Co., Royston	5,300	0	0
G. Henson and Son, Wellingborough	5,158	6	5
F. Hitch, Ware	5,128	0	0
C. Heath, March	5.045	10	0
Hacksley Bros.,* Wellingborough	5,029	0	0

*Accepted.

Stanhope (Durham).—For erection of three stone bridges on the new road from Eastgate to Rookhope, for the Weardale Rural District Council. Mr. G. W. Egglestone, Highway Surveyor, Stanhope:—

A. Hyslop, Derby	£1,669	15	0
J. Lant, Newcastle-on-Tyne	1,356	0	0
G. Dougill and Sons, Aysgarth	1,237	16	3
J. Westgarth, Rookhope	1,163	11	8
G. Westgarth, Wolsingham	1,148	13	6
J. Hopper, Wolsingham	959	8	6
J. J. Reed, Frosterley	806	0	0
J. English,* Cowshill, Wearhead, S.O., Co. Durham	725	9	8
C. Richardson, Stanhope (one bridge only)	662	18	6

*Accepted.

Waddon (Croydon).—For erection of buildings and smiths' and ironfounders' work in connection with the Waddon Waterworks, for the Croydon Town Council:—

Erection of buildings, etc.

Wilkinson and Co., Finsbury Park	£9,467	0	0
Pasterfield and English, Streatham	8,449	0	0
G. H. Denne, Deal	8,345	0	0
Grace and Marsh, Tamworth Road	8,274	0	0
H. Hann, Collier's Wood, Merton	8,214	0	0
G. Everitt, Windmill Road	£8,200	0	0
F. W. Honour, The Green, Warlingham	8,047	10	6
Thomas and Edge, Anglesea Avenue, Woolwich	7,986	0	0
E. J. Saunders, Wellesley Road	7,980	0	0
W. Smith and Sons, London Road	7,958	0	0
Hyde and Co., Norwood Junction	7,922	0	0
J. Smith and Sons, Ltd.,* South Norwood	7,842	0	0
B. E. Nightingale, Albert Embankment	7,780	0	0
F. and G. Foster, Norwood	£7,672	0	0

Smiths' and ironfounders' work.

Hyde and Co., Norwood Junction	1,908	0	0
Howard Bros., Featherstone Street, City Road	1,690	13	5
W. Brettell and Co., Worcester	1,640	0	0
E. J. Saunders, Wellesley Road	1,590	0	0
A. Findlay and Co., Ltd., Motherwell	1,577	4	0
General Iron Foundry Co., Upper Thames Street	1,568	3	0
F. and G. Foster, Norwood Junction	1,516	0	0
J. Abbott and Co., Gateshead-on-Tyne	1,507	7	10
S. Wright, Havelock Street, Leicester	1,485	11	7
G. P. Banbury, Drummond Road	1,449	12	9
Wenham and Waters	1,446	0	0
B. E. Nightingale, Albert Embankment	1,431	0	0
G. Sands and Son, Nottingham	1,417	10	0
F. W. Cross and Co., Park Street, Walsall	1,406	5	0
Peirson and Co., St. Dunstan's Hill	1,410	11	2
E. F. Blakeley and Co., Liverpool	1,361	15	0
H. Miller, Freezywater, Waltham Cross	1,334	0	0
Gibbons Bros., Dibdale Works, Dudley	1,332	17	0
E. C. and J. Keay, Ltd., Birmingham	1,328	0	0
Clyde Structural Iron Co., Glasgow	1,262	0	5
Lambourne and Co., Piccadilly, Manchester	1,260	0	0
Goddard and Massey, Ltd.,* Nottingham	1,257	18	9

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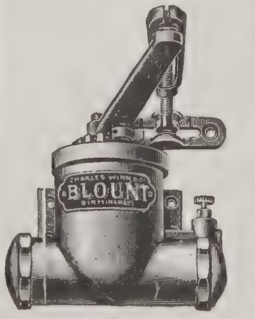

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October 13, 1909. Volume 30, No. 766.

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

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Profession and Practice.

Practical engineering problems, and those that are left to the architect to solve, being often so very closely akin, it is by no means astonishing to find, from a paper on "The Status of the Engineering Profession," recently read by Mr. G. Allan Thomas before the Society of Engineers, that the present discontents of both professions are virtually identical. It might, for example, be stated of either profession that it is overcrowded, and that in each case the plethora is due to the constant influx of men lacking sufficient scientific training, who have no great love for their work, but are apparently tempted by the ease with which a footing may be gained. Then there is the misuse of the term engineer by unauthorised persons. Is there not a similar abuse of the term architect? All sorts and conditions of men may, without let or hindrance, describe themselves as architects, and there is unfortunately no room for doubt that they can, and do, with impunity bring discredit on the name. Another topic dealt with by Mr. Thomas was the multiplication of societies. Here his principal grievance seemed to be that members "use the initials of societies other than the three principal institutions as a distinguishing mark." In the architectural world there has been observed, it is true, a tendency towards multiplication by cleavage; but among the engineers the separate institutions seem to spring into being spontaneously and independently, because engineering comprehends a large number of various interests and occupations, which naturally demand sub-division and distinct classification, although they do not appear to justify an equivalent misuse of assorted selections from the alphabet. Further, the author finds it necessary to declare that "no professional man should be allowed to advertise." He does not explain why. Nobody ever ventures on to such delicate ground. One feels that it is unprofessional and undignified to advertise, and there the matter rests. Finally, there is the question of fees. "In the absence of any legal status," says Mr. Thomas, "it is difficult to establish a scale of fees, and so to prevent cutting of prices." But the many and flagrant infringements of the R.I.B.A. scale show that to establish a scale and to enforce it are different matters. Architects are occasionally invited to compete against each other in the matter of fees, as in the following instance: "Architects are invited to send in their terms for preparing plans, working drawings, specifications, bills of quantities, etc., and for superintending the carrying out the erection of a proposed new school at ——. The commission must include the preparation of the necessary plans and specification for the Board of Education, the Local Government Board, the Education Committee, the builder and clerk of works, and must be finally approved of by the Board of Education and Local Government Board; also copies of the bills of quantities for the builders tendering for the works. No commission will be allowed on furniture to be supplied to the schools." The lowest bid was $2\frac{1}{2}$ per cent. on the cost. Two competitors thought this remuneration adequate; the gentleman whose offer was accepted presented excellent credentials, and stated, we are informed, that his charge included travelling expenses. One competitor thought the work worth $6\frac{1}{2}$ per cent.; another 6; three others, 5; one, rather curiously, $4\frac{3}{4}$; and there were two at $4\frac{1}{2}$, three at 4, and one at $3\frac{1}{2}$, or, alternately, at $2\frac{1}{2}$ if the cost exceeded £5,000. This seems to suggest that the scale of fees established by the R.I.B.A. is but little better than a pious aspiration; and, further, that professional organisations, whether of engineers or of architects, might do worse than borrow a lesson or two in discipline from the much-despised trade unions, which at least have the courage to enforce the rules that they see fit to make.

Decorative Ideals.

A strong and fearless idealist is invaluable to his day and generation. His contentions — or, rather, his dogmatic assertions—may seem to be for the moment visionary, and incapable of being translated into practice; but if they are in fact a revelation of the means of betterment, as well as a counsel of perfection, the idealist does not demonstrate and exhort in vain. Always providing he has earned the right to preach, and can do it eloquently, he is sure of attentive listeners, some of whom will gladly embrace his gospel. Such a preacher is Sir William Richmond. He is, on his record, fully entitled to lecture us, and he has, in his time, cleared both the physical and the spiritual atmosphere of much obscuring and injurious smoke. The National Association of Master House Painters and Decorators were no doubt proud to have him among them at their convention at Sheffield the other day, for is he not a "brother brush"? and, on the whole, he said but little that could have made them feel poignantly sorry for their sins. On the other hand, his advocacy of simplicity and paint—and plenty of both—must have touched a sympathetic chord in their hearts. His suggestion of "a long settee, made of pine, painted an agreeable colour, and furnished with a mattress and plenty of cushions," probably evoked applause; but they must have felt a little dubious about the profitableness of his eloquent eulogy of lime-whited walls. "Both photographs and prints tell best on a white wall. . . . On the whole, the most effective, the healthiest, and the pleasantest room to live in is a white room. There is no white so pure as lime; no product is so successful in the slaughter of offensive animal matter. Lime is cheap and efficient. Every coloured object, save dark ones in large masses, looks well upon white, which, in my opinion, is the safest of all tints to use in large quantities." But whitewash, and plenty of it, does not comprise the whole art and duty of the decorator. "A very little ornament, skilfully applied in pale and quiet tints, will look beautiful on a white ground." White walls, moreover, are "exhilarating to the nerves, and are a constant æsthetic companion." Do white walls show the dirt? So much the better. You will be the more likely to clean it away! Sir William's peroration was worthy of Ruskin: "You must combine together, not to aid and abet the vulgar elements in a commercial age, but to emancipate it from further degeneracy by being apostles of rich imagination" (here we try very hard to forget the whitewash), "and of cultivated experiences, who, having learned the great lessons which are the foundations of all good art—reserve without pedantry, beauty without sensuality, gaiety without affectation, simplicity without prudery—will surely win." But, unfortunately, the apostles of rich imagination have to emancipate from further degeneracy "the middle class of town-bred folk . . . whose egotism is a faculty," and who are "self-sufficient, self-occupied, and inelastic." Their æsthetic sins are as scarlet. Would whitewashing suffice them?

Competitions Again.

We draw attention to the particulars, in our list of "Competitions Open," of the competition for the best plan and specification for a farmhouse and outbuildings, to cost about £400, instituted by the Pembrokeshire Small Holdings and Allotments Committee. In the ordinary way the architect's fees for such a work would amount to at least £20; and if the job was not proceeded with he would be entitled to the sum of £10. But the committee offer the munificent sum of £5 5s., and the plan and specification are to become their absolute property. From this one may presumably infer that the committee have no intention of paying the successful architect more than the sum mentioned, or of employing him to carry out the work at his usual and proper remuneration. Further, it is not only possible but rather probable that the committee intend to duplicate these buildings for all holdings in their jurisdiction for which they are suitable, and this without any further remuneration to their designer. It should also be mentioned that the selection of the best plan and specification "shall rest solely with the Council." It is perhaps only kind to assume that the committee are instituting their first competition, and that they are unacquainted with the proper conditions for competitions or the scale of fees upon which architects work. Nothing else would explain the preposterous nature of the conditions as they appear to architects. As it is the Pembrokeshire Small Holdings and Allotments Committee are inviting architects to waste their time preparing sets of plans and specifications from which one set will be selected without the aid of an assessor, and for which a payment is to be made 75 per cent. less than the proper fee. Moreover, this same design may be duplicated ad infinitum with no further remuneration to the architect. If the committee persists with the present conditions, the Royal Institute should intervene in no uncertain manner.

Paris By-laws and Outlaws. Paris would appear to be less a paradise than a purgatory for builders; a little of the former, because of the laxity of the by-laws; a great deal of the latter, because of the ferocity of the workmen. A large number of the roads are at present "up," and, according to a newspaper correspondent, "nearly every public square is disfigured by palisades and yards, which almost look as if they were intended to be permanent." A commission of the Municipal Council has shown that many of these erections are entirely unnecessary, and are due to the heedlessness of the contractors. The by-laws seem to be badly in need of revision, since it now seems that a builder may, with impunity, in a crowded street, "erect his scaffolding on the pavement and monopolise its whole breadth without attempting to provide any accommodation for foot-passengers, who are driven into the road among the motors and horses." It seems, however, that for this state of things, the blame is not wholly with the builders, who are the victims of an epidemic of strikes. In Paris, it is almost impossible to fill the places of the strikers. If the contractor gets a few men on the job, the unionists' organ, called, with delightful irony, "Humanite," publishes an announcement that the "chasse aux renards" is open ("renards" being the French equivalent for "blacklegs"), and the result is an immediate siege of the works—not in the way of "peaceful picketing," but after the manner of the most exhilarating traditions of Donnybrook. In order to avoid bloodshed and devastation, the contractor must wait patiently until the strikers think fit to resume operations. "A good instance of the pernicious effects of these strikes," says the Paris correspondent of the "Morning Post," "is given in the case of the Rue Notre Dame de Lorette. For nearly two months this road has been completely blocked, and for about five weeks all work in it has been abandoned. A large hole—about 30 yards long, and 8ft. or 9ft. deep, has been excavated in the centre of it, and this hole takes up not only the whole breadth of the road, but also the space formerly occupied by the pavement, which has been replaced by shaky planks. The purpose of this excavation was the strengthening of the roadway over the Metropolitan Railway with iron girders. Since, however, the men who were placing the girders in position are on strike, nothing can be done. The shopkeepers, who are losing all their business, had made many protests, and it has now been decided to fill up the hole without carrying out any of the proposed work." When the strikers condescend to return to work, this curious game will probably be played all over again. Even when they are not idling, the workmen are apt to render themselves peculiarly obnoxious. "You are doing too much work," said one to another, the other day, and knocked him down. This savage was sentenced to a month's imprisonment; but minor assaults, which are allowed to go unpunished, are so common as to attract but little notice. Altogether the Paris master builder is having a very lively time. More thorough organisation, on the lines of the British Federation, would perhaps be effective in bringing the men to a more reasonable frame of mind. The French workmen, for lack of adequate facilities for meeting their employers in well-ordered conclave, resort to violence as the most effective means of presenting their case and demonstrating their force. On the other hand, the employers are too fond of treating them like waywardly naughty children. The national temperament is so different from ours, that it is questionable whether the adoption of our "fair-and-square" methods of settling disputes would prove effectual; but they might be given a trial, for it is unquestionable that our system of holding properly constituted joint conferences has proved to be a splendid means of education and discipline to both parties.

Essential Unity. In another part of the present issue we print what in effect is an eloquent plea for the unification of building interests. It emphasises to some extent a remark made in a foregoing note on some common discontents of architects and engineers. The component elements of the great industry we represent would find it profitable to draw more closely together, to study each other's interests more sympathetically, to co-ordinate and thus render more effectual their scattered forces, professional, educational, and industrial. Half the mutual jealousies and antagonisms, and most of the deplorable waste of energy, that are only too evidently rife in the building profession and industry, would disappear upon a frank acceptance of the truth that we are members one of another, and of the obvious wisdom of pulling together instead of against each other. In the very striking article to which reference is made, the value of this Journal as a bond of union is generously acknowledged. This is a point upon which we do not wish to lay undue stress; but nevertheless we cannot conceal our satisfaction that the writer of the article in question recognises so frankly the effectiveness of the efforts we are making to secure the objects which both he and we consider to be so eminently desirable. It is our steadfast endeavour to deal with building interests comprehensively rather than sectionally; and in the steady pursuit of this policy we have been successful almost beyond expectation in demonstrating the utility of an organ that is fully representative of the industry as a whole. To the architect, the builder, and the merchant, we afford the means of meeting on common ground, and hence of acquiring a fuller knowledge and a better appreciation of each other's work or product or point of view. All this must make for progress and amelioration. We do not pretend that to bring the various interests into touch with each other is all that is necessary for the consolidation of mutual interests; yet certainly, as the writer of the article so clearly shows, the services that only a fully representative organ can render are of vital importance to that desirable object—constituting, in fact, a cardinal condition precedent to prosperity and progress; and it must be very evident that, within reasonable limits, breadth and comprehensiveness must increase not only its interest, but its strength, utility and influence.

Urban District Urbanities. That the members of urban and district councils have beautiful minds and polished manners is well known to the architects and builders who, for their sins, are occasionally brought under the light and pleasant yoke of these august bodies. Teignmouth Urban District Council appears to be a singularly Chesterfieldian or Grandisonian assembly—a miracle of district urbanity. At a recent meeting, in which sea-front defences, and incidentally the respective powers of the surveyor and the clerk of works were discussed, some extremely delicate and well-turned compliments were exchanged. One polite member said to another, "You are a vindictive individual." This, though neat, was apparently less exquisitely refined than certain compliments with which the same member had been loaded at previous meetings; for he said, "You told me I was a miserable humbug and a nuisance at every meeting." The credit for these amenities was not denied; and the author of the verbal caresses showed that he had not exhausted his pearls, nor forgotten his suavity, for while the object of his undisguised admiration was speaking, his constant and consistent admirer amiably observed, "He is a humbug. He is nothing more. Tell the truth about it. You are a prevaricator." The last sentence is so delicately circumlocutory that one half-suspects that it is meant to conceal some subtle innuendo. In the course of the debate, one gentleman remarked directly enough, yet with touching modesty, "We are a set of mugginses and jugginses all the way round." As no one accused *him* of being a prevaricator, it is not for us to challenge the accuracy of his observation. Not that these domestic endearments are any particular concern of ours. We merely call attention to them in the faint hope that they may happen to shed some light on the remarkable growth of taste and refinement of which we hear so much, and on the suave and graceful courtesy with which architects and builders are invariably treated by public bodies. It may be wrong to assume that Teignmouth is quite typical, or that the average member of that body is up to the high standard of the two or three members whose gems of thought we have been delighted to quote from the local newspaper; but it is well to know how we are governed, and such instances, although trivial in themselves, have a cumulative value in helping us to a more thorough appreciation of the wisdom of our councillors, and to more of reverence for the dignity of their office. Heigho!

ARCHITECTURAL TOPICS.

Substance of Presidential Address by Mr. Henry Tanner, F.R.I.B.A., to the Architectural Association, on October 8th.

After introductory remarks expressing his sense of the honour and responsibility of the position to which he had been elected, and a high tribute to his immediate precursor in the chair, to his brother officers, to the Council, and to the permanent staff, Mr. Tanner said that the duties of all honorary officers must have been very heavy before such a well-organised staff had been developed, and he often wondered how the duties of the Architectural Association's President of forty or fifty years ago varied from those which have now to be undertaken. I suppose (he said) the educational branch is the largest item, apart from the fact that the number of members is nearly doubled and the necessary incidental work thereby entailed greatly increased.

Our total membership this year shows a slight decrease, as we have had 132 resignations and losses, as against eighty-four new members, and I am very sorry to say that we have lost by death several old and very valued members—Mr. Gruning, who was so universally respected, probably his name appeared in the bulk of cases during the last few years as arbitrator or third surveyor; Mr. J. W. Penfold and Mr. Cole Adams, former Presidents; and Professor Hulme, who for a long time was a valued member of our lecturing staff—are only a few of those whose loss we have to deplore.

This decline in our membership I attribute to the very long period of depression through which we are at present passing, and which is affecting so very adversely the most important trades in this country, among others the building trade; of course, architecture suffers at the same time.

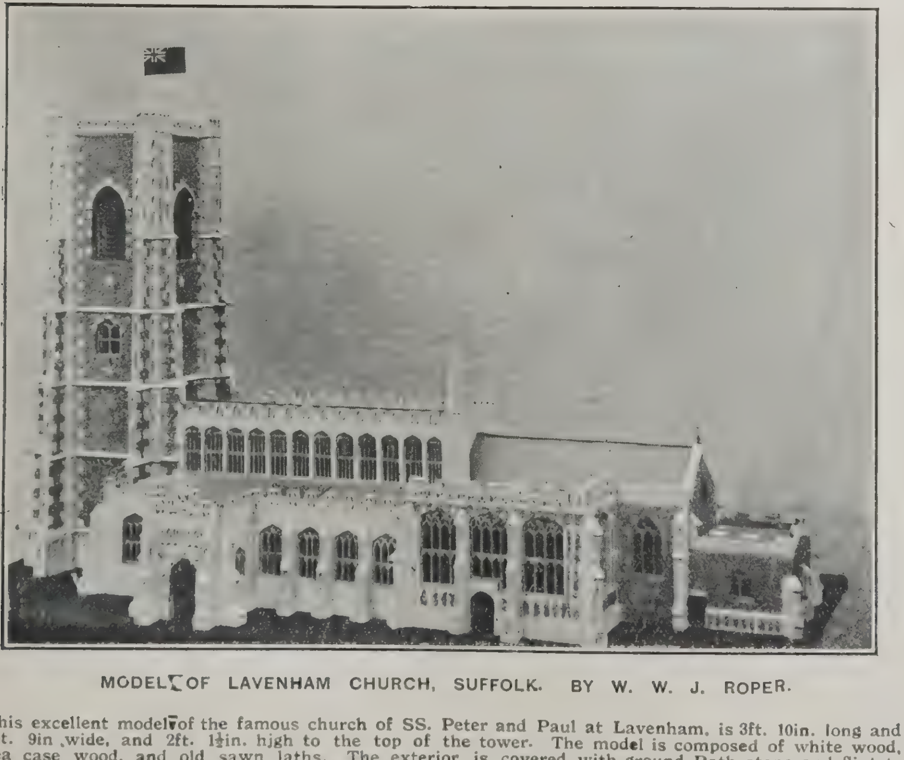
It has occurred to some of us (Mr. Tanner continued) that there is not enough social life in the Architectural Association; that we meet so almost entirely in working hours, and consequently so seldom in moments of leisure, that the men of various decades do not get to know one another, and we should like to see more of the men who no longer wish to come here to study. We are thinking of flattering the Royal Institute in the sincerest form, i.e., imitation, by copying—on a smaller scale, of course—the "At Homes" which have proved so successful with the senior body.

Of the many branches of the Architectural Association, the educational is, of course, the most important, in fact, the whole organisation is being run more and more with this department in view as the main object. Since our school was started, more have sprung up in every direction, and I see that one is now being started in Birmingham, and when there are enough schools to educate the majority of those seeking an architectural training, which time rapidly approaches, I imagine there will be ample support to the proposition put forward in the papers a short time back, of a Diploma course in architecture, and over which there was a great amount of discussion; the different schools naturally shape their studies on varying lines.

Our students' exhibition of work this year was a very good one, a general level of excellence being maintained, which always speaks well for both masters and students. Mr. Maule, Mr. Varndell, and all the other masters work most conscientiously for the welfare of the students, who in turn must, I am sure, ably second their efforts to produce some of the work we have seen, and I am confident that in our two years of day school study, and two of evening school, the students receive a very valuable and sound grounding in their work, which must be most useful to them in after life; but there is no doubt that our curriculum could with great advantage be followed up and amplified by the course of higher studies, which cannot be embraced in the short time at our disposal here.

The Camera and Sketching Club is a flourishing department of the Architectural Association, and the collection of slides, now numbering 4,000, contains examples of almost every style of architecture, and is of the utmost value to lecturers and readers of papers, and I venture to think there are very few subjects connected with our profession which could not be illustrated, to some extent, from the collection.

Remarking upon the success of the Athletic Club, which now numbers more than 200 members, Mr. Tanner said that he hoped to start a golf section this winter, and as the game has now become so popular, he thought that there would be no difficulty in getting together as good a side as in all the other athletic branches.



MODEL OF LAVENHAM CHURCH, SUFFOLK. BY W. W. J. ROPER.

This excellent model of the famous church of SS. Peter and Paul at Lavenham, is 3ft. 10in. long and 1ft. 9in. wide, and 2ft. 1½in. high to the top of the tower. The model is composed of white wood, tea case wood, and old sawn laths. The exterior is covered with ground Bath stone and flint to resemble the Casterton stone and flint of the original. The tower is built up of 1,073 pieces, and the body of 2,497 pieces of wood, or a total of 3,570, all the woodwork being cut with a hand fretsaw.

Having passed in review all the forms of activity of the Association, Mr. Tanner turned to the happenings of general architectural interest during the past year. Among these the Housing and Town Planning Bill is one of which we were led to expect a great deal of good, but the more recent legislation which is being framed with regard to land taxation would seem to have a malevolent influence on the maintenance of open spaces in towns, at any rate, by private people. It would have been much more satisfactory if the disinterested offer of help from the Institute had been received in better part by the authorities in charge of the Bill, for if there is one thing on which the heads of our profession should be consulted it is surely this, and a good architectural result might then be obtained quite compatible with sound engineering requirements and a satisfactory financial result.

The Patents Act has benefited us to some extent, owing to the factories which now have to be put up here by the foreign owners of patents registered in this country which now have to be worked here, but on the whole there is a decided tendency just now to leave building alone until some clear idea is obtained as to the final imposts which land will have to carry.

We are to have further legislation by the London County Council under this year's General Powers Bill, in which the claims of steel as a reliable building material are properly recognised, and it allows the erection of steel-frame buildings throughout, i.e., instead of the thick outer walls formerly required, we may now have thinner panelled walls with steel framing; but, on the other hand, the internal structure is now to be subjected to further supervision, this part of the building being rightly held to be an integral part of the outer shell, whereas with the brick outer shell such was not the case; but a heavy responsibility is being laid on the London County Council and the district surveyors, as they will be answerable for the stability of the new type of building, and I fear some amount of time must be lost in getting plans approved, and time is a factor on which our clients nowadays never fail to lay the greatest stress, and I must say I am inclined to think that taking the responsibility from the architect is a mistake; it means the work being done twice over and taking a large amount of interest out of our work, as the architect should be the author of the entire building, including the structure.

The strides made in ferro-concrete, which is recognised as a subject of future legislation in this Bill, have been prodigious, and though up till recently this type of construction has been utilised chiefly for engineering work, its influence is now being felt in our architecture, and this opens up a very wide question for consideration, for if this medium is going to be, as I think, the one utilised in our larger architectural works, we shall either have to take up the study of this form of construction with its attendant possibilities, or we shall find there will come into existence a ferro-concrete specialist who will take over the general construction of the building, and the architect will be relegated to the decoration of the interior and the design of the exterior.

This raises a point of supreme importance which we are sometimes inclined to overlook, we must design our work to suit modern conditions. It is impossible to insist on the acceptance by the public of the type of work which was suitable even twenty or thirty years ago; we have to face the problem and accept the present conditions and endeavour to treat them architecturally.

I am referring here, of course, to the large commercial buildings in our cities, but in domestic work we have a freer hand, as the habits of life in the home can never change so thoroughly and so quickly as in the world of business. Why should not good architecture be produced with modern materials and to suit modern users? The steel column and beam are accepted facts—why hide them with an arch and a dummy pier? Why should not our constructions be shown in our designs instead of being hidden or obscured as much as possible? There is no doubt that we shall have to evolve a new method of treatment for the modern types of construction unless we are going to be content to let our architecture be a mere shell or screen of stone or whatever material we may elect to use, pegged or hung to the structural members, screening these from view without indicating their underlying form, as should surely be the case.

No one can fail to be struck by the general improvement in the attitude of the public towards town architecture of late years; planning of streets and open spaces has received so much more consideration, and the relation of individual buildings in connection with streets and adjoining work is not now so consistently disregarded. The average Britisher, to borrow a term from the other side, now takes a broader interest in architecture, and his horizon is not bounded by the particular buildings in which he lives or works; and as he educates himself the book opens, he knows the good from the bad, and begins to appreciate the former, and thereby creates a demand for that which we have to educate ourselves to supply.

With reference to domestic work, we have many men carrying on that high tradition in architecture for which England is justly famous, and I think we may congratulate ourselves in attaining a very high general standard at the present time; the public will not have the house which satisfied them a few years back, so even the speculating builder has to produce houses more consistent with the accepted canons of art than those he formerly flaunted in our faces. In this connection I should advocate the assistance, but not the entire control, of the woman in architecture, for I feel sure that the wider architectural field is not one for which the woman is particularly adapted, but in domestic work she would be a very valuable ally.

As to registration, I myself am in favour of it. Of course no scheme of registration can elevate the art of architecture; but it seems to me that it certainly cannot do it any damage, and incidentally is sure to eliminate some of the undesirable, and might put us on a better recognised footing; but before we can be better we must be worse in such an all-embracing scheme as it must be to become law. Many self-styled architects must be included in the roll, but that is or should be the end of this class except so far as the public care to trust any unqualified man when they know that qualifications are essential. Before we can get satisfactory registration we must become a united body, and the advocates of the extreme views must moderate them. But one thing is quite certain, the movement cannot be rushed as one party at the moment seem to desire, as no Bill would stand a chance of becoming law if opposed by any considerable section of the same profession as the promoters; but I venture to think that the anti-registrationists are lessening in number, and I feel sure that they, being mostly in the forefront of the profession, will not stand in the way of a movement that so many think would improve our lot, although they themselves have succeeded in spite of the present position of affairs. There is, to my mind, one most essential factor, and that is loyalty to the central body—I mean the Institute. If this point was now generally realised the advantages to the profession would be immense; until nearly, if not all, architects belong to the Institute, the Institute in turn cannot put forward its views as those of the profession at large, and those architects in favour of the movement who refrain from supporting the central body are only weakening the cause of registration, and not advancing it.

I have often wondered lately if the brilliant draughtsmanship of the day, unless carefully guarded against by the student himself, may not have a derogatory influence on design; a too fluent pen or pencil is liable to run away with the happy possessor, though at times I admit he is wont to rise to far higher flights of fancy than the man less gifted in this way; but the product of the literary man's pen is his finished work, while the drawings of an architect are only means to an end, a step towards the building itself, and what looks well on paper, when drawn as well as some of you can, is liable to be misleading and less satisfactory in actual execution; therefore I would say, do not be satisfied with designing on paper without knowing the value in actual concrete form of the lines you put down, and the only way to know this is to take every opportunity of observing in actual work the value of different treatments, groupings or mouldings, and imagine how you would represent them on paper.

I noticed recently in one of our periodicals [it must have been in the 'Builders' Journal," p. 142, August 25], a short article on London as seen from the trams, of which I believe there are about 400 miles, in which the author remarked what a good knowledge of our city could be obtained in this way, and what a valuable asset that knowledge was. How true this is, and how little most of us know of this big city in which we live, when you consider that you can now ride on 'bus or tram, from east to west or north to south, over the 117 square miles covered with buildings in the Administrative County; you can imagine what a panorama of architecture and building is spread before you, an open book seldom read through; but study every page, good, bad, and indifferent, sum up and analyse every example before you, find out why a building strikes you as good; is it mass, colour, detail, or some fresh note in composition which has been struck? Consider even the works which do not impress you favourably; there is something good in most of them. I would say, criticise kindly, look for the good in all and not the bad, hesitate to say to yourselves how much better you would have done it; you never know the limitations, the troubles, the laws, the bylaws, the client's requirements with which the man who was responsible was hampered, and whether under similar circumstances your own work would have compared so favourably with it as you are inclined to think.

The difficulties that beset the path in actual practice, especially in large towns, are legion, quite apart from the matter of design, but these special requirements are increasing every day, and they must all be known to us before we can give of our best, for they will probably affect our designs very considerably; but if we strive earnestly to do the best that we can in every case, even though others at first seem too far ahead, in the end the earnest worker always gets his reward. One form of genius has been described as "an infinite capacity for taking pains," and the man of that type is never far from the winning-post at the end of the race.

Discussion.

Mr. Walter Cave, the retiring president, in proposing a vote of thanks, observed that the honour which had been conferred upon Mr. Tanner was thoroughly deserved. For many years Mr. Tanner had been actively connected with the Architectural Association, and his record was surely one to be proud of. Only those whose task it had been to deliver a presidential address could judge of the many difficulties to be encountered. Mr. Tanner, in spite of the very serious depression he had had to record, had delivered himself admirably of the somewhat onerous duty. The serious and dominant note of the address was that of finance. For years past they had been accustomed to think of the Association more than paying its way; he could, therefore, only attribute the present financial trouble to the unsettled condition of the times. He hoped that if retrenchments were to be made, the teaching staff would be in no way affected. He sadly noted a deficit in regard to the A.A. play. He hoped that in future, should the feature be continued, something a little less elaborate would be attempted. With very great pleasure he proposed the vote of thanks.

Sir Aston Webb, in seconding the vote, remarked that Mr. Tanner's long and extensive experience had marked him out for the honourable position of president of the Architectural Association. It was a matter of some gratification for him and Sir Henry Tanner to contemplate their respective sons taking so large an interest in the work of the Association. Mr. Tanner having been trained in his office, it was a great delight to witness his success. In the prize list he had noticed a number of names famous in the annals of modern architecture—doubtless, the younger generation following in the profession of their fathers. This would seem to argue that, after all, architecture was not exactly the hopeless thing it was represented to be. In one respect he failed to lament the decrease of membership. The profession was already enormously overcrowded, and any sign of relaxation, although perhaps detrimental to the finances of the Association, should be greeted not with lamentation but with joy. The sister arts were not so closely associated as he would wish. The Royal Academy, he felt sure, would be willing to greet any overtures for a greater intimacy with encouragement. Regarding the papers that were an important feature of the A.A. programme, he sadly regretted the meagre attendance. Perhaps, if the papers were condensed a little, and a larger amount of time were devoted to discussion, their popularity would increase. He hoped the A.A. would never lose its youthful character. It was essentially an institution for expanding youth. He heartily seconded the vote of thanks.

Mr. W. H. Seth-Smith, and Mr. J. Osborne Smith, having supported the vote of thanks, Mr. Tanner replied, and the meeting terminated.

THE GUILDHALL, LONDON.

The London Guildhall is undergoing thorough cleansing and renovation, and many of its quaint beauties which have been hidden for years are now disclosed to view. Grime and soot have lain heavily on the interior mouldings, but now their real character may be observed. The walls, which were once supposed to be of Purbeck, but are now declared to be built of Godstone stone, have been washed down to the marks which are supposed to be connected with the Great Fire of 1666. It has been known that such marks existed, but they have not been visible for 30 or 40 years. In the course of the cleaning an interesting old porch entrance to the crypt which has remained boarded up for half a century has been opened. The crypt itself, which dates from 1411, has also been improved by the scouring of the vaultings and the distribution of electric light in such a way as to give the necessary illumination without interfering with a proper view of the lines of the masonry.

With respect to the recently discovered windows at the Guildhall, described and illustrated in our issue for Sept. 29th, it is pointed out that the discovery was by no means "accidental." The windows were traced in consequence of the appearance of the exposed masonry, and, from first to last, there was nothing accidental about it.

To provide further needed accommodation the City Lands Committee are proposing to erect over the one storey building on the east side of the porch of the Guildhall three more floors of offices. This addition would have the welcome effect of restoring the symmetry and balance of the front as originally built by Dance. It will be recollected that the east side was taken down by the late Sir Horace Jones when he built the library.

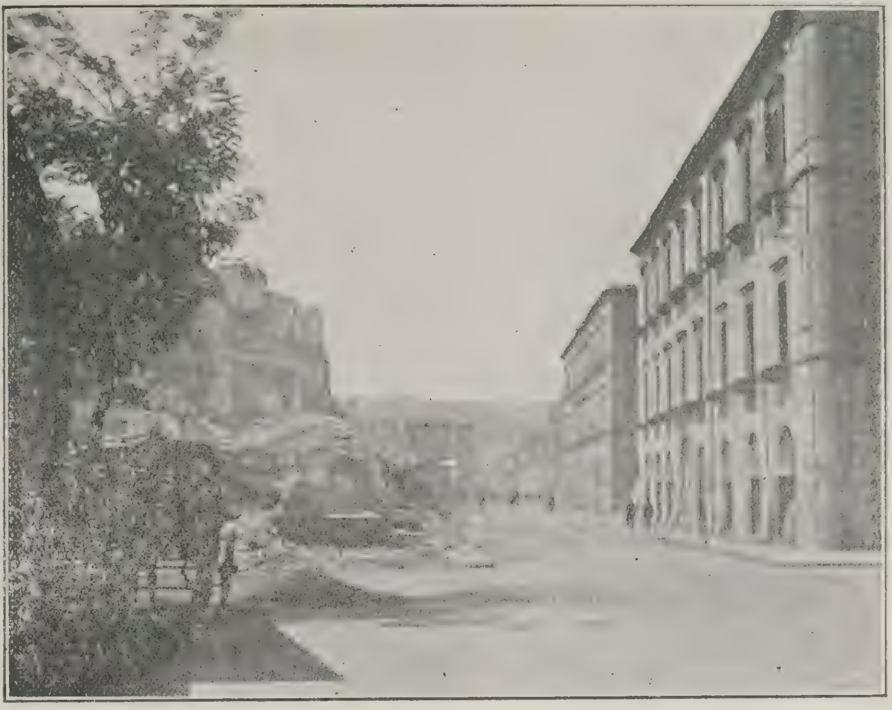
A Bradford journal is congratulating that city on the fact that the sandstone of which Bradford is built resists the action of the atmosphere in smoky cities. The stone blackens, but it does not rot under the acid influence.

STRUCTURAL LESSONS FROM MESSINA.

By A. G. H. Thatcher.

Messina is a ruin, not with the mellowed raggedness of natural decay, but with the rasping jaggedness of devastation. The collapse is complete, but it is as yet too early to say whether or not it is final. On several occasions a similar fate has overtaken the city, and phœnix-like she has risen upon the ruins of her old foundations. The probability is, however, that the city will be re-erected, perhaps in time to be again overtaken with similar disasters. To what extent history will be repeated will depend largely upon the lessons learned from the recent disaster, and on the extent to which practical effect is given to them.

That the city cannot easily be moved away from its present situation is self-evident. Its situation as a port will be a factor against any such proposition, although a difference of a few miles, by removing the town from the particular earth strata upon which it now stands, would introduce an element of greater safety.



MESSINA: A GENERAL VIEW OF A CLEARED STREET.
The houses on the left have been finally demolished by gunpowder, and those on the right are to follow.

A reference to the map, p. 280, will give an idea of the general plan of the town and its surroundings. So far as consideration has been given to the replanning, a suggestion has been put forward that the block of property between the Corso Vittoria Emanuele, which forms the quay side of the city, and the Via Garibaldi shall be entirely removed so as to give increased width to the sea frontage. Some modifications were, however, made to this idea, and the modifications have again been remodified. So that no detail can be considered settled. One might almost say that this method of procedure is in accord with the southern temperament, except that such forthcomings are not unknown even in more northerly latitudes.

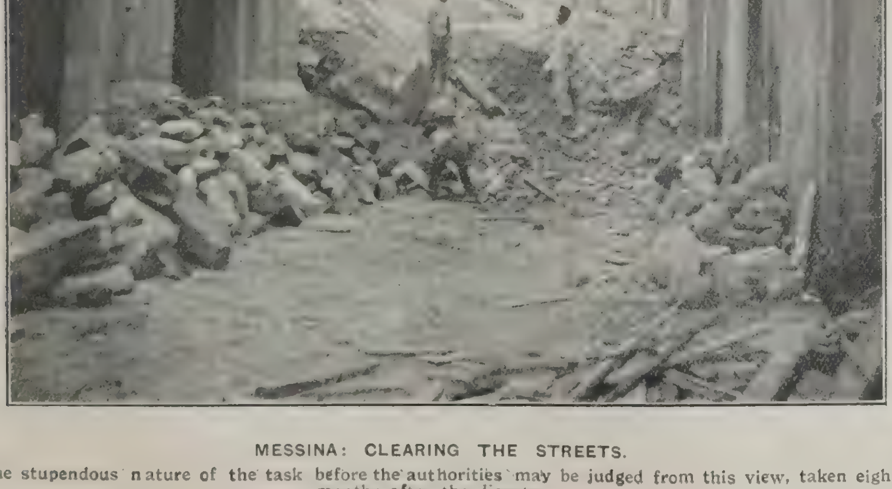
Of the principal buildings, the majority are in absolute ruin. The Cathedral (figured 1 on square E4) has only the wall standing. It is now, in view of the relics of antiquarian and other value on the premises, in the hands of the Government officials and closely guarded. Much of the material will doubtless be of use in the restoration, and it will doubtless ultimately present much of its former appearance. Of the churches, the St. Andrea Avellino, 2, E2, St. Anna 3, E4; St. Annunziato dei Catalani 4, E4; St. Annunziato dei Teatini 5, E3; St. Maddalena 9 E5; St. Maria del Carmine 10, E4; and St. Mecolo 12, E3, are quite destroyed.

St. Francesco d'Assisi 6, E2; St. Gracchino 7, E3; and St. Gregorio 8, E3, are less badly damaged, and the St. Maria della Scala 11, E2, is in still better order.

The Palazzo Brunaccini 15, E4, and Palazzo Municipale 16, F3; will have to be rebuilt if so desired in their entirety, and the Palazzo Reale 17, E2 is in little better condition. The post and telegraph offices and the University have also suffered severely. The ordinary dwelling houses present many aspects. With some the outer walls of a block have fallen. In other instances the opposite has occurred, the walls standing in a dilapidated condition with the interior gutted.

Practically none are habitable. That part of population which is left in the place are by now receiving the full benefits of the moneys subscribed for their assistance. The black squares, p. 279, show the location of the new town which in appearance suggests a mining village of mushroom growth. The houses, or more correctly, huts, consist of two rooms only, with in some instances a small scullery attached. They are entirely detached, built of matchboarding and timbers and stand upon a brick foundation, as shown on p. 284. The huts are not tied down to the brickwork in any way, the theory being that in the event of another shock, less damage is likely to be done if no such connection exists. The same principle is used in the construction of the new hotel p. 283. Owing to the difficulty of using the camera only part of the front and one wing of this building is shown. This difficulty was experienced with many of the photos taken, giving in some cases a somewhat erratic perspective. A temporary school and church house is also nearing completion, but a slight difference is noticed in its construction. The brick foundations in this case are not continuous round the building, but brick piers only are built, about 2ft. above the ground, at all angles to the walls of the building, and at suitable distances apart. The framework of the structure is carried upon timber plates running from pier to pier. As will be seen later the idea of having no connection between the structure and the foundations coincides with the theory put forward by Mr. W. W. Beaumont at a meeting of the Institution of Civil Engineers on December 22, 1885; that one system of building in earthquake countries was a method which would allow the structure to move a little.

The new town is divided into two sections on the south, being known as the American and Italian quarters. The streets are laid out regularly, and a general appearance of neatness is observable at present. The sanitary arrangements are necessarily primitive, and considerable care will have to be exercised to keep the same in good order. Cleanliness in fact is imperative, and will demand particular attention, especially as



MESSINA: CLEARING THE STREETS.
The stupendous nature of the task before the authorities may be judged from this view, taken eight months after the disaster.

the population is not of the higher social scale, and in addition, of course, street paving does not exist. On p. 282 is a typical view of a street in the Italian quarter.

A few more substantial buildings are being put up in the cleared portions of the town, chiefly by the Italians. On p. 284 is an illustration of an example in brick with the upper part cemented over. No attempt is as yet being made to carry brick structures more than one floor high.

The work of clearing the town is proceeding apace. The immensity of the task will be understood when it is known that only two houses in the town successfully stood the shock. On p. 283 is a view of the Villina Lanzara, one of the fortunate pair. The photo was taken from the bottom of a slope, and is therefore somewhat out of perspective, but it will be seen that the house is of particularly solid construction, being largely of Syracuse stone on lava stone footings carried 3ft. above the ground level. A few slight cracks developed during the disaster, but were ignorable when considering the stability of the house. It was of two floors only, and, in proportion to its height, of considerable area. The upper windows are of arched construction, which it will be shown later appears to be a method particularly useful in earthquake countries.

The cross hatching on diagram p. 281, shows the part of the town to a large extent yet uncleared. On p. 279 is an ordinary scene in that district at present. The gangs work in small parties, each being watched by an armed guard. Such material as may be useful is sorted out, and the remainder is removed in trucks on light rails and shot into the sea. Such portions of the buildings as may be left standing are then blown up, and the debris is again sorted over. On p. 279 a street partially cleared is shown, the houses on the left have just suffered from the effects of dynamite, and those on the right which are gutted internally are to follow.

Before considering the different types and methods of building, and how each withstood the shocks, it will be as well perhaps to detail shortly the views upon this subject put forward by Professor Milne and others at a meeting of the Institution of Civil Engineers previously noted. Professor Milne suggests that in the avoidance of destruction it seems that stresses and strains applied horizontally have chiefly to be dealt with, and not so much stresses and strains due to gravity. As an illustration, he considers an ordinary masonry arch. For vertically applied forces this is stable, whilst for horizontally applied forces its stability solely depends upon the adhesion of the material which holds it together. The Professor made many examinations of brick arches that suffered shock in Japan, and found that the effect of the horizontal stress depended chiefly upon the direction of the shock. A crack was found to develop at the crown of the arch when they ran in the direction of the earth movement, but the arches stood when at right angles to this. From this he argues that arches of this description should always be protected by iron or wooden lintels. If arches are indispensable, they should curve into their abutments, and not meet them at an angle, the angle being a point of weakness. This was well borne out by his examination of 330, similarly built brick structures at Tôteiô, where the upper windows had flattish arches, meeting their abutments at an angle. Of 127 cracks in these arches no fewer than 113 ran from the angle. Not a single arch was observed to be cracked at the springing when the arch curved into its abutment.

As another illustration of a structure weak in resisting horizontal forces, the high wall of a factory may be taken, or a church tower which contains a series of openings like windows and doors vertically above each other. These openings may constitute a line of weakness, and the wall may give way here at the time of an earthquake, as was illustrated in Manila in 1880.

The evil effects of overloading the upper part of a structure were also noted in the address. For instance, when a chimney with a heavy top is suddenly moved forward, the upper part by its inertia tends to remain quiescent. The result of this as with all other heavy superstructures is to cause a fracture between the lower part which has been quickly moved and the upper part which has tended to remain still. Weighty tile roofs have the same effect upon supporting walls as heavy tops to chimneys.

In conclusion, Professor Milne says the most important principles to be followed are: First to provide against horizontally applied stresses, secondly to allow all parts of the buildings with different vibrational periods either to have freedom amongst themselves or else to bind them securely together with long steel or iron tie-rods, especially at floors or near corners, as corners of buildings often suffer in earthquakes. Thirdly to avoid heavy superstructures.

The English cemetery is situated on that particular portion of the city which, with its continuation, forms the harbour, being shaped in the form of a sickle. Being thus exposed, the cemetery suffered severely from the effects of the wave which immediately followed the earthquake. The boundary walls were thrown down, and most of the tombstones were lifted and thrown about like so much driftwood. Considerable care has been taken by the British Consul, Mr. Baylis Heynes, to restore the cemetery to some degree of order. The ground has been cleared of wrack and debris, and the boundary walls have been rebuilt, but the tombstones are still in miscellaneous confusion. We believe it is the intention of Mr. Heynes to appeal for a fund to enable the final work to be put in hand. This burial ground was given by Nelson about a century ago.

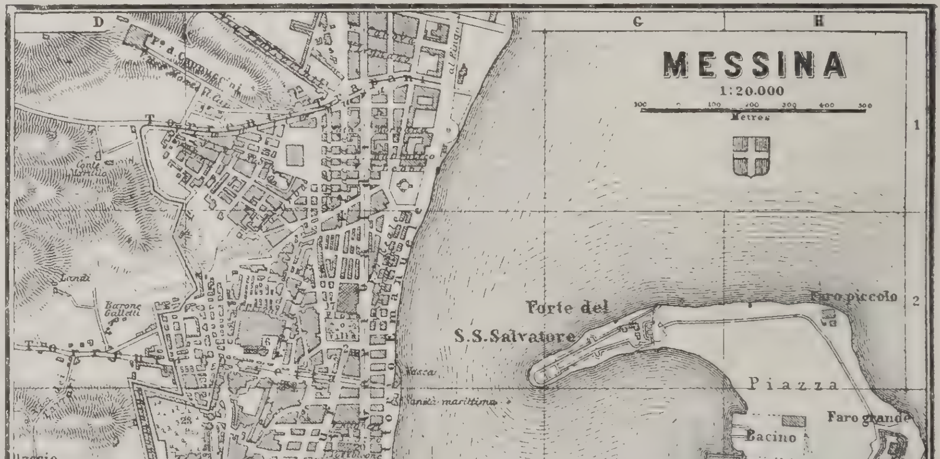
(*To be continued.*)

Proposed New Works.

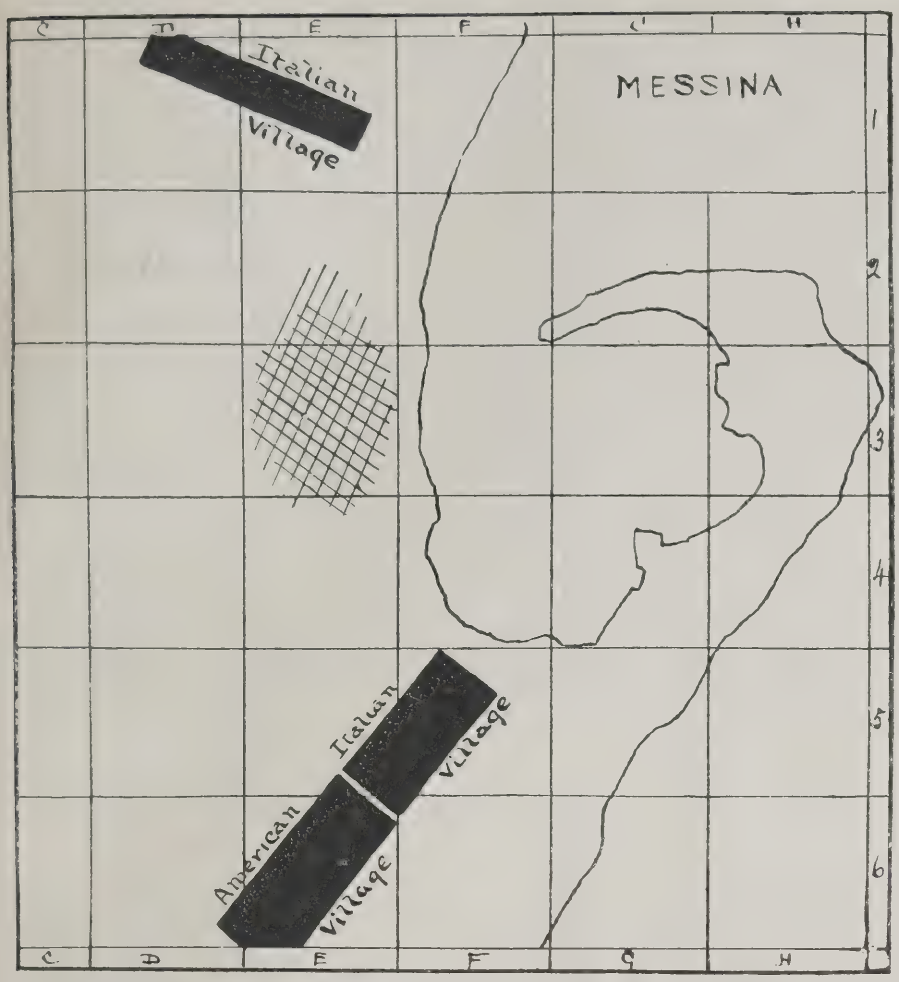
ADLINGTON, NEAR CHORLEY.—A new council school to accommodate 600 scholars and to cost £4,388, is to be built here.

ARBROATH.—In consequence of the inadequacy of the present accommodation for the supplementary classes and the desirability of providing for the special requirements of the evening continuation classes, it is proposed to erect a new school at an estimated cost of £6,000.

ASHTON.—At a meeting of the Elementary Education District Committee it was reported that notice had been received from the Manchester Education Committee, of a proposal to erect a new public elementary school for the accommodation of about 1,000 children, at Moston. Correspondence was presented in reference to the site for a new school at Duke Street, Denton, and also with respect to the negotiations for the purchase



MAP OF MESSINA.



MESSINA; DIAGRAM MAP TO BE COMPARED WITH THAT OPPOSITE.

of land at Droylsden, forming part of the Moravian Estate, as the site for a new school and a public recreation ground. It was decided, in view of the fact that the managers of the Denton and Haughton School have recently incurred considerable expense in improvements, and that a new Council School, which may materially affect the number of children attending, is to be erected, to recommend the Education Committee not to press for further structural alteration at present.

BARNSLEY.—The Church Council connected with St. Mary's, Barnsley, have decided to build a boys' new school at a cost of £4,000. The school has been subject to report by H.M. Inspectors, and the present scheme involves the liquidation of the debt upon the Churchfield site and the utilisation of the present buildings for girls and infants.

BLACKBURN.—A scheme for the provision of a new sanatorium for male consumptives has been approved by the Guardians of the Blackburn Union. It has been decided to convert an old building in the Workhouse district, formerly used as a small-pox hospital, for this purpose.

CHELTENHAM.—A building scheme of some magnitude is projected, involving the development of a large area at Leckington Hill. Plans have been prepared by Messrs. Prothero, Phillott and Barnard, of Cheltenham.

DERBY.—The plans of the proposed new Hippodrome to be erected at the corner of Green Lane and Macklin Street, have again been rejected on the ground that they did not comply with the borough by-laws. Since the plans were previously before the committee numerous modifications have been made, but they still fail to satisfy requirements, the particular by-law under which they have been ruled out being that "without the approval of the Corporation" the height of a building shall not exceed the width of the street it adjoins. The promoters are determined to proceed with the work, recognising, of course, that they will first have still further to revise their plans.

EASINGWOLD.—The North Riding Education Committee have addressed a letter to the Council, advising them that the preliminary arrangements for the provision of a county secondary school and pupil teachers' centre, were being made, and mentioning a number of parishes which the school is to serve.

HUDDERSFIELD.—At a meeting of the Council of the Huddersfield Chamber of Commerce it was stated that the Postmaster-General had written, saying the suggestion that the present Post Office in Northumberland Street should be utilised by various Government departments, and a new Post Office erected on the vacant plot of land opposite, had been considered, but he regretted that it could not be adopted.

IRVINE.—The Dean of Guild Court has passed linings of a new post office for Irvine to be erected by Mr. Gavin Ferguson at 157, High Street, Irvine, on the site of the present Montgomerie Estate Office. The building is estimated to cost about £1,500, and is to be opened at Whitsun.

MEXBOROUGH.—The West Riding Education Authority have intimated that they intend to proceed with the building of the proposed new additional elementary school at Mexborough. The Town Council, however, have decided to recommend to the West Riding Authority that the scheme be delayed for twelve months.

NEWCASTLE.—The probable cost of a new parish hall, which it is proposed to erect here, is £2,000. The Parochial Committees recently met, and approved the plans which have been prepared by Mr. A. B. Plummer, the diocesan architect. The buildings are to be erected on the site to the east of the church.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Oct. 30.	TECHNICAL AND SECONDARY SCHOOL, WORKINGTON. The Cumberland Education Committee invite architects to submit sketch plans with outline specification and estimate for a technical and secondary school in the Borough of Workington, Cumberland, for about 300 pupils of both sexes. Further particulars and conditions upon which plans will be received may be obtained from the undersigned on receipt of a stamped and addressed foolscap envelope and the payment of a deposit of one guinea. Deposit returned if all papers sent are returned within seven days. C. Courtenay Hodgson, Secretary, The Courts, Carlisle.
Oct. 31.	PEMBROKESHIRE SMALL HOLDINGS: Model plan and specification for a farmhouse and outbuildings suitable for a holding of 50 acres, and at a cost of £400 or thereabouts. The following are some of the conditions: (1) The selection of the plan and specification to be adopted shall rest solely with the Council. (2) The Council will be prepared to pay a sum of £5 5s. for the selected plan and specification, which are then to become the absolute property of the Council. (3) If the Council are of opinion that none of the plans are suitable for their purpose they shall not be obliged to make any selection. Plans and specifications to Marshall George, Clerk and Agent, Pembrokeshire Small Holdings and Allotments Committee, Haverfordwest.
Nov. 1.	PRESTON GRAMMAR SCHOOL FOR BOYS. Preston Town Council invite competitive designs and plans from architects practising as principals, for a new grammar school for boys, to be erected in Moor Park Avenue, Preston, and estimates for the same. Premiums of £50, £30, and £20 are offered. The Corporation have appointed a professional assessor. Application to be made to Mr. Alfred Howarth, Town Clerk, Town Hall, Preston, and designs and plans must be sent in by 10 a.m. on Nov. 1.
Nov. 30.	HERNE BAY PAVILION ON PIER. Herne Bay Urban District Council invite competitive drawings for a pavilion to be erected on the proposed extension of the pier at a total cost not exceeding £4,000, exclusive of architect's commission. Premiums of twenty-five guineas and ten guineas. Plan of the site and copy of the conditions may be obtained from J. Jubb, Clerk to the Council, Town Hall, Herne Bay. Deposit: one guinea.
Dec. 18	TRAINING COLLEGE FOR TEACHERS, Kirkstall Grange, Far Headingly. Leeds. Architects practising in Leeds are invited to submit competitive designs for the above College. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed Assessor. Copies of the conditions of competition and instructions, a plan of each floor of the educational blocks and of the hostel blocks, also an estate plan, showing a suggestion for grouping the various buildings may be obtained from James Graham, Secretary for Education, Education Department, Leeds. Designs to be delivered not later than 12 o'clock noon. Deposit: £2 2s.
Jan. 31, 1910.	NATIONAL MUSEUM OF WALES. The Council desires to receive competitive designs for the erection of a new National Museum at Cardiff, Three premiums are offered of £200, £150, and £100, for second, third, and fourth. The Council have appointed Sir Aston Webb, R.A., Mr. John J. Burnet A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A., as Assessors. Particulars and plans of the site will be supplied to competitors on payment of a fee of £2 2s., returnable if all papers are returned within 14 days. Inquiries to be addressed to Dr. Wm. Evans, Hoyle. Director of the Museums. City Hall, Cardiff.

Hamilton New Academy.

The competition for the above has resulted in the selection by the assessor of the plans of Messrs. Cullen, Lochhead and Brown, of Hamilton and Motherwell. The building will cost £35,000.

MESSINA: THE NEW TOWN—ITALIAN QUARTER.

Warrington Elementary School.

We are officially informed that the Competitions Committee of the Royal Institute of British Architects are corresponding with the Warrington authorities with a view to the amendment of the conditions in this competition.

New Council School, Walton-on-Naze.

In the recent competition for designs for this school, the plans submitted by Messrs. Tomkins, Homer and Ley, of Frinton-on-Sea, and 54 and 55, Bishopsgate Street Without, E.C., have been awarded first place, and selected for adoption by the Essex Education Committee. The building will consist of a mixed school to accommodate 352 scholars, with a cookery centre attached.

Whitby Secondary School.

In this competition the assessor selected the design numbered 41, and awarded the premium of 20 guineas to the design numbered 112, and the premiums of 10 guineas to the design number 66. The names of the architects are as follows:—41, Messrs. Thomson and Bristow, 13, Westminster Chambers, Victoria Street, S.W.; 112, Mr. R. W. Owen, 60, Castle Street, Liverpool; 66, Messrs. Oliver, Leeson and Wood, Milburn House, Newcastle-upon-Tyne.

Deptford Branch Library.

Mr. J. S. Gibson has given his award in the above competition. The first place has been awarded to Messrs. Castle and Warren, of Talbot House, Arundel Street, Strand; the second place has been awarded to Messrs. W. F. Young and H. W. Horsley, Norfolk Street, Strand; and the third place to Messrs. Wills and Anderson, Bloomsbury Square.

The Corporation of Glasgow are preparing to celebrate the jubilee of the completion of the scheme for supplying the city with water from Loch Katrine. This great undertaking, which was the pioneer attempt to turn to domestic and commercial use a lakeland 40 miles from the centre of distribution, was opened by Queen Victoria on October 14th, 1859. During the 50 years Loch Katrine works have needed no alterations or improvements of any importance, and they stand today as a monument to the genius of their designer, the late Mr. J. F. Bateman, who, at a banquet in 1860, claimed that they surpassed the greatest of the nine famous aqueducts which fed the city of Rome. The almost limitless resources of the supply will be appreciated when it is stated that the quantity of water drawn from Loch Katrine daily would fill a canal of 30ft. wide and 6ft. deep for 19 miles.

Law Case.

Weights of Brushes: Important Test Case.

In the Birmingham Police Court, a brush manufacturer was summoned at the instance of Thomas Marson Till, 8, Old Jewry, London, secretary of the British Brush Manufacturers' Association, on the charge of having sold brushes that were marked "9ozs.," but were alleged to contain a smaller weight of bristles. The summons was taken out under section 2, paragraph D, of the Merchandise Marks Act. The defendant did not contest the accuracy of the statement that certain brushes particularised by the prosecuting counsel were slightly under weight, but counsel for the defence produced several specimens, all under weight, of brushes made by other manufacturers. "It is," said counsel for the defence, "a common experience in the trade that a nine-ounce brush does not contain nine ounces. The Association want to stop it. This is merely a test case. It is the first case of the kind in this particular trade; and as the defendant has done no more than his fellow-manufacturers have done, I submit that it is a technical offence, and should be dealt with accordingly. I should like to say that we gave the prosecution every possible assistance. I will ask the Bench to bear in mind that the case is simply brought into court with the object of warning the trade that such a custom is not legal, and is not in the best interests of the trade." Counsel for the prosecution demurred to the implication that short weight was a custom of the trade.—The Chairman of the magistrates said: "As this is the first case of the kind brought before the Court, I think that justice will be met by inflicting a small fine of £1, and three guineas costs." Other summonses were withdrawn.

SCHOOL OF ART WOOD-CARVING.

The School of Art Wood-carving, 39, Thurloe Place, South Kensington, has been re-opened after the usual summer vacation, and we are requested to state that some of the free studentships in the evening classes maintained by means of funds granted to the school by the London County Council are vacant. The day classes of the school are held from 10 to 1 and 2 to 5 on five days of the week, and from 10 to 1 on Saturdays. The evening class meets on three evenings a week and on Saturday afternoons. Forms of application for the free studentships, and any further particulars relating to the school, may be obtained from the manager.

THE ESSENTIAL UNITY OF BUILDERS' INTERESTS.

(*Contributed.*)

In Hobson's "Industrial System" in a chapter on "Trades, their place in the Industrial System," occurs the following passage:—

> "The relations between trades are seen on analysis to be vastly complex, and one feels constrained to figure industry as a live organism with something like a common flow of blood and a common system of nerves and an organic co-ordination of parts resting on a complexity of business cells, the whole set of industrial operations being so closely bound together that any touch bestowed at any point may be communicated to the most distant parts."

How true that sounds; and dealing as we do in this Journal with the many phases of one of the largest and most complex of our great industries, it is often borne in upon us how difficult it is to assign to each event its relative importance, to the individual trade or profession concerned and to the industry as a whole. No doubt our readers, especially those who belong to highly specialised branch trades, and perhaps some of those whose interests are of a purely professional kind, find the same difficulty when they come across a series of articles on some special subject such as reinforced-concrete, and failing to fully apprehend the consequences of the introduction of reinforced-concrete construction into our industrial system, and not being directly interested in that kind of construction, feel bored by what seems to them a series of dry technical studies, interesting only to a few specialists who design and erect buildings in that material.

Let them, however, consider the matter in the light of the quotation with which we began this article, and, if possible, go over a few reinforced-concrete buildings, and then try to realise the enormous revolution which is being thus introduced into the building industry, and we shall be surprised if they feel any longer bored.

From the professional side the introduction of ferro-concrete has brought in its train the need for a fresh study of many problems of construction which have been solved hitherto on time honoured lines; fresh calculations, fresh tests, fresh specifications, fresh computations for measurement, fresh methods of applying a satisfactory finish to the surfaces of the huge grey boxlike structure which emerges from the hands of the constructor in reinforced-concrete.

There is no end of fresh points to be studied and thought about and talked over by engineers, architects, surveyors, and their respective staffs, but to do this intelligently they must first study and understand the materials and methods of construction involved in reinforced-concrete, constantly revising and re-adapting their previous knowledge during the process.

From the industrial side the most vital problems are raised by such huge reinforced-concrete buildings as the Post Office extension at St. Martins-le-Grand (and other similar constructions which are springing up in various parts of the country). Here is a huge construction put up and roofed in without the use of common brick, or ashlar stone, or terra cotta for the building of its walls, or of tiles, slates, or sheetlead, or copper, or timber for its roof. Is there nothing for the brick and tile works and workers, the slate and stone quarries and masons, the timber importers and carpenters, the lead merchant, and the pumber to think about in all this?

There is a remarkable development of centering required to carry out reinforced-concrete work with no end of problems to solve, so that the maximum of efficiency, mobility, and economy may be realised. Is there nothing in this to interest the joinering branch?

Reinforced-concrete buildings require finishing externally and internally with some kind of familiar looking material. Here are endless opportunities for the brick and tilemaker, the plasterer, and the marble, granite, and stone quarries to adapt their materials to facing

MESSINA: ONE OF THE TWO HOUSES WHICH SUCCESSFULY WITHSTOOD THE SHOCK.

NOTE.—The condition of the house as shown in this view must be attributed to the camera and not to the earthquake.—EDITOR.

purposes, and to devise improved methods of fixing and securing. Can this be done without studying the conditions of reinforced-concrete construction?

The walls, roofs, floors, cornices, staircases, parapets, and vaults of building are now being done in the new material, and there is every probability that fireproof doors, window frames, mantelpieces, drains, water-tanks, gutters, and down-spouts, and all kinds of run-ways for pipes for water and electric and heating services will be eventually so constructed. What are the various sub-trades going to do about it? Are they going to devise specialities in the new materials to meet the demand, or are they going to allow themselves to be ousted?

Up to the present it only pays to adopt reinforced concrete construction in large buildings of certain types, but how long will that restriction last? If we consider the long rows of identically planned two-storey houses with which the speculative builder delights to cover the land, it is evident that there is an opportunity for the application of the new method to this class of building also. Mr. Edison, at all events, thinks so, since he is devising forms for pouring complete houses into metal moulds. In short, the advent of reinforced-concrete construction is the

Most Revolutionary thing which has happened in Building within living memory

and its coming will upset all existing values and demand endless re-adjustments from the professional side, the industrial side, and the artisan side before a stable condition can be reached. Doubtless, a similar line of investigation would show that every change in constructional methods will have some bearing on the practice of some or all the constituent trades of this industry, and therefore needs scrutinising, and its effect gauging by each one engaged therein. In fact, it should be frankly agreed that

The Building Trade is one industry,

not a series of separate and independent trades occasionally brought together; anything, therefore, affecting constructional engineers, architects, and quantity surveyors will sooner or later affect the general contractor, and what affects the latter will eventually affect the sub-contracting trades, and vice versa. Questions of this kind are constantly being reported on and referred to in our columns, as, for recent example, the question of "Builders' Locked-up Capital," the question of "Engineers and Architects as sole Arbitrator under a Contract," for which they are also acting in their professional capacity, the question of "Tenders being invited by building owners without quantities being supplied by a competent surveyor." By every one of these questions the professional side, the industrial side, and the subcontracting side of the industry is more or less strongly affected.

If we turn to legislative matters

the same thing applies. Whether the questions under consideration are a Housing and Town Planning Bill, a Building and Engineering Works Bill, a Trade Boards Bill, a Labour Exchanges Bill, or an Insurance against Unemployment Bill, every branch of the industry ought to be keenly interested because every branch will be more or less affected by such legislation.

Just as one cannot drop a stone into a pool without producing ripples which, traversing its surface in every direction, rebound in reversed wavelets from the circumscribing shores, so one cannot interfere with any part of a great modern industry without setting in motion waves of transmitted effects, whose extent and results can only be foreseen and guarded against by those professional and trade organisations which have realised the essential unity of the interests of every member of the industry, be he in a large or in a small way of business, be he engineer, architect, surveyor, general contractor, or sub-contractor, and are prepared by cooperation for common objects, and mutual concession in regard to separate objects to promote the general welfare of the whole.

[It is the aim and object of this Journal to inform, aid, guard, and promote the best interests alike of the whole and of the parts of the building industry, by giving accurate information on all new developments, by calling attention to abuses and suggesting remedies, and by voicing the opinion and wishes of its various parts; and in doing so it is entirely animated and guided by that general conception of the essential unity of the industry to which reference has been made. —EDITOR.]

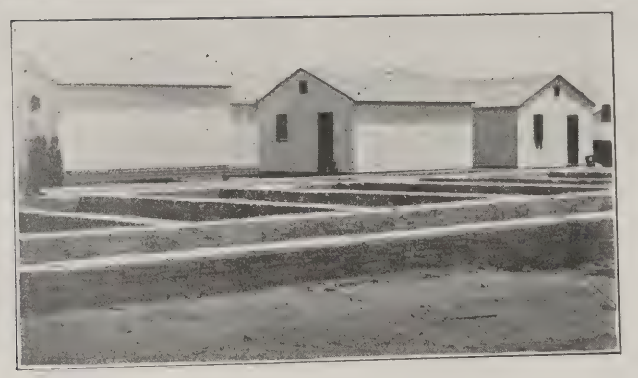
Works in Progress and Completed.

BRADFORD.—The opening ceremony in connection with Bradford Town Hall extension, which has been carried out at a cost of £85,000, took place recently.

LONDON, S.W.—The new extension to the L.C.C. School of Building, Ferndale Road, Clapham, has just been opened. The hall is capable of seating 3,000 people.

MAIDENHEAD. — The new secondary school for boys at Maidenhead for the Berkshire County Council, is now nearing completion, the buildings being completely roofed in. The school is designed on the corridor system, and is from the designs prepared by Mr. A. Jessop Hardwick, F.R.I.B.A., and selected in open competition. A master's house is also being built in connection with the school. The builder is Mr. J. B. Seward, of Wokingham.

MESSINA: THE PRINCIPAL NEW HOTEL.



MESSINA: THE NEW HUTS, SHOWING THE INDEPENDENT BRICK FOUNDATIONS.

NEWBURY.—The new secondary school for girls at Newbury for the Berkshire County Council is progressing rapidly, the steelwork for the fireproof floor now being fixed. The building is estimated to cost £8,728, and is planned on the corridor system, with a large assembly hall on the first floor. The architect is Mr. A. Jessop Hardwick, F.R.I.B.A., and the contractor Mr. J. B. Seward, of Wokingham.

OXFORD.—To meet the increasing needs of accommodation for the parishioners of Summertown, the northern suburb of Oxford, a church called St. Michael and All Angels is being built in Lonsdale Road, which, when completed, will provide sittings for about 1,000 persons at an estimated cost of about £13,000. The portion erected consists of chancel, north and south transepts, lady chapel, and one bay of the nave, affording seats for about 600. The building when finished will be 133ft. in length, and will be the largest parish church in Oxford.

PONTARDULAIS.—The chapel which has just been completed for the Presbyterian sect, was designed by Mr. W. B. Rees, of Cardiff, and has been built by Messrs. A. and A. Thomas of this town.

SOUTH SHIELDS.—The German Sailors' Home, which has just been opened, has been erected at a cost of about £8,000, the general contractors for the work being Messrs. Robert Neill and Sons, of Manchester, and the architects Messrs. Liddle and Browne, of Newcastle.

STOWMARKET.—The new secondary school which has just been opened, has involved an expenditure of about £5,000. The architect is Mr. T. E. Key, of Aldeburgh, and 45, Bloomsbury Square, and the builder Mr. A. Gayford, of Trinity Works, Ipswich.

STARBECK.—The new church of St. Andrew, now in course of erection, is to seat about 600 people. The cost is estimated at £6,000. Messrs. Austin and Paley are the architects.

SUDBURY.—The estimated cost of a new Roman Catholic school which was opened here recently is £860. Accommodation for about fifty scholars is provided in the new building.

TREORCHY.—A new church building, which has just been opened, forms part of a scheme which has been initiated by the Welsh Baptist Church, at an estimated cost of over £6,000. The architect was Mr. T. D. Thomas, of the firm of Messrs. W. D. Morgan, Pentre, and the contractor was Mr. Gwynne Edwards, of Treorchy.

WIMBLEDON.—The new church of St. Andrew, which was recently opened here, is built of red brick with stone facings, and is in Gothic style. The church, which is complete with the exception of the side chapel, provides seating accommodation for 620 people, and has involved a total outlay of £8,026. The architect is Mr. W. T. Lowdell, John Street, Bedford Row.

YARMOUTH.—The new harbour offices which have just been opened are the design of Messrs. Olley and Haward, architects, of Great Yarmouth. The work has been carried out mainly by Messrs. Carter and Wright, of Dene Side, Great Yarmouth.

Our Plate.

Proposed House, Halifax.

This house is proposed to be built of local millstone grit-stone, walled in random courses, and the roofs covered with local "self-faced" stone slates. As far as possible stones having natural red iron-stained faces will be used, with the object of getting as much variation in colour as possible. The windows will be of leaded lights and metal casements. Messrs. Joseph F. Walsh, F.S.I., and Graham Nicholas, F.R.I.B.A., of Halifax, are the architects.

Notes and News.

It was stated the other day that the interior of the chapel at the Fulbourn (Cambs.) Asylum had probably not been redecorated for thirty-five years. The work is now to be done at an estimated cost of £175.

* * *

The Southport Water Board have entrusted the firm of Messrs. Parker and Sharp, contractors, York, with the complete erection of their new Bickerstaffe pumping station, powerhouse, office, cottage, and boundary wall amounting to a little over £17,000. Messrs. H. Rofe and Son, C.E., of Westminster, are the engineers.

* * *

The dispute between the Paris building contractors and the Paris masons over the question of piece work, which resulted in a general strike temporarily paralysing the sequence of the arbitration of the Society of French Architects, who have granted almost all the claims of the men. The masons receive notably an increase of wages. Some 7,000 men, therefore, who had been out on strike for more than a week, have returned to work.

* * *

The Carron Co. have supplied 22 fire grates of special oriental design for the new palace of the Ameer of Afghanistan at Cabul. The grates are adapted for wood fuel.

* * *

The members of the Master Builders' Association at Bloemfontein refused to tender for the new Government offices unless they were supplied with bills of quantities, and were supported in this attitude by the associations in other parts of the country. The Orange River Colony Government has now conceded the request, and it is probable the undertaking will soon be commenced.

* * *

Professor Henry Adams, M.Inst.C.E., M.I.Mech.E., etc., delivers this evening, before the Association of Engineers-in-Charge, at St. Bride's Institute, his presidential address, the subject being "Standardisation."

* * *

The Sheffield Corporation's tunnel through the Bamford hills for bringing water from the Derwent Valley into the city has just been completed. It is 4 1-3 miles long, is the longest tunnel of its kind in the United Kingdom, and has taken over five years to construct. During the progress of the work the tunnel has been ventilated by electric fans, and all the material has been drawn out by electrically hauled trucks.

* * *

The Newbiggin Colliery Co., Ltd., Newbiggin-by-the-Sea, Northumberland, have recently placed an order for a complete plant for the erection of 602 miners' houses, with the (U.K.) Winget Concrete Machine Co., Ltd., Star Buildings, Northumberland Street, Newcastle-on-Tyne.

* * *

The paragraph on p. 274 of last week's issue relating to Messrs. Arthur L. Gibson's announcement of the completion of their new Radnor Works, Strawberry Vale, Twickenham, and that all future orders for Kinnear patent steel rolling shutters will be filled from that address, was in error in stating that correspondence should be sent to the firm's old address. Owing to the rapid development of business, the firm have found it necessary to remove their offices and warehouse to the works at Twickenham, as it became apparent that the concentration of all departments at one address would tend to the more efficient conduct of the business. All communications should therefore be addressed to Radnor Works, Strawberry Vale, Twickenham.

MESSINA: ONE OF THE FEW BRICK BUILDINGS ERECTED SINCE THE EARTHQUAKE.

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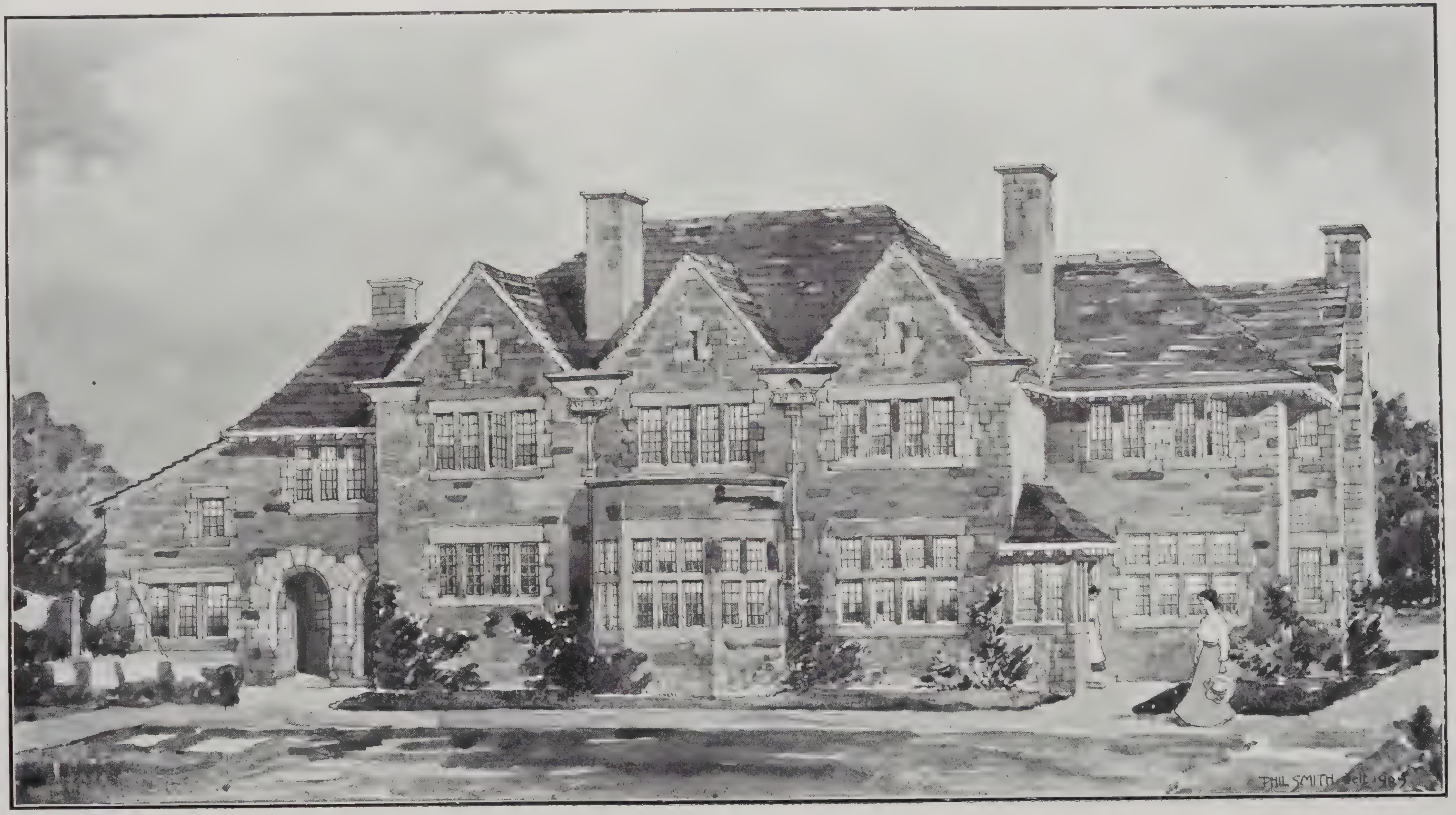
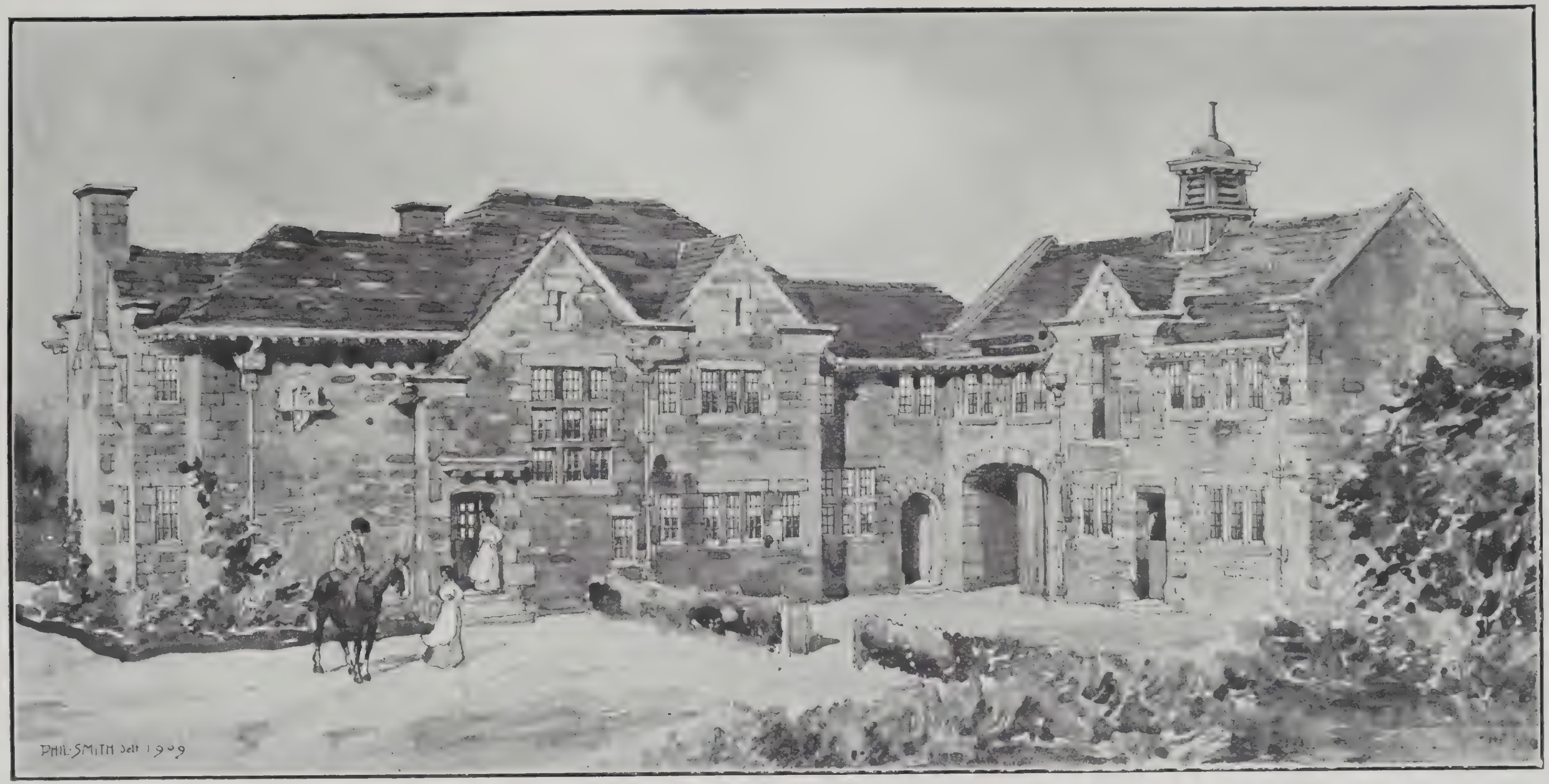


Garden Front.



Entrance Front.

PROPOSED HOUSE, HALIFAX. JOSEPH F. WALSH AND GRAHAM NICHOLAS, ARCHITECTS.

CONCRETE AND STEEL SECTION.

(MONTHLY.)

Cement Grout. Some interesting particulars have lately been given concerning the cement grout used extensively for injection into the masonry of the tunnels on the Metropolitan Railway in Paris. The Seine sand is rather coarse grained, and it was not found possible to make grout with it in the desired proportions of two parts of sand to one of cement, and use it with pumps or the Greathead injector. In fact, the proportions had to be reversed, two parts of cement being used to one of sand before it was possible to use it in this manner. Accordingly Mr. Buignet, one of the assistant engineers, carried out a series of experiments with various sands, finding the fine-grained Clamart sand (specific gravity about 1.14) the most satisfactory. Using this sand, it was possible to get any desired proportion, and a mixture of sifted sand and water could be injected. Experiments were made with a tube formed of planks filled with pebbles and coarse gravel. The Clamart sand grout penetrated and gave perfect cohesion for a distance of 23ft., while the Seine sand grout only penetrated to a depth of 2.3ft. from the opening. In the mixing 132 gallons of water were used per metric ton of the mixtures.

External and Internal Pressure. In the standard notation of the Concrete Institute we can use the following formula for the calculation of the resistance of a pipe to internal pressure. This formula applies to a strip of width b, and conforms generally to the methods adopted by the Joint Committee on Reinforced Concrete appointed by the Royal Institute of British Architects, the regulations of the German Government, and the by-laws of many cities in the United States.

$$A_T = \frac{p\ d\ b}{t}.$$

where A_T = area of steel in tension.
p = unit pressure on sides,
b = width of strip considered,
d = internal diameter,
t = safe unit stress in steel.

If the construction carries water—
p = 0.215 H, where H = head of water in feet.

The area A_T obtained from the formula is distributed in the form of hoops or spirals.

The thickness of the shell is determined by practical considerations; for pipes up to 9ins. diameter it is usually 1½in. to 2ins., and up to 3ins. beyond that diameter. Very often the thickness of large sewers is 6ins. and more, while reservoirs and Silo bins usually taper from 4ins. at the top increasing by 1in. for every 10ft. of depth.

To determine the area of longitudinal bars the portion of the shell between hoopings should be considered as a beam fixed at the ends, the bending moment it has to resist being $M = \frac{1}{12}$ w l., the concrete over the hoopings being in compression at the exterior of the shell and in tension in the interior, whereas the opposite takes place at the centre of the span between hoopings. The latter should be embedded at the centre as shown in Figures 1 and 2. As the shell is curved, 4ins. or 6ins. is a better unit to adopt for the width of the strip, as 12ins. is, as a rule, too great for close calculation.

If A_L = area of longtitudinal reinforcements,

$$r_1 = \frac{A_L}{b\ d_s\ (1-x)} \text{ and } r_2 = \frac{A_L}{b\ x\ d_s},$$

where r_1 and r_2 are the ratios of reinforcement related to the effective thickness of the inside and outside respectively, i.e.—inside and outside longitudinals.

$$\text{Therefore } r_1\ b\ h\ (1-x) = r_2\ b\ x\ h$$
$$\text{or } r_1\ (1-x) = r_2\ x.$$

h is already determined by the thickness having been settled by practical considerations, and $\frac{B}{b}$ is also known, so that from an inspection of $\frac{B}{b}$ diagrams for slabs and rectangular beams, we are able to obtain by trial and error values for r_1, and r_2 to satisfy the above equation and so determine the area of reinforcement for inside or outside, the greater value thus found being adopted.

It is necessary when pipes are moulded singly and are subject to handling, to increase the size of the bars as determined by the forgoing calculations.

When required to resist external pressure the pipe with its reinforcements is treated as a column under compression by the usual method, obtaining W by the formula W = ½ pd., where p = the unit pressure on sides and d = the external diameter. Treating the problem as for columns we have:—

$$c\ [A + (m-1)\ A_c] = \tfrac{1}{2}\ pd.$$

Where C = compressive stress intensity, m = modular ratio of the elastic moduli of steel concrete, A = area of section and Ac is the area of steel.

In this case, however, $r = \frac{A_c}{l\ h}$ or $A_c = r\ l\ d_s$

where A_c is the sectional area of hooping in a length l of the pipe and d_s the thickness of the shell.

A = l d_s, m = 15 and c = 500 therefore we obtain—500 l ds (1 + 14 r) = p.d.

in which only d_s and r are unknown. If either of these is assumed we can obtain the other.

Electrolysis in Reinforced Concrete. With the ever-increasing electrification of tramways and railways, and the tendency to place more and more electric cables of all sorts beneath ground, the phenomena of electrolysis demand the closest attention, not only from engineers, but from builders. For it may affect the sanitary work, the water, drainage, and gas pipes of cast-iron and lead, and so give rise to troubles inside or in the immediate vicinity of foundations. But what concerns us most is its influence on the steadily advancing practice of reinforced concrete construction. Anything likely to militate against this progress deserves earnest study, with a view to devising means of protection. Hitherto observations have been mainly directed to the action of electrolysis on the metal skeleton, and it has been freely argued that if the covering of concrete is good and sufficiently thick, the reinforcement is adequately protected against the attack of possible stray currents from adjacent earthings of rails or out-of-order cables. Recent experiments, however, rudely disturb this comforting view. True enough, good work—that is, well mixed concrete, used with sufficient lavishness and thoroughly tamped, offers a greater resistance to currents of feeble amperage, but after all it merely seems a question of time. Mr. A. S. Langsdorf was recently telling the Engineers' Club of St. Louis about his own and other people's experiments in this matter. Mr. A. A. Knudson embedded two-inch iron pipes for a depth of eight inches in concrete cylinders, formed of a mixture of equal parts Portland cement and sand, closing the bottom of the pipe with a water-tight plug. The protective coat of concrete was about four inches. These cylinders, also duly seasoned, were placed in tanks of pure water, the open ends not been submerged. Then one of the cylinders was subjected to the influence of a constant current of one-tenth ampere from a storage battery kept going continuously for thirty days, the current entering through the pipe and leaving through the concrete. The other cylinder was left undisturbed in its bath. Other experiments were tried with sea-water baths. In all cases it was found that where no electrolytic action took place the concrete protected the pipe, which remained quite bright. But wherever electricity was at work the pipes were attacked. Not only so, however, but it was found that the concrete itself had undergone deterioration. The cylinders were badly cracked, and the cracks lined with rust. Still more ominous, the concrete had become crumbly, disintegrating easily. The cracks were chiefly radial, and it may be, as Mr. Lansdorf suggests, that they were caused by the rust, which, having a less density and greater volume than the concrete or iron, and being loose, gave rise to a movement of expansion, and consequent fracture. This, however, does not account for the softening of the whole mass. In Mr. Lansdorf's own experiments he used twelve specimens, consisting of 1½in. iron pipe, embedded for 9⅜ins. in a 1:3:5 concrete (good cement, fine sand, and crushed limestone), made rather wet and soundly tamped. The protecting coat had a uniform thickness of 2ins. These cylinders were allowed to mature for fifty days, and were then placed in wooden blocks in six-gallon earthenware jars, filled with pure water, 1in. of the cylinders appearing above the water. Eleven of these cylinders were connected in series, and a current of 0.05 ampere passed through them without interruption for seventy days. Each week one cylinder was removed and broken open, and the pipes cleaned and reweighed. It was found that in all cases there was considerable loss, except in the cylinder not subjected to electrical influence. In a second series of experiments, again twelve cylinders were used, but the duration was reduced to 33 days, and the amperage increased to 0.2. Here corrosion was more rapid. Radial cracking was present in all cases, and so, too, was the general softening of the concrete, though in a less marked degree than in Mr. Kundson's experiments. It would appear, therefore, that the electrolytic action affects the concrete itself directly, and usually indirectly, owing to the corrosion of the metal skeleton. But the quality of the concrete evidently has an influence, and it seems quite possible that the admixture of waterproofing material to the concrete for foundations would provide the additional protection required. Or, again, possibly an outside rendering with a hard cement, drying with a glazed surface, as with Parian cement, would give us what we want. At all events, experimentation along these lines should be persevered in.

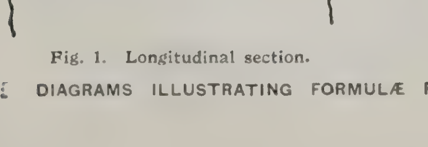


Fig. 1. Longitudinal section.

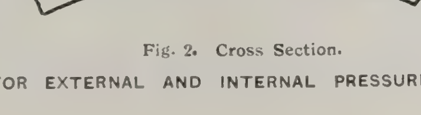


Fig. 2. Cross Section.

DIAGRAMS ILLUSTRATING FORMULÆ FOR EXTERNAL AND INTERNAL PRESSURE.

REINFORCED CONCRETE PILES.

(Concluded from page 211, No. 762.)

Figs. 1, 2, and 3, shows examples of Considère piling. These views relate to a reinforced concrete jetty head, in 45ft. of water, at Thames Haven, for the London and Thames Haven Oil Wharves, Ltd. The jetty head is 136ft. long by 32ft. wide, and stands 50ft. from deck to river bed. Fig. 1 shows a group of piles reinforced with the spiralled hooping rods on the Considère system, which were driven in place without any helmet or dolly. These piles formed the basis of main piers or columns which were made by casting concrete in the cylinders dropped over them around the piles, and the other reinforcing rods shown in the view. The final completed structures with the sheeting removed is shown in Fig. 2, and Fig. 3 is another view of the structure. These views show the adaptability of reinforced concrete piles to difficult circumstances, and the manner in which they can be united and strengthened. An interesting fact to record in this connection is that the original structure, which this work replaced, was carried away by the collision of a steamer.

Figs. 4 and 5 show some reinforced concrete piles, used in the United States, of a very simple form, which were put in place by simply churning them down into position by means of a water jet of the form shown in Fig. 6, which directed a stream of water at the foot of the pile. This method seemed to be sufficiently satisfactory, and the piles were put in place, whereas by the method of driving the gravel could hardly be penetrated, it taking about four days to drive one pile in the ordinary manner.

Another interesting application of reinforced concrete is in the protection of existing timber piling, and also for the armouring of timber piles newly driven. Where timber piles have been driven in water infested by the teredo, even when protected by creosote or similar means, they rapidly decay. The means of protection that have been devised consist of cylinders of concrete dropped round these timber piles. One of the most practical forms is "The Ideal," devised by Cooper Poole, engineer of Southampton, in the way illustrated in Figs. 7 and 8. The system is worked by the Cubitt Concrete Construction Company, and will be seen to consist of square slabs with projections, which dovetail one into the other, and are keyed together by means of steel rods dropped through holes in these inter-locking projections. Where the timber piles have been eaten away they are filled up with concrete poured inside these casings of slabs.

Fig. 9 shows another kind of pile, in which complete cylinders in the nature of pipes are dropped over the timber piles. Another form has half-cylinders clamped together. Fig. 10 shows how some timber piles have been protected by concrete, this design being for the pier construction adopted by the City Harbour Commission of San Francisco, California. The piles were driven in clusters of three and sawn off twelve, sixteen, and eighteen feet below the water level. After the piles were driven, wooden stave cylinders of 3in. planks were placed over these and driven 10ft. or 12ft. into the mud. These cylinders were then sealed at the bottom and pumped out, after which a cylinder of 16 gauge expanded metal 6ins. less in diameter was set inside, and the remaining space filled with concrete. The wooden stave sheeting would, of course, be destroyed by the teredo, but the concrete armoured piles render the main structure permanent.

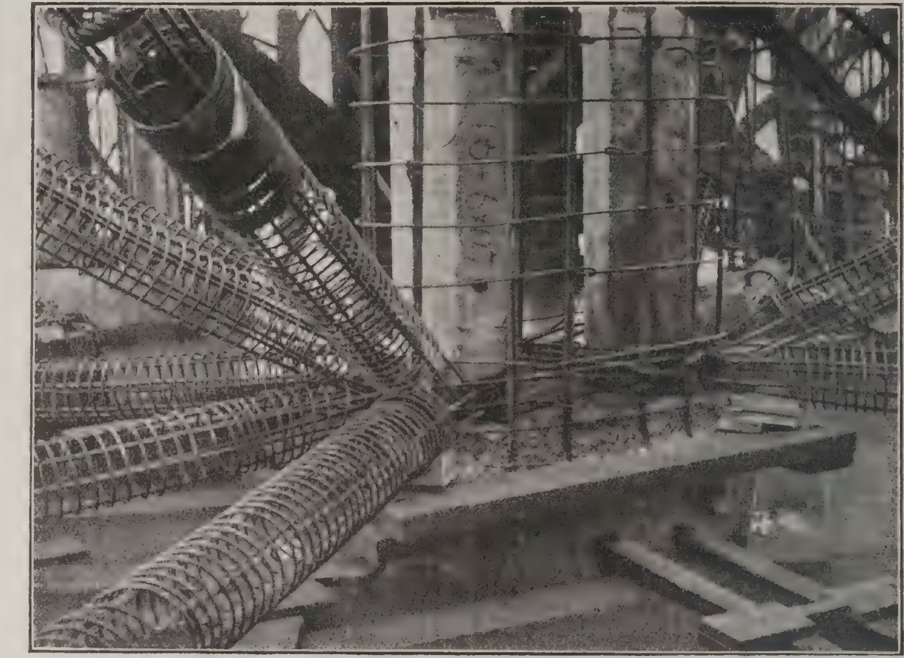


FIG. 2.—REINFORCEMENT FOR CONSIDÈRE PILES AT JETTY HEAD, THAMES HAVEN.

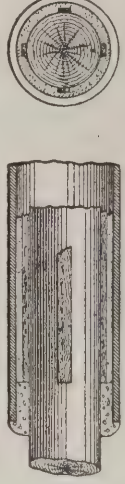


FIG. 9.—REINFORCED CONCRETE ARMOURING FOR TIMBER PILES, COCKLE CREEK BRIDGE, NEW SOUTH WALES.

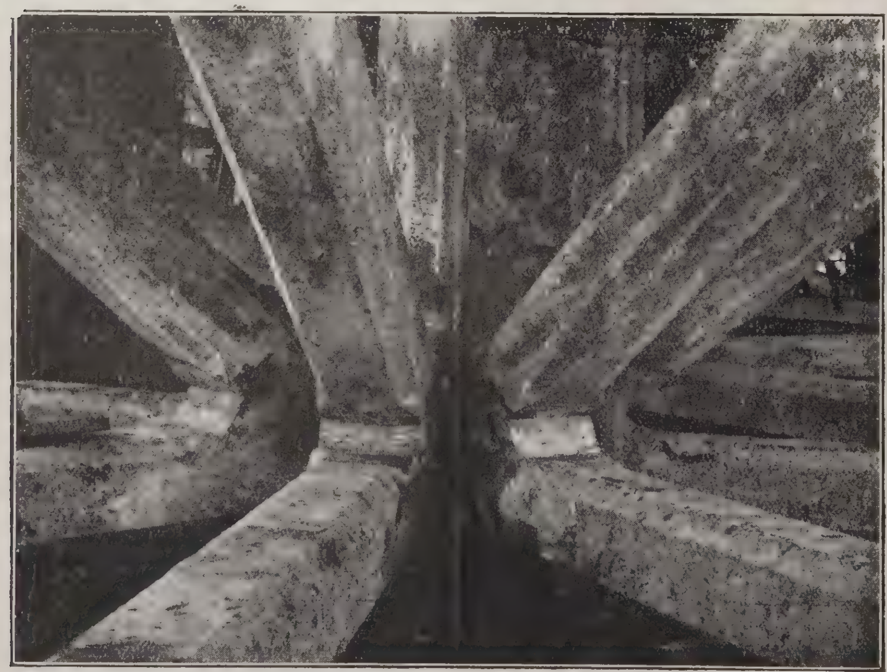


FIG. 1.—REINFORCED CONCRETE PILING, CONSIDÈRE SYSTEM, JETTY HEAD, THAMES HAVEN.

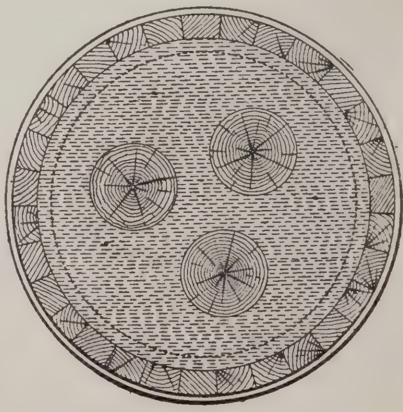


FIG 10.—REINFORCED CONCRETE ARMOURING FOR TIMBER PILES, WHARF CONSTRUCTION, SAN FRANCISCO.

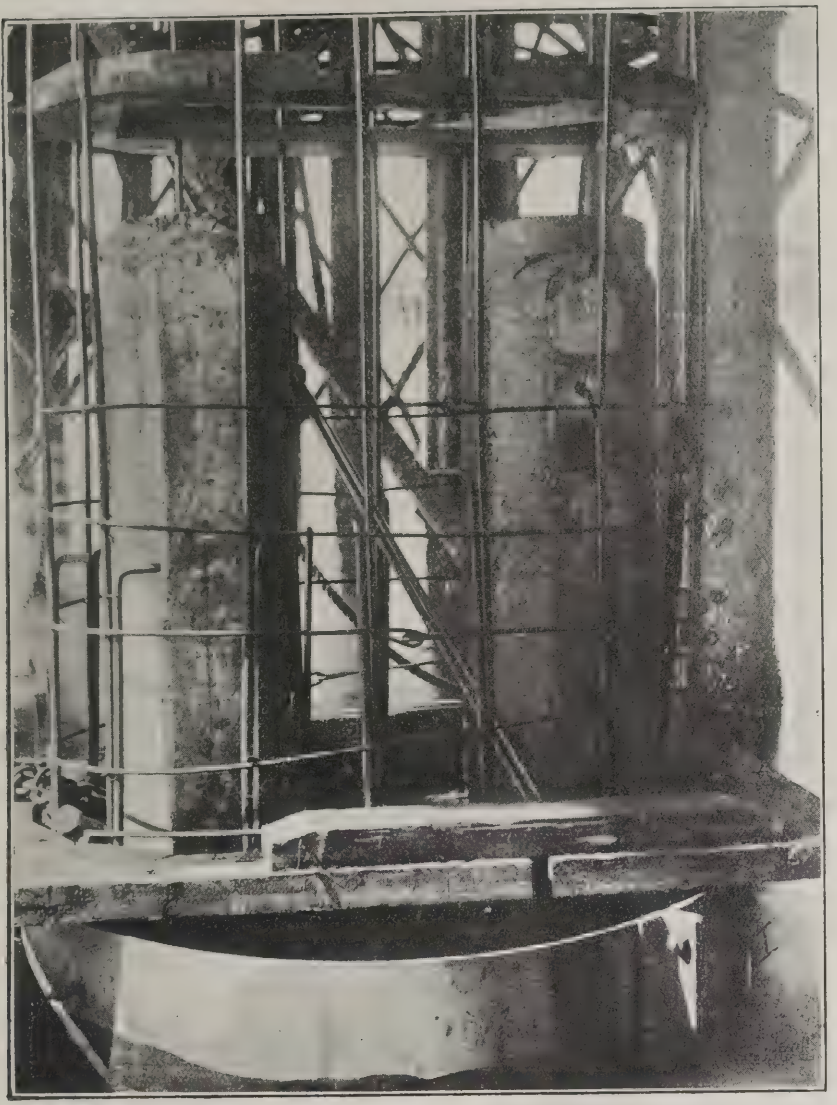


FIG. 3.—REINFORCED CONCRETE PILING, CONSIDERE SYSTEM AT JETTY HEAD, THAMES HAVEN.

A CONCRETE INDUSTRIAL VILLAGE.

The industrial village of Mineville, on the eastern slope of the Adirondack mountains has come into existence in proximity to the extensive iron ore mines and separating plant of Witherbee, Sherman and Co., in whose employment almost all the inhabitants are engaged. The settlement formerly consisted almost entirely of wooden buildings, as the company owns thousands of acres of timber land near the mines, and lumber was until recently the cheapest of materials. About six years ago Mr. S. Norton, the general manager for the firm, began experimenting with concrete blocks as a substitute for lumber, and so successful were the original experiments that now nearly all the important buildings on the company's property are built of concrete, and about fifty workmen's houses have been built of the same material, while more are in process of construction. Mr. Norton was formerly connected with a cement manufacturing company, and had learned the great advantages of good concrete construction. His faith in the material has been amply justified by the results at Mineville.

One of the factors that led to this extensive use of concrete was the possession by the company of a very superior aggregate in the shape of the "tailings" or residue left

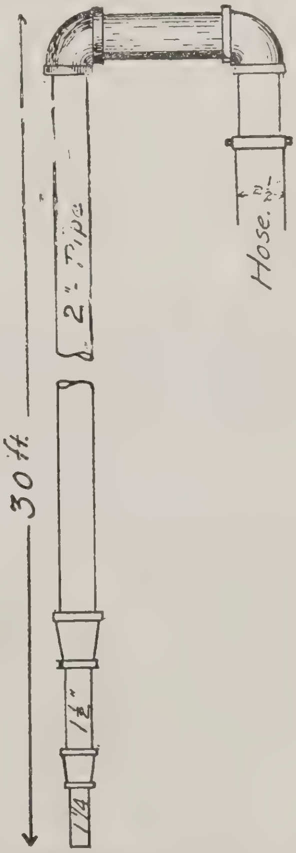


FIG. 6.—ARRANGEMENT OF WATER JET FOR DRIVING PILES.

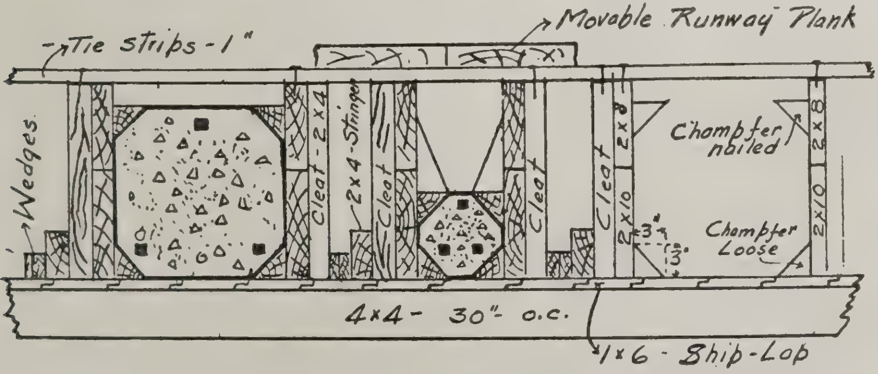


FIG. 4.—REINFORCED CONCRETE PILES DRIVEN BY WATER JET.

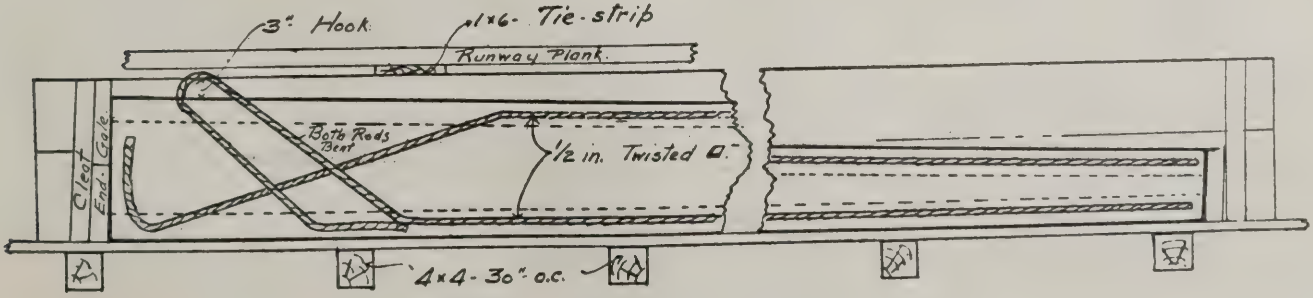


FIG. 5. REINFORCED CONCRETE PILES, DRIVEN BY WATER JET.

after the separation of the ore. An immense heap of these tailings gives a seemingly inexhaustible supply of aggregate, and tests have proved that cement mixed with the run of tailings in the proportion of 1 to 5 produces a very superior concrete block without the addition of sand or gravel. G. B. Dixon, chief chemist of the Glens Falls Portland Cement Co., tested briquettes made of one part "Iron Clad" Portland cement and three parts ore tailings, and found that after 7 days they stood a tensile strain of 341lbs. to the square inch, and after 28 days they withstood 450lbs. to the inch. Briquettes made one part cement and three parts sand showed only about half the above strength. Tests have also been made, using a mixture of 1 of cement, 4.4 tailings and 9.42 broken stone, or 13.82 parts stone and tailings to 1 of cement. With this mixture the following crushing strength per square inch was developed: 30 days 1,010lb., 60 days 1,273lb., 90 days 1,428lb., 120 days 1,378lb., 150 days 1,653lb., 180 days 1,686lb.

The company will build no more permanent structures of wood, and as the existing wooden buildings are replaced from time to time with concrete, Mineville will present the spectacle of a village built entirely of concrete in the midst of thousands of acres of timber land.

The company operates its own plant for manufacturing concrete blocks and cement bricks. Blocks are made from the run of tailings, one part cement to 5 of tailings. Bricks are made 1 to 3, the tailings being screened. Blocks are cured one week before using, being stacked under a shed and moistened by a rotary spray. The capacity of the plant is 300 blocks 8in. × 8in. × 20in. per day with five men.

The first cost of the concrete block workmen's houses built by the company is about the same as with lumber, but with the decreased cost of maintenance they are far cheaper in the end. All block walls are firred with an inch strip of wood lath, and no trouble is experienced from moisture. The houses are warm and comfortable during the severe Adirondack winters, some of the smaller ones being heated only by the family cook-stove. The houses are built to rent on the basis of $1.00 per room per month.

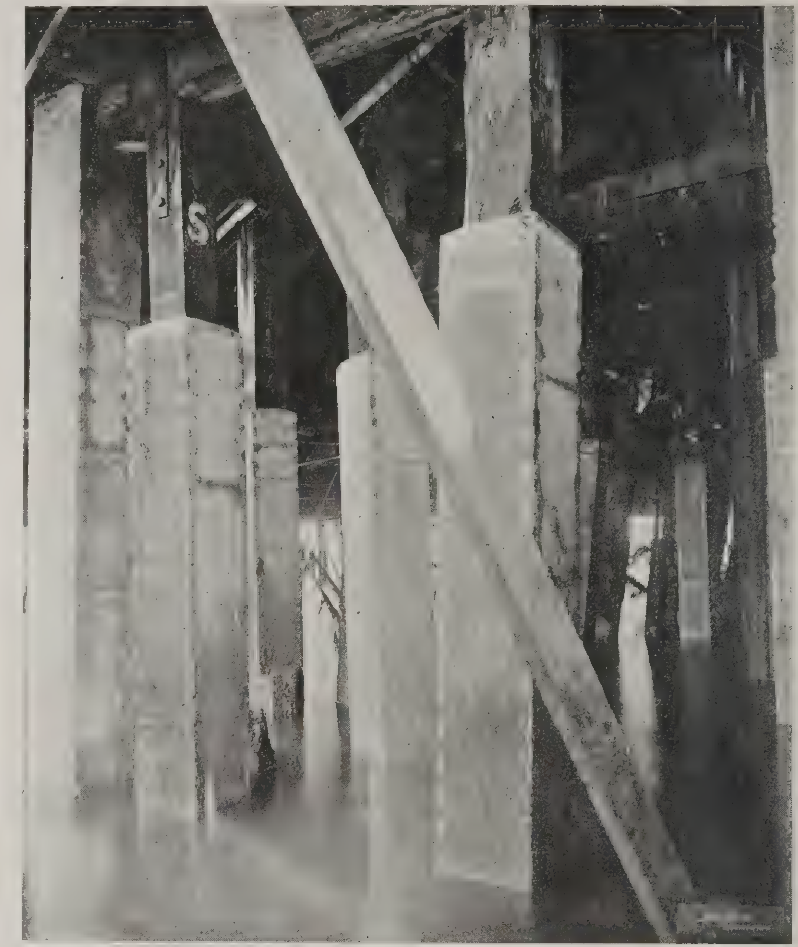


FIG. 8. VIEW OF THE PILES FOR THE ROYAL PIER, SOUTHAMPTON, PROTECTED WITH THE IDEAL SLABS.

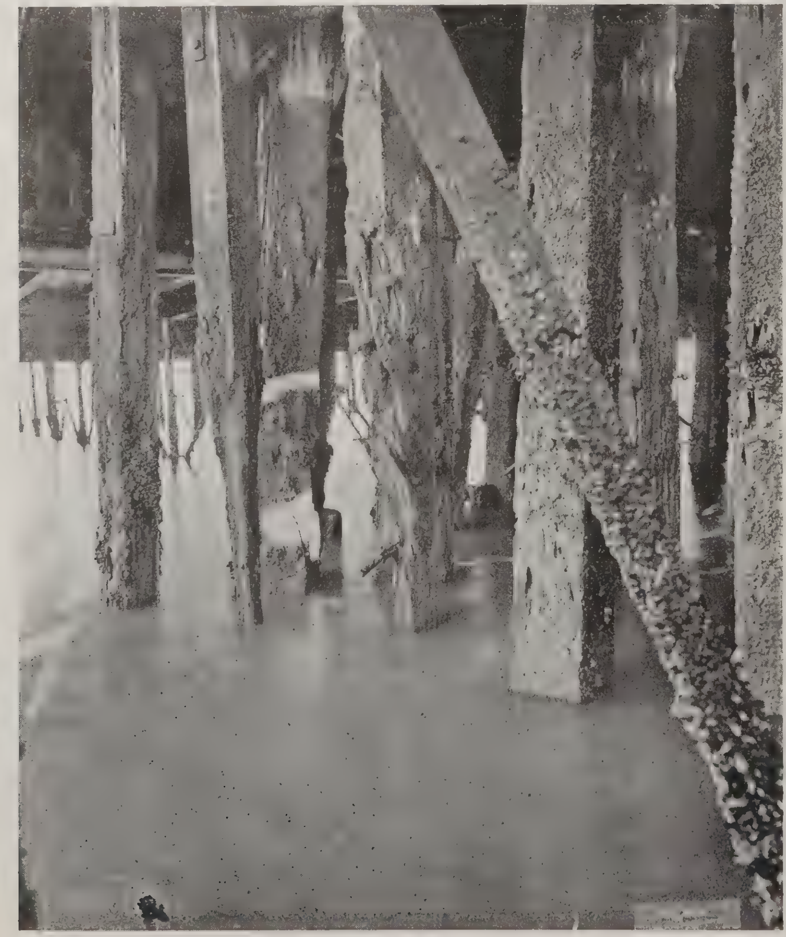


FIG. 7. VIEW OF TIMBER PILES, ROYAL PIER, SOUTHAMPTON, BEFORE BEING REPAIRED.

Around the office building at Mineville the company has built a driveway 600ft. long, 14ft. wide, and 5in. deep, using a mixture of 12½ parts ore tailings to 1 of cement on the average.

ADHESION OF STEEL TO CONCRETE.

Some important tests to determine the adhesion of steel to concrete have been recently carried out at the Vienna Museum of Technology, and the results have now been made public. The tests were made with 8-in. cubes of concrete, in which were embedded round steel rods, about ¾in. in diameter, passing through the centre of each block in the direction in which the materials were stamped in the mould. The concrete was mixed with four different proportions of cement to aggregates, and the rods were drawn six weeks after the blocks were made. The mean adhesive strength in lbs. per sq. inch in the four mixtures was found to be as follows:—(a) 447.9, (b) 600.2, (c) 645.7, and (d) 655.7. The cubes were not injured in any way by the withdrawal of the rods, and no cement remained attached to the rods. The tests showed that a fat concrete did not greatly increase the adhesive strength, as by trebling the amount of cement the increased adhesive strength was under 50 per cent. Similar cubes tested for crushing strength seven months after moulding showed results in lbs. per sq. inch as follows:—(a) 1,052, (b) 1,450, (c) 1,834, (d) 2,176. The (a) mixture was 1 to 12, (b) 1 to 8, (c) 1 to 6, and (d) 1 to 4 in each case.

THEORETICAL AND EXPERIMENTAL RESEARCHES.

(The figures in this article are Italian Weights and measurements. An Italian ton equals 2237·7lbs. English.)

Tests of the Effects of the Shear Stress in Beams of Re-inforced Concrete.

Professor E. Morsch, of the Zurich Polytechnic, has made some very interesting tests on reinforced concrete beams constructed according to designs which he furnished the firm of Messrs. Wyass and Freytag of Neustad; the object of these tests was to establish the truth of the so-called German method of calculation for the shear resistance and for the adhesion between iron and concrete.

The result of these tests was made known at a conference held by Professor Morsch at the Society of Engineers and Architects in Zurich, and we give a summary of these interesting experiments, together with the tabular statement of the results that were recorded.

According to Professor Morsch, the trial beams were to be constructed in such a manner as to immediately exhibit the effect of bending strain. This was obtained by using rather short beams. In order to obtain a convenient system of loading, and at the same time to prevent the development of secondary torsional strains, every piece which was to be tested was constructed as a pair of beams placed side by side united by a large horiontal top flange or table placed across them. The composition of the concrete was the normal one of 1 to 4½—aged at time of testing about three months. The section of steel in the middle was the same in all the beams; the sides were painted in white so as to show up the smallest cracks.

The tests with the 12 beams were divided into 3 groups according to the load; six beams had evenly distributed loads, three had two loads concentrated at third-points of the length and three had the load concentrated in the middle. (Tables 1 to 12.)

The "German method" of calculation supposes that the steel reinforcement of the extended part resists the internal horizontal tensile force without any strain of the concrete. However, as long as the steel adheres to the concrete the difference between the strains must be transmitted by the concrete of the main body to the compressed part. According to this hypothesis, there are constant horizontal and vertical shear strains in the whole height of the beams even to the neutral axis, and these strains produce principal tensile stresses τ_0 of equal intensity and at an angle of 45 degrees. As the resistance of the concrete to tension is less than that to compression and shear, it follows that a body pulled in such a way must crack in a direction normal to the principal stresses. Tests made on cylindrical bodies strained by torsion confirm this deduction, inasmuch as the rupture always follows a diagonal helicoidal surface of 45 degrees. From this it is to be gathered that the steel reinforcements should be placed at a corresponding angle of 45 degrees to these strains. The tests have shown that this method of placing the steel is the safest.

The dimensions of the beams which were tested and their reinforcements and the essential results are summarised in the following table. The cracks which lead to rupture are shown in heavy black lines in the illustrations; cracks occurring during the loading are marked, as also superficial cracks. In the table the tension at failure is recorded in black type.

Beam.	First Tensile Crack.		Commencement of the Diagonal Cracks which lead to Rupture.					Period of Rupture. (The bolder Figures indicate point of Rupture.)				
N,	Load.	σf	Load.	σf	τ_1	τ_0 At the Supports	τ_0 At the end of top the Cracks.	Load.	σc	σf	τ_1	τ_0
	Tons.	kg./cm.^{2}	Tons.	kg./cm.^{2}	kg./cm.^{2}	kg./cm.^{2}	kg./cm.^{2}	Tons.	kg./cm^2	kg./cm^2	kg./cm^2	kg. cm^2
I	7.0	668	15	1260	8.65	10.5	7.4	25·7	38·0	2060	13·9	16·9
II	13.7	1200	30	2410	16.5	10 0	7.0	40·0	58·0	3150	21.2	12·9
III	5.8	710	13	1370	7.25	9.3	6.0	19·5	28·0	1960	10·3	13·2
IV	9.0	810	33	2570	53.5	21.7		42·0	62·0	3260	67·0	27·0
V	7.0	702	14	1260	14.4	10.3	7.6	31·0	48·3	2600	29·4	21·0
VI	6.0	590	19		32.5	13.1		37·8	56·0	2950	60·8	24·5
VII	7.5	862						34·0	65·0	3420	63·0	22·4
VIII	5.1	648	9.8	1115	10·7	10.7	9.7	23·4	47·6	2450	22·8	22·8
IX	5.9	735	14.5	1580	15.0	19.9	9.0	25·6	52·2	2690	24·8	17·7
X	7.5	1240						27·0	(77·5)	4050 3880	50·7	18·1
XI	6.0	1045						26·0	(83·0)	4000 3800	25·1	17·9
XII	5.5	940						26·0	(74·6)	3900 3740	49·0	17·5

1st Group. Evenly Distributed Loading.

The Beams I., II. and III. are reinforced with straight bars; one half has a row of stirrups, but there are none in the other half. The Beam II. differs from I. by the vertical rib being double the size. Beam IV. differs from Beam I. by the fact that instead of round bars there are mechanical bond bars which are greatly used in America and which many engineers in Italy have recommended. In the bars used in this case, the section of the bar, at the flattened portion, amount to 2.04 cm^2, while the round part had a section of 2.54 cm^2.

In Beams IV., V. and VI., the reinforcing bars were bent up and especially in Beams IV. and VI., near the two ends at an angle of 45 degrees, and in Beam V. at a lesser angle like what is usually done to the steel reinforcement in ordinary reinforced beams. By σf =1,000 an actual load of 11.5 tons is obtained, calculated according to "the German method" in all the beams, with the exception of III. In all the beams, except II., large cracks were found in the middle before the whole of this load was applied. The cracks which were short and small at first, got larger with the increase of the load.

Beam I. Besides the small cracks a diagonal crack, commencing above and extending by degrees to the bent end in the part of the reinforcement not provided with stirrups, became visible when the load was 15 tons. By increasing the load, the crack became horizontal extending over the bar towards the support; at the same time the iron bars bent downwards very much. At 25.7 tons the adhesion between the steel and concrete was completely destroyed at the support, so that the resistance of the steel was not transmitted to the concrete which the bend at the end of the rod is designed to afford. At this point the cracks got larger, the bend at the end curved upwards breaking up the concrete and causing immediate rupture.

Beam II. In this larger beam, the first cracks became visible much sooner than in No. I. At a load of 30 tons, two diagonal cracks were noticed, the left one extending upwards towards the right hand along the top flange, while the other extended downwards towards the left along the bar up to the load of 40 tons. At this load, rupture resulted from the general increase in the size of the cracks and the adhesion of the steel to the concrete having been overcome at the support. These two tests contradict the hypothesis that the diagonal cracks are observed as soon as the resistance of the adhesion between the steel and the concrete is overcome. At the beginning of the cracking, the adhesion required between the steel and concrete was double in the second beam to what it was in the first; instead the values τ_0 7.4 kg/cm2 are corresponding, and hence the shear stress should be taken as the cause of the cracks. The fact that the steel becomes disconnected from the concrete is not the cause but rather the consequence of the diagonal cracks. There are no more oblique tensile forces throughout the cracks and the superficial forces which are at first horizontal become diagonal converging to preserve equilibrium towards a point of the transverse force.

Besides the horizontal forces, there are other vertical components of the stresses above and below the supports. The part of the beam on the left pushes the compressed area of the right portion of the beam upwards and the part of the beam on the right pushes the area of the left part downwards. In the immediate vicinity of the cracks there is, however, a tendency in the right portion to pull away the compressed flange, and in the left part the tendency instead is to pull away the steel of the lower part from the ribs. Thus the horizontal lengthening of the diagonal cracks is observed in the upper part towards the right, and in the lower part towards the left. The greater amount of fracture obtained in No. II. compared with Beam I. is explained by the fact that the crook at the end is secured in a better manner in the wider ribs.

The rupture being always noticed on the portion without stirrups, it follows that these act favourably on the resistance of the system. Above all, these stirrups resist the tensile forces by easing the oblique tension so as to delay the appearance of the diagonal cracks; besides they oppose the separation between the compressed flange and the ribs.

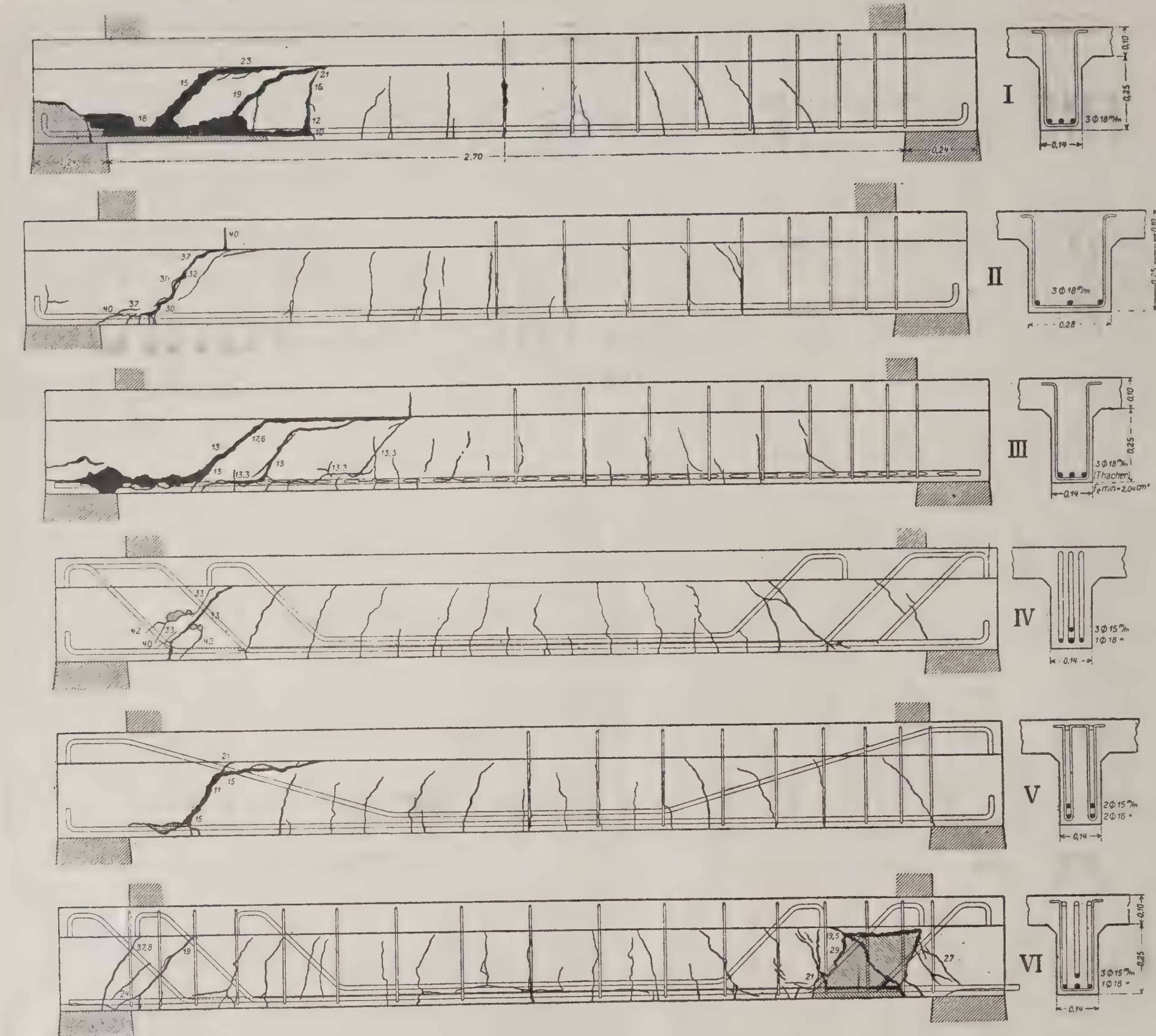
The same effect as is shown by the last test could, however, be gained by bending up the bars forming the principal reinforcement; in this case only an entirely secondary part of the stirrups remains, which is not worth troubling about in calculating the resistance. Such stirrups must always, however, be taken into account in calculating the effective strains in respect to their resisting the tensile forces due to certain secondary external actions; the hypothesis that the stirrups resist the shear forces is inadmissible.

The fact that the diagonal cracks are produced at a certain distance from the support is explained by the second fact that vertical stresses are produced over the supports by compression between the fibres of the beams, which act in easing the principal tensile strains; besides it must be noted that in the vicinity of the supports cracks due to the forces of traction are not formed in the concrete. The consequence of this is that the calculated value of τ_0 is really obtained only in the neutral axis; this is less towards the bottom, and hence the lower parts of the section ease the upper parts.

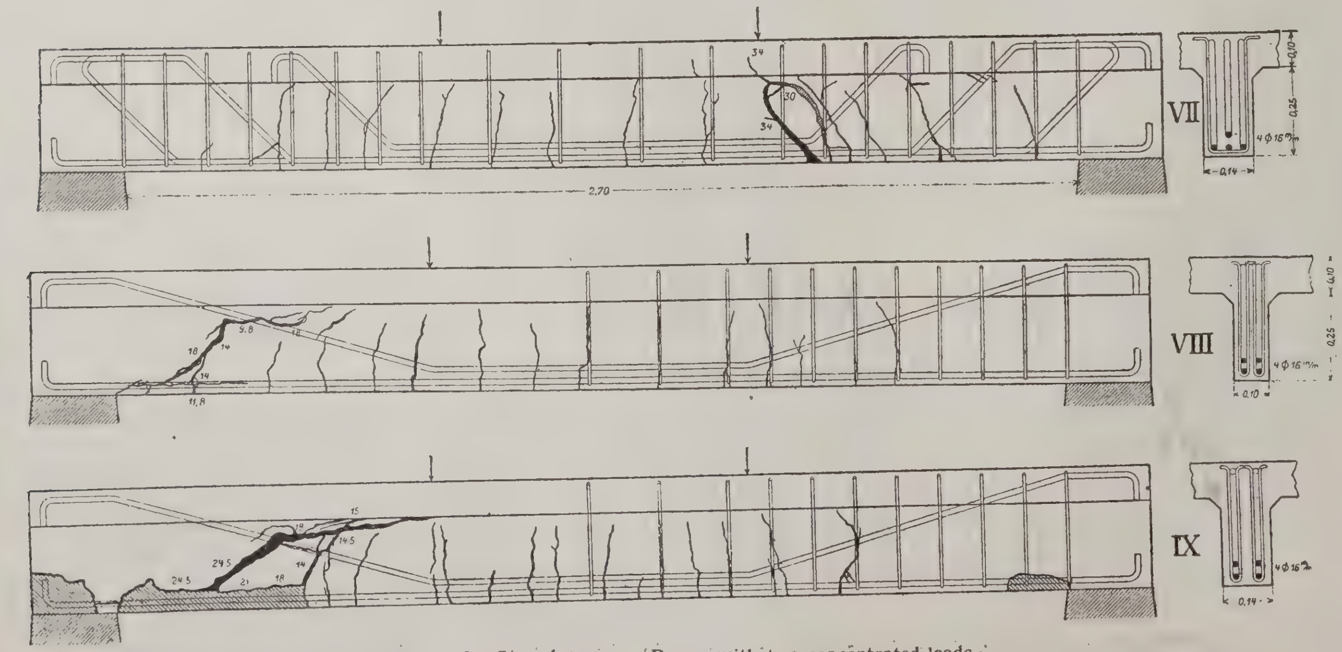
(To be concluded.)

SMOKE AND REINFORCED CONCRETE.

Considerably more than a year ago, the Austrian Government entrusted Professor J. Klaudy, of Vienna, with the task of determining whether smoke penetrated reinforced concrete structures, and if so, with what result. The inquiry was induced owing to the increased presence of corroding coal smoke in the atmosphere, which is found to be attacking both iron and stone. Professor Klaudy made an exhaustive study of all available buildings, some of which are over twenty years old. He found that smoke does not permeate well-made cement concrete, but that in almost all instances it does manage to make its way into concrete masses by any of the tiniest fissues. A smooth outer coating of fine cement, therefore, seems necessary as a protection. But the matter is not of great importance, for so far as Professor Klaudy's investigations went, it was evident that smoke does not have a destructive effect on either iron or steel, if the reinforcement is properly imbedded in well-made concrete.



Figs. 1 to 6.—First Group. Beams with uniformly distributed loads.



Figs. 7 to 9.—Second group. Beams with two concentrated loads.

THEORETICAL AND EXPERIMENTAL RESEARCHES IN REINFORCED CONCRETE BEAMS. *(See previous page.)*

Views and Reviews.

"Portland Cement."*

We are glad to welcome the second edition of this valuable book, written by Mr. A. C. Davis, F.C.S., who, by-the-way, is Managing Director of the Saxon Portland Cement Company, Ltd, of Cambridge, and some associated undertakings. This fact is worth mentioning because it emphasises the fact that Mr. Davis writes with the fullest qualifications as to practical experience as well as theoretical knowledge of the subject; he writes as a manufacturer as well as a critic, and this book is stamped by professional knowledge not only of the scientific aspect, but also of the commercial aspect of the subject. The book is a most valuable treatise, and all those interested in the subject should undoubtedly possess a copy. The mere enumeration of its contents shows how thoroughly the subject is treated. After an introduction and the definition and description of the invention of Portland Cement, Mr. Davis goes on to write of raw materials, their grinding and mixing, and their estimation and analysis, followed by a chapter on the burning or calcining of the raw materials, then the grinding of the clinker, followed by the chemical testing, sampling, and commercial testing; then he adds information with regard to the fineness and sieving, specific gravity, setting, contraction and expansion, tensile compression and transverse tests, and concludes the volume with three appendices, one containing the British, American, German, and French Standard specifications of Portland cement, the second containing useful tables, metric equivalents, etc., and the third a list of the manufacturers in England and Wales, with their approximate weekly tonnage output in 1907. The last mentioned is perhaps one of the most valuable features of the work. Read in conjunction with a map included in the front of the work showing the location of cement factories in England, Wales and Scotland, it enables the buyer of cement to know where to go for his materials.

The importance of the cement industry is shown by statistics of production. It is estimated that the total quantity of cement produced by the world in each year is from thirteen to fourteen million tons; of this quantity 3½ million tons is produced in Germany, 2½ million tons in England, 600,000 tons in France, nearly 500,000 tons in Russia, 250,000 tons in Belgium, and a total of 400,000 to 500,000 tons in Switzerland, Austria, Sweden and Norway, Roumania, and Italy. The United States produces at least 5 million tons, and Canada 260,000 tons. These statistics, which Mr. Davis gives, are interesting, and show clearly how the United States stands foremost as a producer of Portland cement, while Germany is also a good deal ahead of England. America does not to any great extent compete with us for the export trade, but Germany does, and it is to be hoped that our manufacturers are holding their own; they should be able to do so from what we have seen of their capacity. The modern English manufacturer possesses a good plant as anywhere abroad, and knows as much of the best and cheapest methods of producing cement as anybody, while the natural resources of England for the production of cement are about as good as those of any other country.

In the foregoing statistics we do not know whether the quantity of natural Portland cement produced in Belgium is included, though we presume it is, in which case it is obvious that the great amount of agitation that has taken place in reference to the use of natural cement in this country in substitution for Portland cement has been rather overdone and somewhat magnified the importance of the subject. It is right that the consumer should be put on his guard, but one would think from the excitement that has been caused, there was a very large tonnage of cement exported from Belgium, whereas the total quantity produced seems hardly sufficient to cope with the internal trade alone, if Mr. Davis's figures are correct.

One great feature of Mr. Davis's book is that he does not deal solely with one process of manufacture, but with all. Mr. Davis has had experience as a manufacturer of cement by the wet and dry process, and he can therefore speak without really being biassed in any one direction. The fact that he has had this experience means that we must regard his critical remarks upon the various methods with great attention, and give them great weight. He is quite rightly entitled to have his preferences. A good cement can be manufactured by any of the processes, and doubtless the cost of production is dependent upon many factors, so that we cannot draw any hard and fast line as to which is the most economical method, that depending upon the locality and the nature and quality of raw material available and cost of working same.

The rotatory kiln has been introduced into this country chiefly because of its perfection and success in the United States. It is claimed by one school of manufacturers as the best, but from Mr. Davis's very clear summary of the various processes and means of manufacture it appears that the Schneider continuous kiln offers a means of manufacturing cement as uniform and reliable as that produced by the continuous rotatory kiln process, and in many cases seems to offer advantages on the score of cheapness of production, which may possibly account for the low prices at which cement can be obtained from manufacturers who have adopted this process of manufacture, though here again we ought not to come to any final conclusion, for the financial position of the manufacturers —their capital and plant, and the deposits for raw material available—so greatly affect the situation. The rotatory kiln, when properly worked, seems to produce a cement of remarkably fine quality; indeed, the very best cement that has been produced up to the present, and that gives the highest results, is obtained from the rotatory kilns. Yet it is claimed that with the Schneider process as good cement can be obtained with the fixed kiln. To the user, then, it is solely a question of price.

Mr. Davis describes in detail the process of manufacture by the rotatory kiln, and by the fixed kiln, and generally gives a short history of the stages through which the different methods and appliances of manufacture have passed since their inception. His description of the methods of testing Portland cement is very detailed and very well done. We regret that for so many years cement manufacturers and engineers should have placed so much importance upon tensile tests on cement. Really, it is very seldom that we ever require cement to develop tensile resistance; we use it almost exclusively to develop compressive strength, and cement manufacturers should have long ago improved their manufacture by the study of compression tests. We have heard many statements which we believe to be correct, that cement can be manufactured having a high tensile resistance, and yet giving very poor crushing strength. Such cement is very much inferior to other cements which, while they exhibit a very high crushing resistance, do not show up so well in the standard tests. If, however, cement has a high crushing resistance and just passes the other tests for soundness, in practice it will prove to be thoroughly satisfactory. We require cement to give us very great crushing strength; we do not want it to expand nor do we want it to contract to any considerable extent, and we want it to remain sound. That is the sum total of our practical requirements. Some cements badly manufactured show considerable expansion, and occasionally work that has stood well has suddenly began to disintegrate after about two or three years. The cement manufacturer of to-day is able generally to overcome such obstacles and to produce a very uniform and excellent product, but he does not always give sufficient attention to the development of high compressive strength. Mr. Davis, while he deals extensively with tensile testing machines, does not deal at all adequately with compression tests. It should be noted that the proper form for a test piece is not a cube, but a parallelopiped whose height is one-and-a-half times the length of the side. This allows the material to shear normally.

Reference is made to transverse tests, and the formula for the modulus of rupture usually included in text books is adopted. As a matter of fact, this formula is incorrect, as the results of tests show, and though transverse tests may be valuable taken in conjunction with others, for comparison one with another they are of very little value until we have determined the true relations of internal stresses in materials, and the relation of compressive, tensile and shear stresses of cement and concrete.

It is all very well to test cement in compression and tension, but the best and most reliable tests are those on sand and cement cubes and briquettes; in fact, we would discard the neat cement tests altogether except for soundness. Then, again, in determining the value of cement we believe that tests ought to be conducted on blocks of concrete made with various standard aggregate, and not merely with Leighton Buzzard sand.

We suggest to Mr. Davis that in future editions a valuable feature of the work would be a collection of memoranda regarding the practical uses of cement, as, for instance, tables showing the weight of cement per cube foot, having the different finenesses of grinding under the general conditions of manufacture to-day, and the best figure to adopt as regards commercial cement; the quantities of mortar in various proportions that different quantities of cement will make; these proportions being reckoned by weight and by measure, also practical memoranda regarding the quantities of concrete when rammed in place, which result from various proportions and quantities of aggregate, sand and cement, etc., etc. Such information would be extremely valuable to the practical user of cement, but unfortunately nearly all the text books do not provide sufficient information on the subject, and no reliable data are obtainable. However, Mr. Davis has given a large amount of his store of knowledge in this book, which is bulky. We only hope that, in future editions, he will help us with still more information. The book, notwithstanding its size, gives evidence of having been greatly abbreviated; and much more detail would be welcomed by the reader The book would serve as the basis for a monumental work.

Considering the manner in which Portland cement is increasing in importance in the building and engineering trades during the last decade, this book should find a wide circle of readers. Reinforced concrete is a new phase of the subject, and it is a method of construction which is increasing by leaps and bounds, so that more and more attention is being attracted to the subject of Portland cement; therefore, a book like this, written by an acknowledged expert and manufacturer, who understands the commercial necessitities of the practical side of the subject, is most valuable.

"Reinforced Concrete in Europe."

The author of this book, Mr. A. L. Colby, was sent to Europe in 1908 by several of the largest American steel manufacturers to investigate and report upon the applications of reinforced concrete in Europe. Reinforced concrete has made tremendous strides in the United States, and no doubt the subject has attracted the close interest of the steel manufacturers of that country, and we can well understand the importance they attach to a thorough investigation of the conditions appertaining to the applications of this new method of construction in its original home —Europe. The report that Mr. Colby submitted to these prominent American Institutes has now been printed in book form, and it forms a very valuable précis on the subject.

Mr. Colby's report is very fairly written, and it may be described as a triumph for

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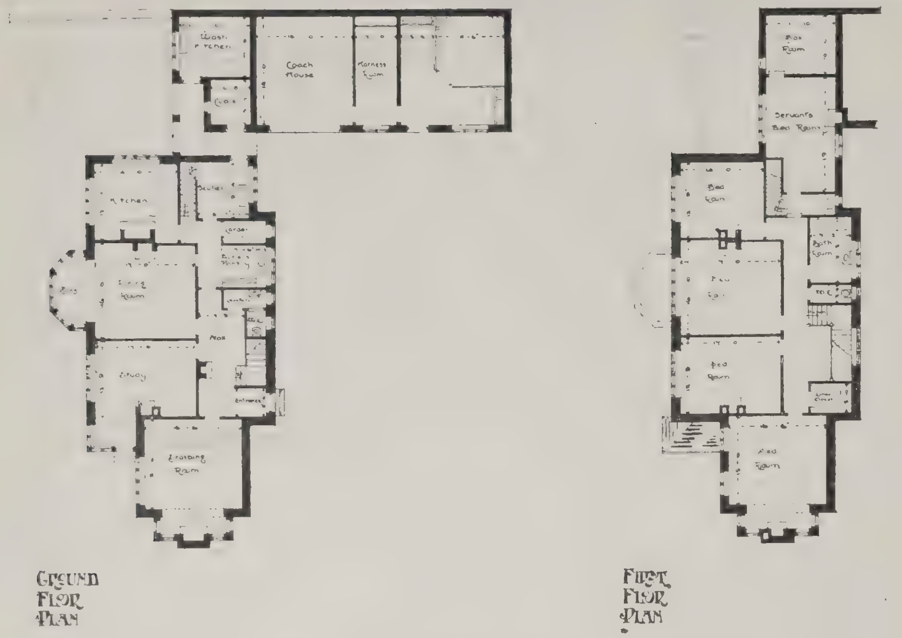
* "Portland Cement," by A. C. Davis, F.C.S., A.M.I.C.E., etc. Second edition, revised and enlarged. London, Woodford, Fawcett and Co., Southampton Street, Strand, W.C. 15s. net.



PROPOSED HOUSE, HALIFAX. JOSEPH F. WALSH AND GRAHAM NICHOLAS, ARCHITECTS.
(*See Centre Plate.*)

reinforced concrete because, when we heard of his quest we were inclined to think that, perhaps, the endeavour of the American steel firms was to work up a case against reinforced concrete. There have been many failures in the United States due to bad workmanship, but so have there also been failures in steel; the steel firms can no more point to reinforced concrete being more dangerous than steel-work than *vice versa*. Their position as advocates of steel construction versus reinforced concrete can be met with the reply that steelwork, *per se*, did not prevent the gigantic disaster to the Quebec Bridge, nor did it render the Blackwall Island Bridge secure as at first designed and constructed.

However, whatever may have been the intentions of those who sent Mr. Colby to Europe to investigate, he has dealt with the matter fairly, and he finds remarkable little evidence of failures in reinforced concrete construction, and his report practically advertises the efficiency of reinforced concrete and is a great point in its favour. He found that not only was reinforced concrete a thoroughly satisfactory form of building as regards endurance, but he found, too, that there was no doubt as to the economy of reinforced concrete construction, even over steelwork. He states that the saving was admitted on all hands to be phenomenal, and that as to actual percentage savings, statements varied from 10 to 30 per cent., and in one case 50 per cent. One instance was cited of a warehouse which had been entirely constructed in reinforced concrete at a cost of not more than that of the steel alone which would have been required if erected as a steel structure.

Among other points affecting its economy, other than the saving in first cost, Mr. Colby refers to the following:—

1. Superior fire-resisting qualities.
2. Greater rapidity of construction.
3. Increase of floor space.
4. Decrease in cost of maintenance.
5. Monolithic nature and freedom from shock and vibration.
6. Decreased rate of insurance.

The report abbreviates the opinions of authorities and official publication in respect to reinforced concrete that have appeared for many years past, and it forms a most valuable summary of all the regulations in various countries, reports of commissions, etc., such as that of the Committee of the Royal Institute of British Architects.

Mr. Colby says that though failures have occurred on the Continent, these have been due to the use of unsuitable materials and ignorant or dishonest workmanship, and are less frequent than in America for the reason he gives, that the Government rules and the City Building By-laws governing the principles of designs in the erection of buildings, bridges, etc., are rigidly enforced, and thus prevent the erection of reinforced concrete structures by incompetent and unscrupulous contractors, such as those whose work has caused the collapse of a number of buildings in the United States. He says that this is particularly true in Prussia, Austria-Hungary, and France, and in Great Britain, he says that failures are much less frequent than five or more years ago, because this form of construction is now mainly entrusted to reliable firms. Mr. Colby states that after investigating all the failures abroad of which he could find any record, he was led to the conclusion that (1) the number of failures abroad have been very few in comparison with the multitude and variety of structures erected since 1870; (2) that the failures almost invariably occur during construction; (3) that no accident or failure has been traced to any lack of durability or inherent weakness in reinforced concrete construction. On the contrary, it has been definitely proved that the strength of concrete increases with age up to three years at least; (4) defective designs have caused a number of failures abroad, the usual errors being insufficient provision against shearing and insufficient dimensions in the design. But he adds, ignorance of the theories and principles involved is not an argument against this latest form of construction; (5) the use of unsuitable materials has been the cause of some failures. Cement and the aggregates should, therefore, be of good and uniform quality. The only failures traced to the metal reinforcement were cases of careless welding at critical points. Inadequate centering and inferior quality timbering have also been responsible for failures, and the use of sea-water; (6) careless or inexperienced workmanship has resulted in some early failures; (7) failures have occurred by over--training and weakening by applying the test load before the concrete has had time to thoroughly harden, or by the early use of a floor, for instance, up to the maximum load for which it has been designed; (8) a valuable property of reinforced concrete construction is that a finished properly designed structure gives ample warning before giving way.

Far from thinking that the rivalry and commercial competition of specialist contractors might result possibly in undue cutting of the design and the taking of risks, Mr. Colby uses their institution in Europe as an argument in favour of sperior workmanship, his contention being that competition results in them giving careful attention to materials and workmanship, while the former practice of obtaining the designs from some specialist of high standing and then assigning the work to the lowest bidder in open competition is eliminated. This is an argument that we have constantly used ourselves, and we are glad to see it backed by the opinion of a consulting engineer, who represents, if anything, those who are inclined to be opposed to reinforced concrete. The latter system of construction is one that requires considerable knowledge, care, and organisation, and we do not believe it will be an advantage, either on the score of economy or as regards efficiency, for reinforced concrete to be designed by the engineering and architectural professions generally. Such designs should be in the hands of specialists, and we believe that they always will be, because the intricacies of reinforced concrete design are so considerable that the ordinary general practitioner cannot possibly hope to master them. There is every tendency in the direction of specialisation in this modern age, and it is unlikely that the specialists will be reduced in the future. Specialist firms however they may be railed against by a few professional men who are endeavouring to advertise themselves and seeking their own interests, deserve great praise for their enterprise, and the care and attention they have bestowed upon the development of reinforced concrete in the past. Far from wishing to see the present methods of contracting for reinforced concrete greatly altered and done away with, we believe it to be to the best interests of the public, and the architectural and engineering profession, for this system of entrusting work to specialist contractors to continue. We believe that only in that direction lies safety and economy.

The book contains a very complete list of all the special systems upon the market in each of the different countries, with a short description of each, also list of the special kinds of reinforcements, summaries of Government regulations in each country, specifications for materials, list of foreign Government and private testing stations, technical institutions, etc., and a bibliography of reinforced concrete and cement. The list of applications of reinforced concrete contained in the front of the book is very considerable and very striking. It appears to have been put to 88 separate purposes, and no doubt it would be possible to extend the list.

The only criticism we have to offer upon the book is that in some cases the quotations from various sources are not quite correct, the punctuation being such as to somewhat alter the sense, while the translations from other languages into English are often in error, so as to make the paragraphs read entirely opposite to the sense of the original. But these errors will be obvious to the expert, therefore are not so very important.

We note that the number of foreign systems is 144, and we are surprised to see that there are 22 systems of English origin, and 13 other systems of foreign origin in use in England. Of the 22 English systems, six use special forms of bar for reinforcement, the other sixteen use rounds, squares, flat and standard structural shapes, while two of the 16 use a patented stirrup or clip. Among the systems in use on the Continent there are 54 systems of German origin, 21 of French origin, six from Austria, and six from Italy. There are thus quite a multitude of systems, and in reading through the list one is drawn forcibly to the fact that the majority of the systems are very much alike, and that the ordinary system is not so much a novel method of doing the work, but the particular collection of methods and manner of working adopted by each specialist. There are thus as many "systems" as there are specialists.

"Reinforced Concrete in Europe," by Albert Ladd Colby, M.Am.Soc.C.E., M.Am.Soc.M.E., etc. United States: The Chemical Publishing Co., Easton, Pa. London: Williams and Norgate, 14, Henrietta Street, Covent Garden, W.C. Price $3·50.

Federation News.

Northern Counties Federation.

A quarterly meeting of the Board of Representatives of the Northern Counties Federation was held at the Queen's Hotel, Stockton-on-Tees, on Thursday, September 23, Mr. J. Davison presiding, when 36 representatives were present.

The minutes of the quarterly meeting of the Board held at South Shields on Thursday, July 8th, were signed by the president as correct.

The secretary gave a report upon the agreement for working rules with the N.A.O.P., which had now been signed by all parties.

The recommendations passed by the Executive Council with respect to the invitation to be extended to the National Federation to visit the Northern Counties in the summer of 1911 were considered, and it was resolved unanimously to adopt the recommendations.

The Executive Council's report upon the question of the uniformity of working hours on Teesside was received. That Association further reported that their negotiations with the operatives have proved fruitless owing to their refusing to increase the Hartlepool labourers' wage by ¼d. The amount proposed to be given to Middlesbrough and Stockton was at present ¼d. below Hartlepool rate. Formal notice according to rule had subsequently been given the operatives for alteration to the working rules, and notice of ¼d. per hour reduction of Hartlepool labourers, so as to place them on the same rate as Stockton and Middlesbrough. Counter notices had been received for advance of wages as follows: Hartlepool, Stockton and Middlesbrough labourers, ½d. per hour; Hartlepool bricklayers, 1d. per hour advance, and alteration of overtime rule and working hours.

After considerable discussion on the matter, it was resolved unanimously, on the proposition of Mr. T. Wilkinson, seconded by Mr. W. M. Thompson, "that the consent of the Federation be given to the Teesside Association to give notice for the alteration of the working hours and reduction of the wages of the operatives within the area governed by the Association with the object of securing uniformity of working hours."

The resolution received from the National Federation asking the members to refrain from sending in priced schedules with their tenders was considered. It was pointed out that the effect of this resolution is in operation in the Federation's area. After further discussion, it was unanimously resolved, on the proposition of Mr. Alex. Ross, "that a circular be drawn up and forwarded to each member of the Federation asking them to refrain from sending priced schedules in along with their tender, and to report any infringement to the secretary of the Federation."

With a view to collecting statistical information likely to be useful to the National Federation generally, the Administrative Committee again issued forms requesting a return of the number of members in the respective associations, and also the number of men and apprentices employed in the various trades in June, 1909. The response made by the local associations was very incomplete, although frequent applications have been made, and the secretary complained of the slackness of members in affording information.

The secretary's attention had been drawn to a recent article which appeared in the "Builders' Journal," and subsequent correspondence thereon, upon the question of Builders' Locked-up Capital, dealing with the unduly protracted delay in payment and final settlement. It was pointed out that by the National form of contract provision is made for payments, and that contractors should insist upon strict adherence to its conditions. After further discussion, it was resolved "to leave the matter in the hands of the secretary."

The National Conference of Secretaries to be held in Leeds on October 19th was discussed, and, on the proposition of Mr. J. W. White, seconded by Mr. Jos. Pelton, it was resolved "that the secretary of the Federation attend the Conference, and that the local associations be invited to send their secretaries."

The question of holding a Federation dinner was discussed, and that of selecting the town for the annual meeting of the Federation. The President of the Sunderland Association pointed out that the next visit was due at Sunderland, and said that in the event of that town being selected it was the intention of the Sunderland Association to invite the members of the Board of Representatives to their annual dinner, which would be held on the evening of the day of the Federation visit. He moved accordingly, and the resolution was seconded by Mr. J. T. Armstrong, and agreed to unanimously.

The advisability of issuing a Federation year-book was discussed, and it was resolved to refer the question to the consideration of the Executive Council.

It was reported that clause 30 of this Bill, calling for a survey every 5 years of dwellings below a certain rental, and the provision of a public register of their condition of repair, etc., has been struck out.

A letter from the Sunderland Association was read, drawing attention to the fact that the Durham County Council had specified a particular stone, thereby restricting competition to one particular firm and excluding Durham County stone from competition. It was resolved "that a letter be sent to the Durham County Council urging the desirability of giving a preference to this county's products, and that a copy of the communication be forwarded to each member of the Council."

An enquiry asked the practice as to handing over the final certificate. The secretary was directed to reply stating that it is the general practice in the North to forward the certificate to the contractor in accordance with the provision made by clause 30 of the National form.

A report was received upon the decision in the case of Blackwell and Co. v. The Derbv Corporation, which appeared in the "Derby Advertiser" of August 6th, where the Court of Appeal had allowed the application of the contractor to bring to the court for settlement a dispute with the corporation arising out of a contract in respect of which all disputes were referred to the arbitration of the corporation engineer.

Previous to the meeting, the members were entertained to tea by the Stockton Association, to whom a hearty vote of thanks was accorded for their hospitality.—W. H. HOPE, solicitor, secretary, Post-office Chambers, 14, Norfolk Street, Sunderland.

SOCIETIES' REPORTS.

Institution of Municipal Engineers.

Arrangements have been made with the Associated Portland Cement Manufacturers (1900), Limited, for the members of this institution to visit the company's works at Northfleet, on Saturday, October 16. The train leaves Cannon Street Station (S.E. and Chatham Rly.) at 11.42 a.m., calling at London Bridge Station, at 11.45. Arrived at Northfleet station, the party will walk to the adjacent factory hall, where they will be entertained at luncheon. At 2 p.m., special tram cars will leave the hall for Swanscombe Works. Visitors will be provided with dust-coats for use on the works, where the party will be divided into sections, each under the guidance of one of the company's officials, who will conduct them and explain the various processes: (1) The quarrying of the chalk on the properties of the company adjoining the works and the method of amalgamating the chalk and clay in the powerful wash mills and screening mills. The power house operating this section of the plant is driven by three Oechelhauser gas-engines, each of 400 h.p., which with four more engines of this type, driving grinding mills, have recently been installed at the works. (2) The slurry mixing and storage tanks, the largest having a capacity of 7,000 tons. These contain the mixture as pumped from the wash mills and before being delivered to the rotary kiln plant. (3) The rotary plant, which has a capacity of 7,000 tons of Portland cement per week, and consists of 16 kilns, each 130ft. in length. The two main steam-engines and generators of 1,000 h.p. capacity each, which provide the power for driving this and other sections of the works, will be seen in the engine-houses underneath the kiln floor. (4) Grinding Mills. The product from the rotary kilns, after passing through the cooling cylinders, is conveyed by means of transfer cars and an electric lift to the various grinding mills, where the clinker is reduced to a fine powder in preliminary ball mills and in tube mills for the final grinding. During the latter process the setting time

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of the cement is regulated to any required degree by means of the hydrating apparatus, which will be shown and explained. (5) The cask making department, capable of turning out over one million casks per annum. The party will then proceed by a special train of improvised cars over the works railway to the new reinforced concrete jetty which has recently been completed on the banks of the Thames about a mile from the factory. After inspecting the warehouses, the Mason gas-producer plant and the works testing-room, where the setting time, fineness and other characteristics of the cement coming from the various grinding mills are continually being checked, the party will rejoin the tram cars. After tea in the factory hall, there will be a demonstration of the gauging and testing of Portland cement, including determinations of setting time, soundness, fineness, gauging of briquettes for tensile strength and testing of specimens. There will also be an exhibition of scientific and other special apparatus for the examination of Portland cement.

A REINFORCED CONCRETE THEATRE.

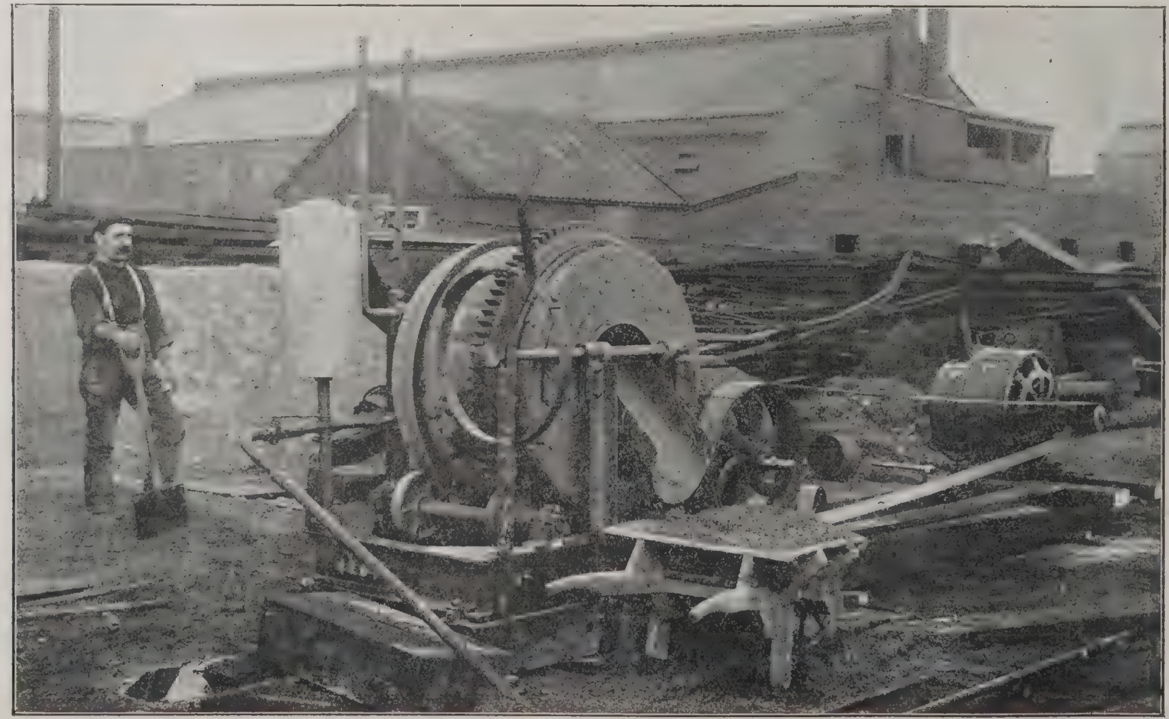
The little town of Agen in the department of Lot-et-Garonne, has achieved some distinction by the building of the first reinforced concrete theatre in France, the building being opened recently by the French President. The funds were bequeathed by a Mr. Ducourneau, after whom the theatre is named locally. The architect, Mr. Guillaume Tronchet, of Paris, is a native of Lot-et-Garonne, and it is significant of the manner in which these things are arranged in France, that the sculptors and painters employed to decorate the building are all natives of the same department. The builders were MM. Sainrapt and Brice, of Paris. The building rests on some fifty-four piles of lime concrete, varying in depth from 5 to 7 metres. On these rest the reinforced concrete beams that carry the superstructure. The principal facade is faced with Charentes freestone; while the side walls and part of the back wall are constructed of rough stone, rendered with a patent cement preparation, which is an excellent imitation of freestone. The stage walls are in ferro-concrete, 10 to 17 centimetres (about 4 to 7ins.) thick. Their height is 26 metres, ten below and sixteen above the stage level. The framework of the stage is of steel. All the dressing-room floors are of reinforced concrete 15 centimetres (about 6ins.) thick. The enclosing wall of the auditorium, the floors, corbel tables of the balconies, and the partitions between the boxes are also of ferro-concrete. The enclosing wall is 12 centimetres thick (about 4¾ins.), the floors 15 to 19 centimetres (about 6 to 7½ins.). The official tests showed a bending of barely 4-10ths of a millimetre at the most heavily loaded parts.

Trade and Craft.

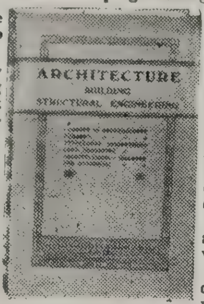
The Ransome Concrete Mixer.

The mixing machine for concrete has become a necessity of modern building methods. As we have repeatedly stated, a mixer is indispensable to ensure economy, rapidity, and standard production. The Ransome-ver Mehr Machinery Co., Caxton House, Westminster, have just issued a new and enlarged, well-illustrated and altogether finely produced catalogue, in which their mixer is effectively displayed, and its mechanism and operation are lucidly described. The drum is constructed of substantial steel plates riveted together, and revolves on two circular cast-iron roller paths riveted to it; and on the roller path nearest to the delivery chute is a cast-iron annular toothed rack, cast in one with the roller path. The frame is constructed of rolled or pressed steel channels, strongly connected together. Brass bearings bolted on the framing support the axles of the four cast-iron rollers, on which revolves the drum, with the two circular cast-iron roller paths riveted to it. The driving shaft, which is of steel, is also carried in brass bearings riveted to the frame, and a cast-steel pinion is keyed to the driving shaft. The fast-and-loose pulleys are of cast iron, and are keyed to the driving shaft on the side nearest the charging hopper. The discharge chute is made of steel plate, and is fixed in position by means of three vertical angle-irons, to the top of which are bolted cast brackets for carrying the quadrant and shaft by which the chute is supported and operated; these, and the lever for controlling the chute, are keyed to the shaft. Whilst the batch is being mixed, the chute is raised, and, by a simple lever movement, it is lowered to receive the concrete as it falls from the scoops, and thus directs the batch straight into the barrow or other vehicle; and the batch is discharged in five revolutions of the drum. The drum revolves continuously, and is lined with a series of steel scoops, which plough through the material over and over again, mixing it most uniformly and effectually and finally picking it up and discharging it. The stationary measuring hopper is constructed of steel plate; and the elevating hopper is so arranged that it can be lowered into a pit, or so that the bottom rests on the ground level. It will be seen from this brief description that the mixer is a thoroughly sound and strong piece of mechanism. Complete data, and copious illustrations are given in the catalogue under notice, which shows photographically, and by means of diagrams, all the component parts; while several views, from photographs taken at home and abroad, exhibit the Ransome mixer engaged in various interesting services.

The foundation-stone of Bethnal Green Municipal Buildings was laid on September 23rd by the Mayor, A. F. Barrard, J.P. The plans for the scheme were won in competition by Messrs. Robinson and Jones, of Leeds and London, theirs being considered by the assessor appointed by the Council, Mr. H. T. Hare, F.R.I.B.A., to be most suitable for the council's requirements. The elevations, one facing Cambridge Road, the other Patriot Square, are of Portland stone, and a Renaissance style has been adopted. The main entrance is in Cambridge Road, wherein the four principal offices of the borough will be located, viz., for the town clerk, borough treasurer, borough engineer, and surveyor, and the chief sanitary officer. The two former take up the front portion of the building, the latter being in the rear, which consists of offices. On the first floor are three large committee rooms and the mayor's room. The council chamber is situated on the north side, facing Patriot Square. There is a spacious public gallery, with access from the east end of the square. The contract for the erection of the building is in the hands of Messrs. Brand, Pettit and Co., and the entire costs will be about £26,000, inclusive of site and furniture, etc., £35,600. The clerk of the works is Mr. Archibald Brown.



THE RANSOME CONCRETE MIXER.



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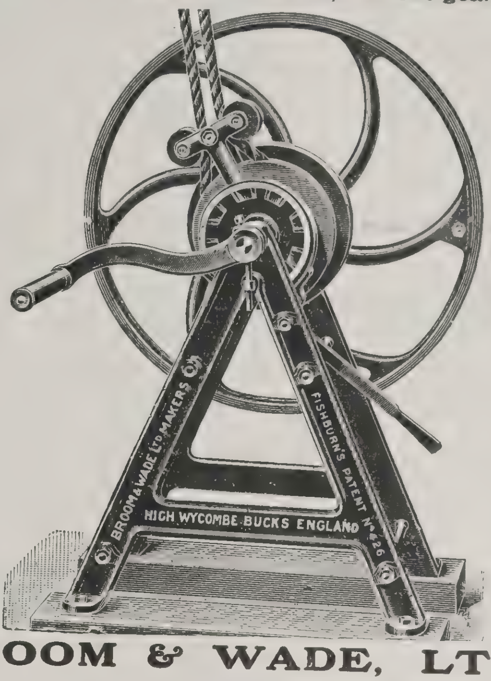

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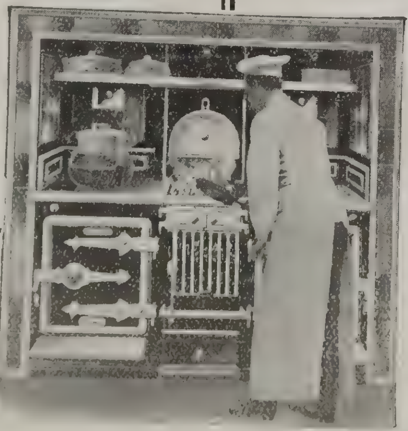

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Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Alphington (Exeter).—Accepted for erection of six cottages, residence, and business premises, for Messrs. Bowden, Ellis and Skanes. Mr. J. Archibald Lucas, A.R.I.B.A., architect, Guildhall Chambers, High Street, Exeter. Quantities by architect.

W. Harvey, 51, St. David's Hill, Exeter, £1,549.

Bowburn.—For erection of a small Wesleyan Methodist Chapel, etc., at Bowburn Colliery. Mr. J. Wilson Hays, architect, Wingate, Co. Durham:

M. R. Draper and Sons, Leamside	£625	0	0
J. Oliver, Wingate	582	13	0
G. W. Lazenby, Ferryhill ...	560	0	0
G. Wall, Ferryhill	551	19	7
Wood Bros., Brandon	521	0	0
T. Sanderson and Son, Coxhoe	504	17	5
J. Ponting, Shincliffe	494	4	0
T. H. Todd and Son, Appleton, Wiske, Northallerton	491	1	8
Makepeace and Vallis,* Trundon Colliery	490	17	0
Woods and Adams, Witton Gilbert	456	0	0

*Accepted subject to amendment, £488.

Rest of Co. Durham.

Burnley.—For the works in connection with proposed nurses' home and alterations at the infirmary, for the Guardians. Provisionally recommended for acceptance:—

M. and J. W. Heap, masons	£2,525	0	0
G. Smith and Sons (Burnley), Ltd., joiners	1,100	0	0
F. W. Shoesmith, plumber ...	410	0	0
M. Greenwood, painter ...	107	11	11
R. Guest, plasterer	175	14	0
W. Schofield and Son, slaters ...	139	14	6

Cambridge.—Accepted for erection of additions to the sewage pumping station, Riverside, Cambridge, for the Town Council.

Clark and Sons, Cambridge, £588 10s.

Cardiff.—Recommended for acceptance for enlargement and alterations at the Workhouse, Ely, for the Guardians of Cardiff Union.

J. Allan and Son, £3,931.

Eastbourne.—For alterations and additions to the premises of the London and Provincial Bank, Ltd., and work to temporary premises during rebuilding. Mr. Bertram Earp, architect, Eastbourne:—

Alterations, etc.

M. Martin and Sons	£2,485	10	0
Miller and Selmes	2,385	0	0
Peerless Dennis and Co. ...	2,126	0	0
J. Martin*	2,100	0	0

Temporary premises.

M. Martin and Sons	£120	0	0
Miller and Selmes	114	10	0
Peerles Dennis and Co.	114	10	0
J. Martin*	100	0	0

*Accepted.

East Kirby.—For the erection of branch stores, Diamond Avenue, East Kirby. Walter H. Woods, architect, High Street, Long Eaton, near Nottingham. Quantities by the architect.

John Beckett, Union Street, Mansfield	£710
W. Bains, Kirby-in-Ashfield	706
A. W. Hoole, Kirby-in-Ashfield	675
Stubbings and Fell, Sutton-in-Ashfield	670
T. Auld, Huthwaite, near Mansfield ...	641
John Tate and Son,* Annesley, Woodhouse	640
J. Greenwood, Mansfield	637

* Accepted.

East Orchard, Dorset.—For the erection of new piggeries, East Orchard, Dorset, for Rev. F. F. Penruddock, Burnham, Bucks. W. J. M. Morrish, architect, Gillingham, Dorset.

E. Short and Son, Shaftesbury...	£197	0	0
Hayward and Son, Blandford ...	195	0	0
H. Edwards, Fontmell Magna ...	194	0	0
E. A. Wright, Shaftesbury ...	188	10	0
A. Williams,* Shaftesbury ...	132	10	0

* Accepted.

Haverfordwest.—For erection of 14 brick-built houses at Prendergast under the provisions of the Housing of the Working Classes Acts, for the Haverfordwest Town Council. Mr. W. Bevan, borough surveyor:—

S. A. Scott, Milford Haven	£3,940
T. Williams, Letterston, Pem. ...	2,947
H. E. Rogers, Horn's Lane, Haverfordwest	2,702
J. Rees and Son, Narberth, Pem. ...	2,600
J. W. Jackson, Fishguard	2,560
T. Davies and Son and R. Williams,* Haverfordwest	2,464

Borough surveyor's estimate, £2,520.

*Accepted subject to the sanction of the Local Government Board.

(*Tenders continued on page viii.*)

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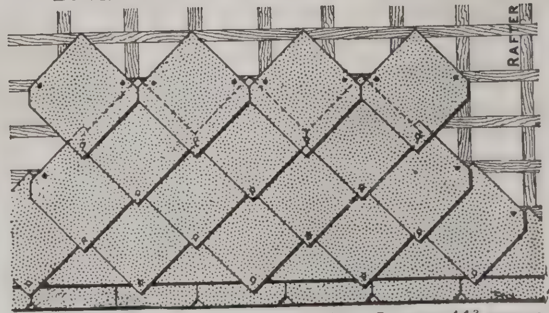

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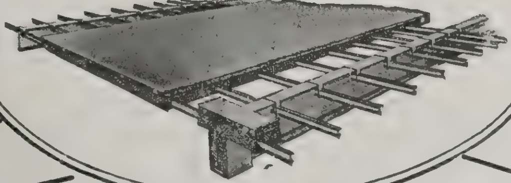

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(Tenders continued from page vi.)

...**Frodsham.**—Accepted for skating rink at the "Belle-Monte" pleasure grounds, Overton Hills, Frodsham, for Mrs. Parker-Hoose. Mr. Samuel Davies, M.S.A., architect, Frodsham.

George Gleave, Frodsham.

Harton (Durham).—For alterations, etc., to the Harton branch of the Boldon Co-operative Society, Ltd. Mr. Charles W. Bell, architect, 17, Norfolk Street, Sunderland. Quantities by the architect:—

J. Taylor	£596	0	0
J. M. Wright	595	5	0
J. Johnson and Sons, Ltd.	576	15	8
J. Davidson	571	6	9
Ridley and Crawford	554	7	8
R. C. Brown	552	7	0
W. G. Knott	547	14	8
A. Wilkinson	547	0	0
J. and T. Parker,* Sunderland	517	0	0

*Accepted.

London.—For the erection of foundations, etc., required in connection with the installation at the Elephant and Castle sub-station of two 1.500 k.w. rotary converters, for the L.C.C.

G. Munday and Sons, Trinity Square, E.C.	£1,125
Leslie and Co., Limited, Kensington	1,035
Holloway Brothers (London), Limited, Lambeth	865
Charles Wall, Limited, Lloyds Avenue, E.C.	826
H. L. Holloway,* Deptford	743

Architect's estimate, £982.

*Accepted.

London.—Provision of choke coils, etc., to be fitted to 25 of the existing motor generators at the Council's tramways sub-stations, for the L.C.C.

British Westinghouse Electric and Manufacturing Company, Limited, Manchester	£2,706	4	0
British Westinghouse Electric and Manufacturing Company, Limited, Manchester (1st alternative tender)	2.511	4	0
Dick, Kerr and Co., Limited, Abchurch Yard, E.C.	1,923	3	9
British Westinghouse Electric and Manufacturing Company, Limited, Manchester (2nd alternative tender)	1,821	4	0
Ferranti, Limited, Hollinwood (alternative tender)	1,768	10	8
Ferranti, Limited, Hollinwood	1,761	10	8
British Westinghouse Electric and Manufacturing Company, Limited, Manchester (3rd alternative tender)	1,726	4	0
Spagnoletti, Limited, Goldhawk Works, W.	1,605	4	6
Estimate of the chief officer of tramways	1,500	0	0
Johnson and Phillips, Limited, Charlton, Kent	1,437	8	5
Dick, Kerr and Co., Limited, Abchurch Yard, E.C. (alternative tender)	1,298	3	9
Electric Construction Company, Limited,* Wolverhampton	1,098	9	5

*Accepted.

London.—For the execution of the necessary alterations to the bridge carrying Lower Road, Deptford, over the East London Railway, for the L.C.C.

G. Shellabear and Sons, Plymouth	£22,671	2	0
Daniel T. Jackson, Barking	19,445	12	9
A. N. Coles, Paddington, W.	19,406	17	9
John Mowlem and Co., Ltd., Westminster, S.W.	18,152	0	0
Thos. W. Pedrette, Enfield	15,864	6	6
Anthony Fasey and Son, Leytonstone	15,835	18	0
Cleveland Bridge and Engineering Company, Ltd., Darlington	15,759	14	2
Geo. Palmer, Neath	15,490	11	8
Henry Woodham and Sons, Catford, S.E.	15,084	18	4
Westminster Construction Company, Limited, Westminster, S.W.	14,797	14	6
Dick, Kerr and Co., Limited, Abchurch Yard, E.C.	14,772	19	5
Alexander Findlay and Co., Limited, Motherwell	14,686	12	6
John Cochrane and Sons, Victoria Street, S.W.	14,685	18	2
Alfred Thorne and Sons, Carteret Street, S.W.	14,574	8	0
Mitchell Bros. (Contractors), Limited, Victoria Street, S.W.	14,332	3	6
E. Bentley and Son, Leicester	14,149	15	2
H. V. Smith and Co., Limited, Victoria Street, S.W.	14,018	9	1
W. Muirhead and Co., Queen Victoria Street, E.C.	13,120	14	0
R. C. Brebner and Co., Edinburgh	13,380	0	10
Rowlingsons and Co.,* Quality Court, E.C.	12,872	13	6
Montague Dinnie, Lightwood Glen, Buxton	12,641	0	1

Estimate of the chief engineer, £13,000.

*Accepted.

Lougher, (Wales.)—For the erection of a Congregational chapel schoolroom at Loughor, also for a dwelling-house, on the site adjoining:—

Schoolroom.

J. Jenkins, High Street, Gorseinon	£543	0	0
Lloyd Bros., Argyle Steam Joinery Works, Swansea	497	0	0
G. Mercer, Llanelly	487	10	0
Thomas and Thomas, Loughor	478	0	0
B. Howell and Son, Llanelly	455	0	0
T. Davies,* Heathfield, Swansea	367	0	0

Villa.

Lloyd Bros.	£814	0	0
B. Howell and Son	752	0	0
J. Jenkins	675	0	0
G. Mercer	670	0	0
Thomas and Thomas	598	10	0
T. Davies*	557	0	0

*Accepted.

Porth.—For extensions and alterations to the Cymmer Colliery Workmen's Library, Porth, for the Committee. Mr. Edwin Jones, F.I.A.S., Porth, Glam., architect. Quantities by architect:—

D. Davies and Sons, Trade Street, Penarth Road	£1,293	0	0
D. Richards, Ynyshir, Rhondda	1,290	0	0
— Isaccas, Ynyshir, Rhondda	1,250	0	0
Blundell and Bevan, Blackwood, Mon.	1,219	0	0
G. Halett, Partridge Road	1,130	0	0
C. Jenkins and Son, Porth, Rhondda	1,098	0	0
E. R. Evans Bros.,* Cathays	1,049	0	0
E. D. W. Evans, Tudor Road	999	0	0

Architect's estimate, £1,235 5s. 2d.

Steel work and fireproof floors.

Howard and Co.,* 106, Leadenhall Street, London, E.C.	£284	13	0

*Accepted.

Rest of Cardiff.

Southport (Lancs.).—Accepted for erection of a new Bickerstaffe pumping station, power house, offices, cottage, and boundary wall, for the Southport Water Board. Messrs. H. Rofe and Son, engineers, Westminster, S.W.

Parker and Sharp, Peasehorne Green, York, about £17,000.

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October 20, 1909.

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THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

This issue contains the Official Reports of the National Building Trades Federation, and articles of special interest to Builders and Contractors.

Caxton House. Westminster.

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Workmen's Credentials. In discussing relief for the unemployed, a Dundee newspaper has unwittingly revived an old controversy. The writer thinks that the Dundee masons "are building better than they know in suggesting that the corporations and distress committees should recognise membership cards of trades unions as guarantees of the position of applicants for work," because "some of the most successful labour bureaus in England have been worked on the principle of requesting the exhibition of membership cards of trades unions or of credentials from employers showing work records." The writer goes on to suggest that "under the existing conditions of employment and unemployment, all wage-earners should be furnished with work record cards similar to the credentials carried by seamen;" when many of the difficulties of distress committees would disappear. It so happens, however, that while the English trade unionist is rather proud of producing his trade card upon any and every occasion, he has a curious objection to employers' credentials. It is, we believe, a matter of history that in the early days of the Operative Bricklayers' Society the men revolted against employers' credentials, flatly refusing to produce them when applying for work. Traditional prejudices like this die hard; and we have reason to believe that the bricklayers, at all events, still entertain a strong aversion to employers' cards. The objection, however, appears to be against compulsory certificates of character and competency, which, they allege, were subject to grave abuse. It might not hold good with regard to cards voluntarily sought upon urgent occasion.

Responsibility for Dry Rot. Dry rot is becoming a haunting menace to architects and builders. In yet another law case they have been held responsible for its ravages, the jury in a case that was concluded in the High Court on Thursday last having awarded £165 damages to a gentleman who claimed that he had suffered to this extent by the negligence of defendants in the way in which they put in pugging in the nursery floors of Greenstead Hall, Halstead. It was alleged that the pugging not being properly dry before being covered with the floorboards, which were tongued and grooved, caused dry rot, necessitating repairs that cost £125, and plaintiff claimed forty guineas for being consequently kept out of his residence for four weeks. It will be seen, therefore, that he got the full amount of his claim, minus the difference between pounds and guineas in the compensation for disturbance. In arriving at this decision, both the judge (Mr. Justice Grantham) and the jury, seeing that the plaintiff had indisputably suffered damage and inconvenience, thought that the architects and the builders ought to have prevented it. This is a very natural view to take. It is nevertheless a superficial view. Too much importance appears to us to have been attached to the alleged (but disputed) dampness of the pugging, and too little to the floor having been, by the client's order, covered with floorcloth, cemented with "stickphast." The judge, in reviewing the evidence, pointed out that "some of the defendants' witnesses said ventilation was necessary, while others said it was not. When expert witnesses talked that way," he said, "then the jury must use their common sense. Every one knew," he added, "that one of the causes of dry rot was dampness without ventilation. Was not that the case in the present instance?" We submit that the answer to that question does not solve the problem. The crucial question is, Why was ventilation deficient? and very possibly the correct answer is, Because the pores of the wood were choked. And that where transpiration is stopped, dampness is bound to occur, is, or should be, a matter of common knowledge. The moisture may be residual in the materials, or it may be condensed from the atmosphere. If absorbed from the room below, it gathers under an air-tight floor, there, with warmth from above and below, and with no through circulation of air, the fungus of dry rot flourishes and spreads. These three conditions—moisture, warmth, and stagnation—are essential to its life and propagation. Several witnesses maintained—though apparently the judge and jury thought otherwise—that in this case the third condition was supplied when the floor was rendered impervious. For this condition, it appears, neither the architects nor the builders were responsible. We cannot help thinking, therefore, that to make them pay for the damage is to inflict on them an unmerited hardship. We have no interest whatever in this particular case, or in any of the parties to it. We comment upon it simply because we feel that it affords a precedent for imposing on architects and on builders an unfair burden of responsibility. Granted that the client has in every case a right to expect competency and care, and that he should have a remedy for incompetence or negligence, yet these faults should be absolutely proved before exacting the penalty. Granted that it is incumbent on architects and builders to see that the timber they put in is sound, and that the structural conditions are such as shall not favour the development of the fungus, yet they should not necessarily be held responsible for every case that arises, because the disease may break out from causes that are beyond their control. We feel, therefore, that architects and builders should immediately take steps to protect themselves against the dangerous assumption (to which the result of this action lends weight) that they are in every instance responsible for the ravages of dry rot. They are bound to do all in their power to prevent it; but it should be clearly recognised that this disease of timber is obscure, insidious, and may break out in spite of the utmost skill and foresight, while the exciting cause may be due to circumstances with which the architects and builders have had nothing whatever to do, and for which they cannot justly be held responsible. The tendency to hold them responsible in every case should be resisted; and, during the past few years, the matter has gone so hardly with them in the courts that we think it ought to be set upon a more equitable basis. The first step is to ascertain, collect, and collate all the available data and evidence. It might then be possible to define the conditions in which architects and builders are, or are not, responsible for the ravages of dry rot; and it might be desirable to devise a saving clause for insertion in contracts, defining and limiting responsibilities that have become extravagant and intolerable. Here is work that the Royal Institute should promptly take in hand with the same thoroughness with which they have carried out other investigations for which the entire community of builders is grateful to them; for it is a subject in which the interests of architects and builders are in need of protection, and it is time that a firm stand should be made.

The Development and Housing Bills.

The Development and Roads Improvement Bill, which was explained by Earl Carrington as having for its objects to aid and encourage agriculture and rural industries, including forestry, reclamation and drainage of land, improvement of rural transport, the construction and improvement of inland navigation and harbours, and the establishment of a Road Board for the whole of the United Kingdom, was read a second time in the House of Lords on Thursday last. The duties of the Board would be to administer what is called in the Bill the Road Grant, which will be the £600,000, more or less, which in the Budget is supposed to be obtained from the motor and motor spirit taxes. The money will be spent in the construction of new roads or in the formation of existing roads; but the Road Board will only construct or maintain new roads. The Bill gives the Board power to take, besides the land necessary for the road, 220 yards on each side of it, so that "money spent by the State for public utility, comfort, and safety, should not be used to develop the estates of individual owners." In Committee, the Bill, Lord Lansdowne drily remarked, is likely to be rendered "a little less ambitious." The Lords should by this time have become quite expert in the gentle are of checking vaulting ambition of this kind, the Housing and Town Planning Bill, which they had passed on October 11th, having been rendered almost unenterprising in comparison with the state in which it left the Commons, although the Government do not seem strongly disposed to endorse Lord Crewe's view that if the Earl of Malmesbury's amendment—giving power to award just compensation to an owner whose property is deemed by the arbitrator to be injuriously affected by the operations of a town-planning scheme—were carried, it would be absolutely impossible to proceed with the Bill. The amendment was carried by 80 to 14, and as yet the Bill has not been abandoned! To say that the Bill has been ruined in its passage through the Lords is to betray an excess of political prejudice. It has certainly been clipped and trimmed pretty closely, but without detriment to its root principles.

San Francisco's Simultaneousness

The Portola Festival began yesterday. It is called Portola because the Spanish general of that name discovered San Francisco in 1769, and was the first Governor of California. If he had never discovered it, perhaps fire following an earthquake would never have "wiped it out"—or, alternatively, perhaps this festival would have borne some other name. No matter how it is called, it is certainly a great occasion. Rather more than three years ago, San Francisco was a heap of blackened ruins, and even its richest men were "standing in the bread-line, drawing rations." To-day, a brand-new San Francisco, rebuilt in three years, at a cost of some forty million pounds sterling, is celebrating its resuscitation. The festival is to last from October 19 to October 23, and there are parades, banquets, and pageants toward. Yesterday was adopted the great idea of the simultaneous universal toast. At noon, San Francisco time, yesterday, President Taft raised his glass, "To the American spirit of enterprise, courage, and energy, that made possible the rebuilding of a city in three years," and to that toast a glass was raised "wherever an American was to be found," although there must have been occasionally some difficulty in calculating the correct moment. In London, noon of San Francisco was represented by 8 p.m. It was a curious observance, but not without its value both emotional and practical—the typical blend of the American people. We trust that San Francisco's experiences of simultaneous toasting may never be less pleasant. We have no doubt that, on the whole, the buildings that have been reared in so short a time are æsthetically worthy of the temperament and the toast. We trust that at any rate they will be so well adapted to their environment as to defy earthquake and fire, and thus render unnecessary any repetition of the tremendous feat of entirely rebuilding a great city in three years. Like the toast, it was a wholesale order. Rebuilt San Francisco will perhaps be worth studying from the point of view of the town planner.

The Question of Quantities.

The quantities question is, we believe, approaching something like a crisis. Builders and contractors are growing weary of the heavy burden that is unfairly imposed upon them when they are required to take out the quantities for works for which tenders are desired. To ask a builder to do this is to ask him to undertake another man's work and to incur out-of-pocket expenses upon which it is many chances to one that he will get no return. If he does not secure the contract, he will realise a dead loss on the cost of getting out the quantities. If there are fifty builders tendering under these iniquitous conditions, forty-nine of them will suffer this dead loss. The substance of forty-nine builders must be callously wasted, because the architect or his client is too indolent or too short-sightedly selfish to provide the necessary data for the estimate. What, after all, does the client really save by this policy? No more than the paltry cost of duplicating the copies of the bills; for it is to be presumed that the charge of getting out the quantities will be included in the amount of the successful tender; but those who are unsuccessful tenderers must lose it with the job, realising a loss upon a loss. And the loss is multiplied for the trade by the number of the builders tendering. They lose a good deal over the mere preparation of the estimates. The system is at best but wasteful. It need not be rendered additionally abhorrent by the imposition of this quite unnecessary burden, which wastefully and extravagantly increases the general cost of building by adding to inevitable charges a considerable item many times magnified. Why demand such quantities of quantities, when one set, properly manifolded, would be ample and comparatively inexpensive? The method is wrong because uneconomical. It is wrong for other reasons. It hampers and harasses the builder in his preparation of the tenders. It multiples not only labour and expense, but the chances of error, and it shifts on to the shoulders of the contractor the responsibility for that error. Moreover, this ill-advised practice deprives the competitors of the common basis for tendering which would place them all, to this extent at least, on an equal footing. It robs them of a fair start and produces a set of tenders entirely misleading to the client, who finds it impossible really to appraise their respective relative values because of the different views taken of the work by the various surveyors who have made up the various quantities. In the North, contractors have made a strong stand against this iniquity. In the South, we regret to have observed a tendency to tame submission to it. Some of the bigger firms, we have been told in terms that are perhaps more graphic than polite, keep a tame quantity surveyor on the premises, but we understand that this ignoble attitude is likely to be abandoned. The evil has become too gross for further toleration, and important steps are being taken to put an end to it. We print, in another part of the present issue, a brief statement showing the trend of a movement that should tend towards amelioration. The position of the quantity surveyors is curious. If, by means of the reform advocated, fewer sets of priced quantities are required, quantity surveyors will get less work to do; and yet, realising this very clearly, they are, we understand, prepared to support the movement as a matter of pure principle. Theirs is an eminently honourable attitude. Needless to say, we shall watch that movement with intense interest, and, so long as it goes in the right direction, shall give it our hearty support.

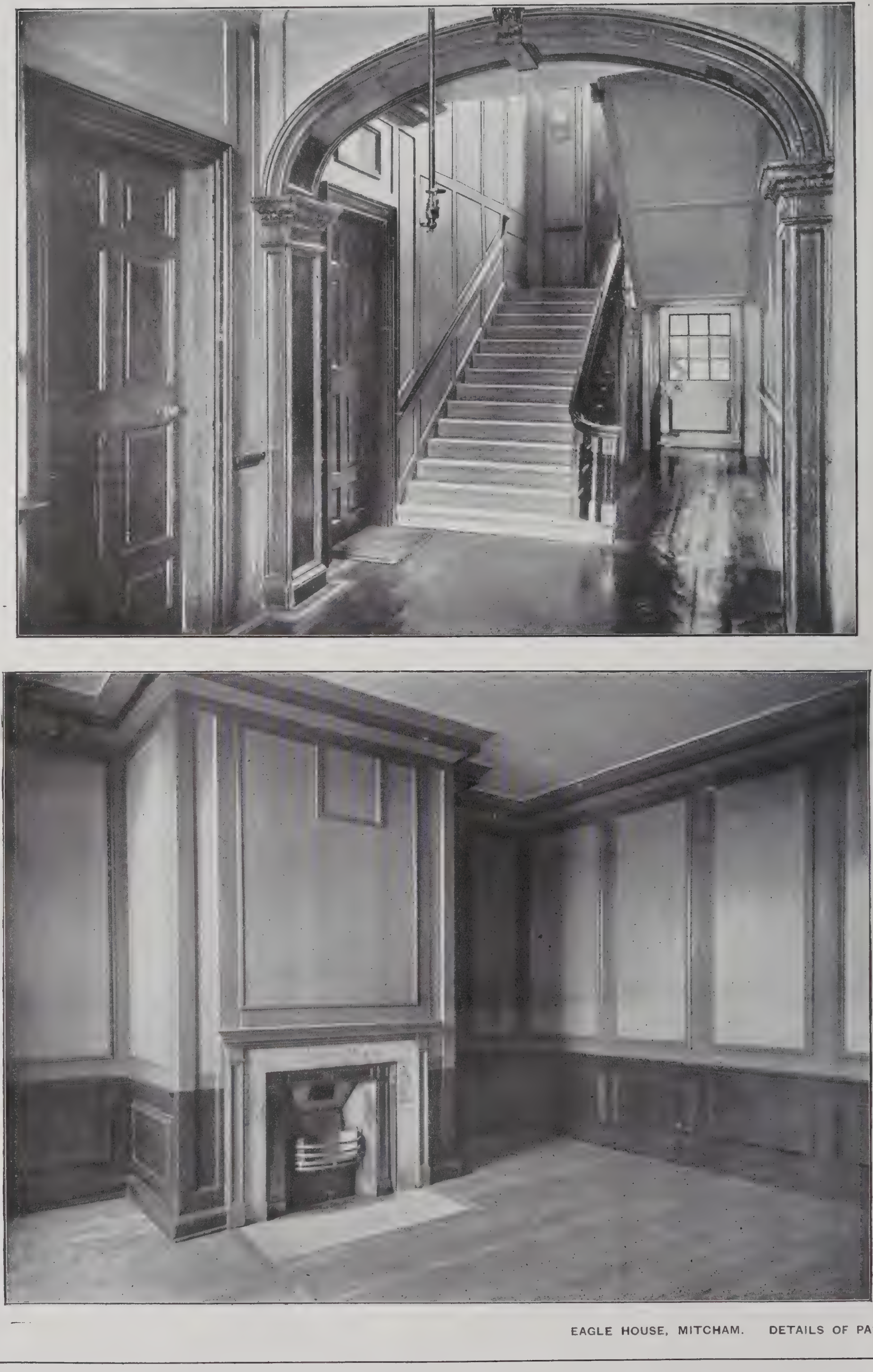
LONDON'S ROMAN WALL.

The excavations which were necessary for the foundations and sub-structure of the extensions of the General Post-office on the site of Christ's Hospital (Bluecoat) School brought to light a considerable run of the old Roman wall, which at one time practically encircled the city. Interesting evidence of the materials used in its building was brought within view. The Archæological Society took a considerable interest in what was disclosed, and came to the conclusion that further excavations would result in more important work being brought to light. For this purpose the Society obtained permission to continue the digging in an easterly direction, at the point where the wall was known to make a turn in the direction of the Old Bailey. Subsequently the footings of an ancient bastion have been revealed. It apparently had a diameter of about 25ft., and the probability is that a tower also existed on this spot. On the outer circle of the bastion the depth of the moat has been reached, and some remains of pottery and glass have been found there. The accompanying view illustrates the work as it stood at a recent date. The bastion was built somewhat differently from the wall (which was of alternate courses of stone and tile), stone only being seen in the bastion. The blocks vary somewhat in size, averaging about 15in. × 12in. × 6in. and were laid in lime. The work unearthed is certainly one of the most interesting sights relative to the ancient history of the City that have been seen of recent years, and the pity is that it cannot be kept permanently open.

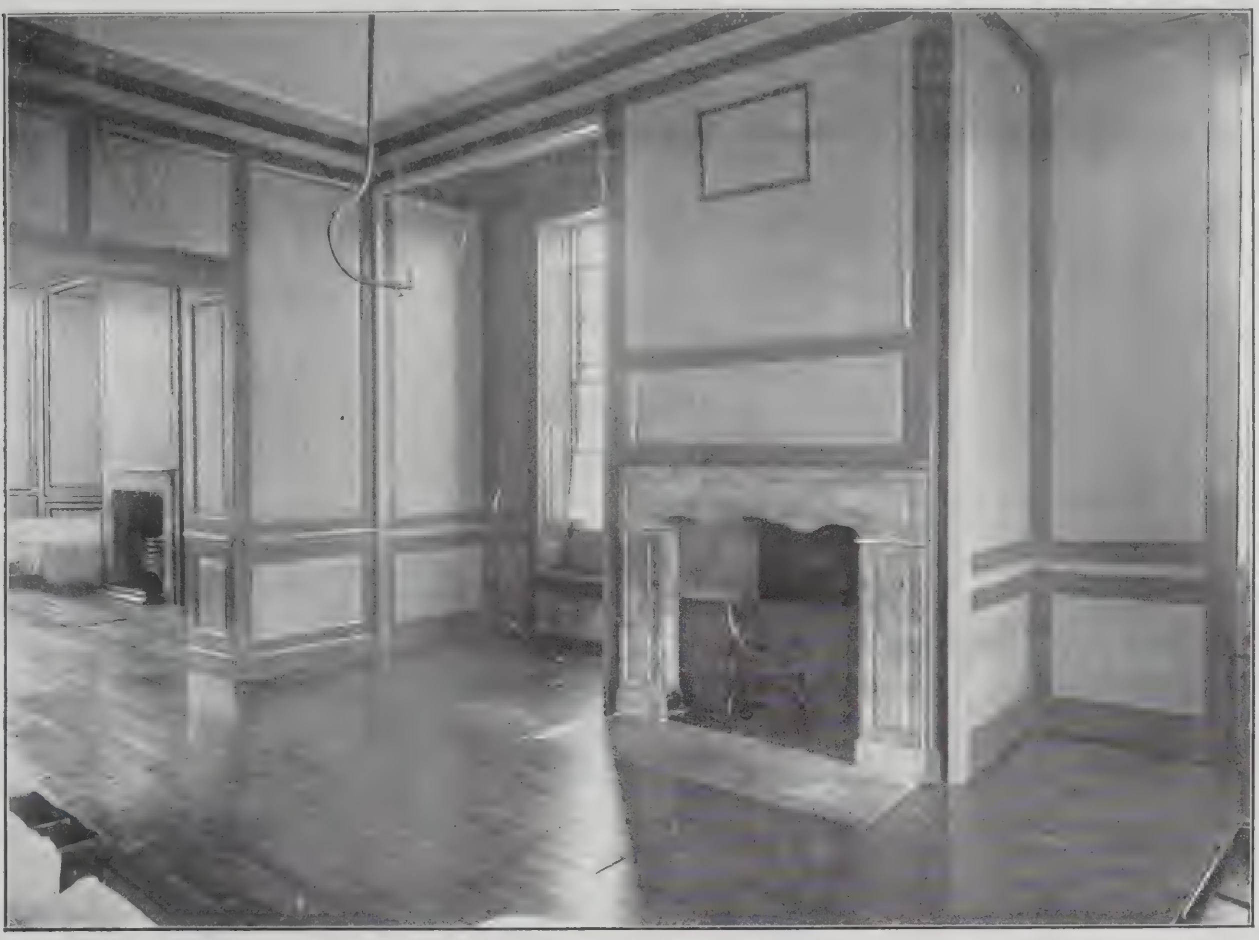
Our Plate.

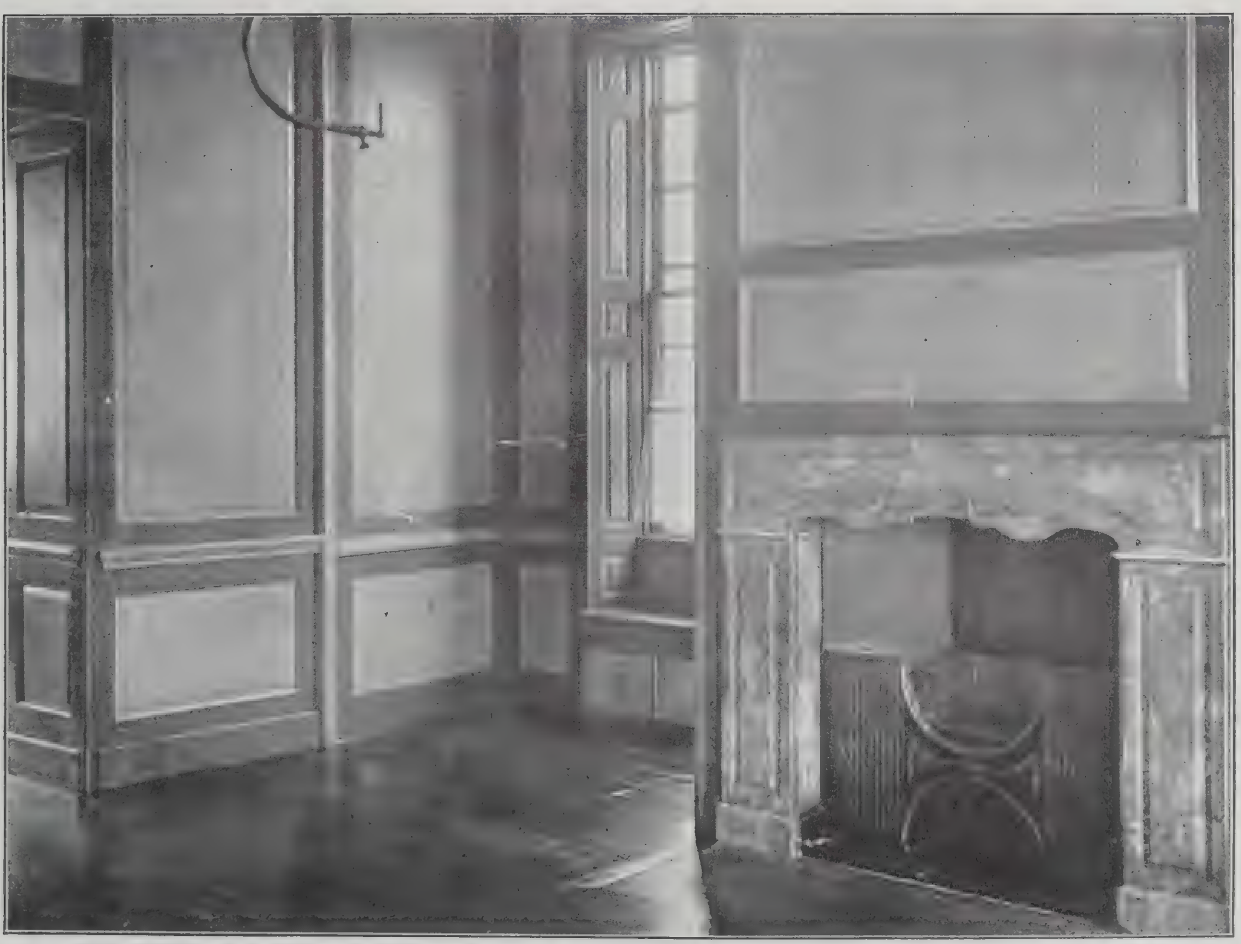
We give in our centre-plate the concluding illustration of Eagle House, Mitcham, with a measured drawing by Mr. Joseph Seddon on p. 306. This interesting old house is an excellent example of the roomy and comfortable dwellings of its period. The details shown in this issue include the panelling of the saloons, in which rooms the original grates still exist; also the panelling of the drawing-room and some details of the hall.

The death has occurred, at the age of 61, of the sculptor, M. Tony Noël, professor at the Paris Ecole des Beaux-Arts. M. Noël obtained the Prix de Rome in 1868. At the Universal Exhibition of 1889 he obtained a "Grand prix," and he was a member of the Conseil Supérieur de l'Enseignment des Beaux Arts.



EAGLE HOUSE, MITCHAM. DETAILS OF PANELL





TC., IN HALL, SALOONS AND DRAWING ROOM.

Photos: Darien Co.

Societies' Reports.

Architectural Association.

At the annual general meeting of the Architectural Association, held on October 8th, the following prize-list was presented:—

G. G. Wornum, A.A. Travelling Studentship, value £25, and medal; C. G. Boutcher, 2nd Prize, A.A. Travelling Studentship, value £5; H. F. Murrell, A.A. Essay Prize, value £10 10s., and silver medal; W. J. Durnford, Banister Fletcher Bursary, value £26 5s., and silver medal, Book Prize for first place Advanced Physics; L. M. Gotch, Architectural Union Company's Prize, value £20; B. F. Matthews, Hon. Mention, Architectural Union Company, and Special Prize, value £5 5s., Book Prize, 4th year Evening School; R. Cromie, Special Prize, Saxon Snell Studentship, value £10; W. D. Cathcart, Elementary Class of Design Prize, value £3 3s., and bronze medal; Alan Snow, Advanced Class of Design Prize, value £5 5s., and bronze medal; E. L. Apperley, 1st year Day School, Book Prize for 1st place in History Test Paper, Book Prize for 1st place in Construction Test Paper, Prize for 1st place in Perspective Drawing Test; R. C. Stevenson, 1st year Day School, Book Prize for 1st place in Construction Test Paper, Studio Prize for best portfolio of drawings during session; T. F. Ford, 1st year Day School, Book Prize for 1st place in Geometry; C. Rowntree, 1st year Day School, Book Prize for 1st place in Physics; A. E. Maxwell, 1st year Day School, volume of A.A. Sketch Book for 1st place in Freehand Drawing Test, Special Studio Prize; F. A. Crouch, 2nd year Day School, Travelling Studentship, value £15, Book Prize for 1st place in Intermediate Physics; H. B. Chishold, 2nd year Day School, 1st place in "End of Session Test"; D. J. S. Dawson, 2nd year Evening School, Scholarship, value £15 15s., Book Prize for 1st place in Preparatory Physics; H. D. Kidd, 2nd year Evening School, Book Prize; H. V. C. Curtis, 2nd year Evening School, Master's Prize; P. D. Hepworth, 3rd year Evening School, Studentship, value £15; H. E. Moss, 3rd year Evening School, Book Prize; H. A. Gold, 3rd year Evening School, Master's Prize; C. A. Farey, 4th year Evening School, Travelling Studentship, value £15; R. M. Pigott, 4th year Evening School, Master's Prize; Norman Keep, Book Prize for 1st place in Elementary Construction; G. H. Inman, Book Prize for 1st place in Geometry; G. M. Eaton, Book Prize for 1st place in Greek and Roman Architecture; R. N. Jackson, Book Prize for 1st place in Greek and Roman Architecture, Book Prize for 1st place in Renaissance Architecture; C. W. Rogers, Book Prize for 1st place in Early Christian and Gothic Architecture; P. J. Adams, Book Prize for 1st place in English Architecture, Book Prize for 1st place in Materials; H. A. Thomerson, Book Prize for 1st place in Drainage; G. Flint Clarkson, Book Prize for 1st place in Ventilation, Book Prize for 1st place in Iron and Steel Construction, Book Prize for 1st place in Advanced Construction, Book Prize for 1st place in Architectural Features, Book Prize for 1st place in Professional Practice.

The following students have been recommended by the visitor, Mr. Ernest Newton, for the Board of Architectural Education Certificate, which entitles them to exemption from the R.I.B.A. Intermediate Examination:—R. W. Cable, G. F. Clarkson, C. A. Farey, A. V. Sutherland Graeme, G. W. Home, G. D. Gordon Hake, L. Keir Hett, T. A. Lodge, B. F. Matthews, C. E. Fellowes Prynne, I. M. Pritchard, R. M. Piggott, A. D. Robinson, F. H. Swindells, E. J. Tanner.

The following students have been awarded the Association Two Years' Course Certificate:—E. S. A. Baynes, A. G. Butler, J. A. Cheston, H. B. Chisholm, F. A. Crouch, B. P. Gaymer, J. O. B. Hitch, L. D. Martyn, E. W. Mountford, C. W. Rogers, S. E. Shurmur, R. Talvalker.

Society of Architects.

The twenty-fifth annual report of the Council, which is to be presented at the meeting to be held to-morrow, shows that sixty members, two honorary members, and forty-two students, have been added to the register during the past twelve months, and two members have been transferred to the retired list; and after allowing for deaths, removals, and resignations, the total membership stands at one thousand, an increase of twenty-five over last year. As to registration, it was reported that although no progress has been made in Parliament with the Bill promoted by the Society, the registration movement has made great strides during the past year. Early in the session the Council was approached by the South African Branch for a donation towards the expenses to be incurred by the Transvaal Institute of Architects, in promoting a Bill for the Registration of Architects in that part of the Empire. The Council responded by at once sending a sum of £50, with an assurance that any further assistance which the Society could give would be at the disposal of the branch and of the Transvaal Institute. The Society's branch took up the matter energetically. The president of the branch, Mr. R. Howden, and the hon. secretary, Mr. E. H. Waugh, visited Cape Town and other centres, when reciprocity was arranged between the architects of different South African Colonies. The Transvaal Institute also worked hard in the same direction, with the result that a Bill was drafted and read a first time in the Assembly at Pretoria, at the end of June. It was then referred to a Select Committee, who, after hearing the evidence of the promoters, recommended the Bill for adoption by the House, and on July 7th the Bill was read a third time and passed without opposition. The share which the Society of Architects took in this matter has been most generously acknowledged by the Transvaal Institute of Architects. While the Transvaal architects were so successfully engaged, those at home were doing everything possible to bring about unanimity of purpose with the same object in view. The Institute of Architects in New South Wales is also actively taking the matter up, and has issued a petition with a view of strengthening its hands in approaching the Government. The Council is of opinion that the time is not far distant when some form of registration, on the lines so long advocated by the Society, will become an accomplished fact in the United Kingdom. The half-yearly examinations to qualify for membership have been held at London, Manchester, Johannesburg, Cardiff, and Oxford, the two latter being new centres.

The Society's certificate is accepted by the Transvaal Government as a qualification for registration as an architect, under the new Act. Several alterations have been made in the syllabus, the principal being that candidates failing to qualify in any subject shall be allowed to sit again at either of the next two examinations without further fee, and that "Contracts and Specifications" are now taken together. The time on these subjects and also on "Quantities and Prices" has been extended with a view of enabling candidates to do more justice to the subjects than hitherto. The Architectural Association Day School Course and the P.A.S.I. Certificate (Building Sub-division) are now accepted as exemptions in Sections I. and II. and Section IIIb. respectively. An increasing number of students avail themselves of the opportunity offered of qualifying for membership by stages, through the medium of the sectional examinations. The examination for the architectural scholarship, 1909, was held in London, in April last, but the Council was unable to award the scholarship. Early in the year a Committee was elected, which appointed Mr. H. V. M. Emerson, A.R.I.B.A. (Member of Council), as chairman, and Mr. H. Y. Margary (student) as hon. secretary. The committee has been very active and has made a number of suggestions for the development of the section, most of which the Council has been able to adopt. A feature of the work has been the very successful series of sketching parties, organised by Mr. H. Y. Margary and his committee, which took place as follows: May 15th, St. Albans, under the guidance of Mr. Chas. H. Ashdown, F.R.G.S.; June 11th, Hatfield House; July 17th, Mertham and Gatton; September 11th, Rochester, under the auspices of the president, Mr. G. E. Bond, J.P., who has offered a prize of the value of £3 3s. for the best work done during the first session by the students; and arrangements are being made for a "Students' Night" early in the new session, when the sketches and drawings will be exhibited. The Travelling Studentship Competition continues to attract a good deal of attention, twenty-five sets being received and adjudicated upon. The subject this year was a secondary school to accommodate 100 boys and 100 girls. Mr. Chas. H.

Photo: Bolak.

ROMAN BASTION WALL RECENTLY UNEARTHED IN THE CITY OF LONDON (*see opposite page*).

Hudson, of London, secured the first place, while the design of Mr. Geo. Ll. Evans (London) was placed second, and a special prize of £10 awarded to him by the Council. Mr. Hudson—who has been successful in other smaller students' competitions—selected Oxford for his touring centre, as did also Mr. Evans. Mr. Edgar M. Leest, J.P. (Member of Council), again offered a prize of the value of £3 3s. to be competed for by the students. The subject selected was "A Volunteer Fire Brigade Station for a Country Town," the competition being confined to students whose age did not exceed twenty-three on March 1st. Six sets of designs were received, but none were considered of sufficient merit to justify any award being made. The whole of the designs submitted in the Travelling Studentship and the Fire Brigade Station Competitions were on view in London during the first week in June, and a selection of the former were subsequently exhibited at Cardiff and Birmingham. The second year of the Correspondence Classes, which are in charge of Messrs. James Bartlett and Chas. H. Mead (members of the Council), came to a conclusion in June, when Mr. J. Pickup, of Blackburn, secured the Council's prize of £2 2s. for first place in the Advanced Class, Mr. D. H. H. Barry, of Eastbourne, being placed first in the elementary, taking the prize of £1 1s., which it may be remembered Mr. Pickup secured the previous year. It is proposed next session to offer prizes of the value of £1 1s., £2 2s., and £3 3s., to the students heading the lists in the first, second, and third years, respectively. The Council has gone with great care into the matter of unemployment assurance, and has decided that it is not advisable at present for the Society to attempt to deal with it.

Liverpool Architectural Society.

The report of the sixty-first session (1908-9) of the Liverpool Architectural Society, issued from 13, Harrington Street, Liverpool, states that the membership consists of 54 Fellows and 77 Associates—total 131—as compared with 56 and 69—total 125—last session. There are three hon. Fellows, nine hon. Associates, and 28 students. It is again noted that during the year the Council have been approached by the Manchester Society of Architects with a view to concerted action between the two societies with respect to architectural competitions. The Council have accordingly appointed a competitions committee to take action in the cases of competitions—more especially those belonging to the county of Lancaster; in which, in the judgment of the committee, the general conditions are not satisfactory, and the committee have taken action with respect to several competitions. In conjunction with the Manchester Society, a carefully worded and definite form of conditions of competition has been drafted, with the object of bringing about the general adoption of a recognised form of conditions of an equitable character. Particulars are given of the University of Liverpool Faculty of Arts, and there is an attractive list of prospective arrangements. The president is Mr. T. E. Eccles, F.R.I.B.A., and the hon. secs. are Mr. Gilbert W. Fraser, A.R.I.B.A., 20, Castle Street, and Mr. Ernest C. Aldridge, 14, Castle Street.

Cardiff, South Wales and Monmouthshire Architects' Society.

The members of the Cardiff, South Wales, and Monmouthshire Architects' Society (hon. secretary, Mr. G. A. Birkenhead, M.S.A., 102, St. Mary Street, Cardiff) have visited the new University College Buildings, and were shown over by the architect, Mr. W. D. Caröe, F.R.I.B.A., who pointed out various features, from the basement to the roof. The method of heating, ventilating, and lighting were explained, and various details of construction were pointed out. The members particularly admired the architectural features of the entrance hall, the splendid library, and the council room. At the end of a most enjoyable and interesting visit a hearty vote of thanks was tendered to Mr. Caröe upon the proposition of Mr. E. Seward, F.R.I.B.A., seconded by Mr. E. H. Fawckner, F.R.I.B.A.

Northern Architectural Association.

A party of about thirty members of the Northern Architectural Association assembled at Scotswood Council Schools, where Mr. Graham, the clerk of works to the Newcastle Education Committee, explained various matters of interest in the unavoidable absence of the architects, Messrs. Fenwicke and Watson. On leaving the schools the party proceeded to Denton Hall, which is a most interesting example of early seventeenth century domestic architecture, and contains many features of particular interest to architects. On arrival at the hall members were received by Mr. Forster Armstrong, who is now in residence at the hall, and who gave a most cordial welcome, and explained the many features of interest in the hall. After a careful inspection of the house and gardens, the party were hospitably entertained by Mr. Armstrong, who was accorded a hearty vote of thanks for his kindness. The meeting was the last one of the summer session, and the opening meeting of the winter session takes place on November 10th, when the president is to deliver his inaugural address.

London County Council School of Building.

The Prospectus and Time Table of the London County Council School of Building, Ferndale Road, Brixton, S.W., shows that the school is divided into three sections—namely, (1) Trades Classes; (2) Building Construction and Allied Subjects, and (3) Architecture and Drawing. The first section includes brickwork; carpentry and joinery, staircasing and handrailing, joiners' machine class; masonry; painting and decorating; plastering; plumbing, ornamental leadwork, iron pipe-work, etc.; sanitary engineering; stone carving, wood-carving, and modelling; and wrought ironwork. In the second section are comprised builders' book-keeping; builders' estimating; builders' office routine; building construction, mechanics of building, and constructional steelwork. In the third section are architectural design; details, and perspective drawing; architectural history; freehand and model drawing; lettering and inscriptions for drawings; sketching and measuring buildings and details. The principal of the staff is Mr. H. W. Richards, who has for assistant Mr. Arthur R. Sage; while the Director of Architecture is Professor Beresford Pite, F.R.I.B.A. There are ample facilities for workshop practice; and the building construction drawing office, as illustrated in the prospectus, appears to be large and convenient. There is also a day technical school for boys.

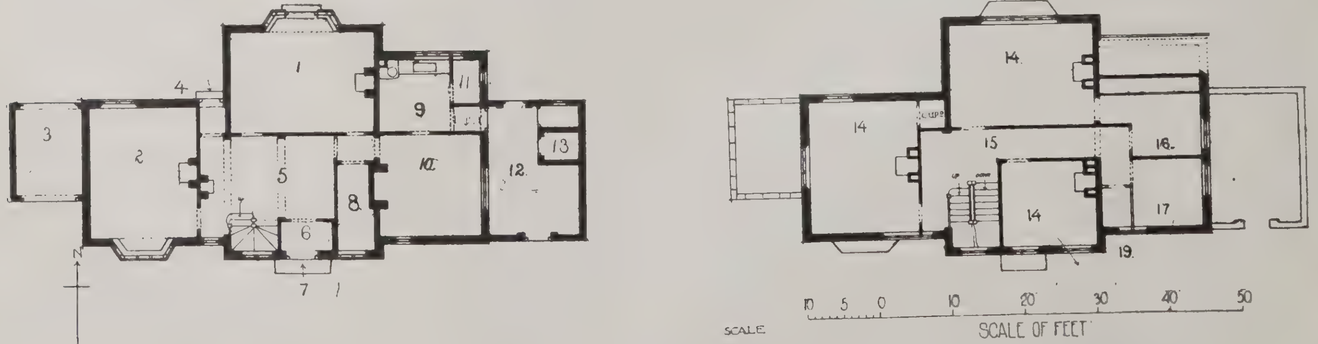
LIVERPOOL SCHOOL OF CIVIC DESIGN.

Appropriately, the prospectus of the Department of Civic Design in the University of Liverpool School of Architecture is of handsome and dignified appearance. It contains several plates; the frontispiece, by Prof. S. D. Adshead, showing a noble scheme for dealing with the approaches to the British Museum. Rather more ambitious and not less charming is the birds-eye view, by the same architect, of a proposed laying-out of St. Michael's and Fulwood Park, Liverpool. If some day these beautiful dreams are realised, the influence of the first Professor of Civic Design will be gratefully recalled.

In the introduction to the prospectus it is stated that the School of Civic Design owes its inception to the very evident demand which exists for a system of training in the broader aspects of architecture and engineering, and that it is the first organisation of its kind exclusively designed to meet the students who wish to study this subject. It is noted that town planning, although intimately connected with architecture and engineering, is a distinct and separate study in itself, and the primary object is to supply a knowledge of the supplementary subjects which town planning connotes, and to equip architects, engineers, and others, for the "advisory and permanent positions which must necessarily be created as legislation affecting civic development and extension becomes increasingly efficient."

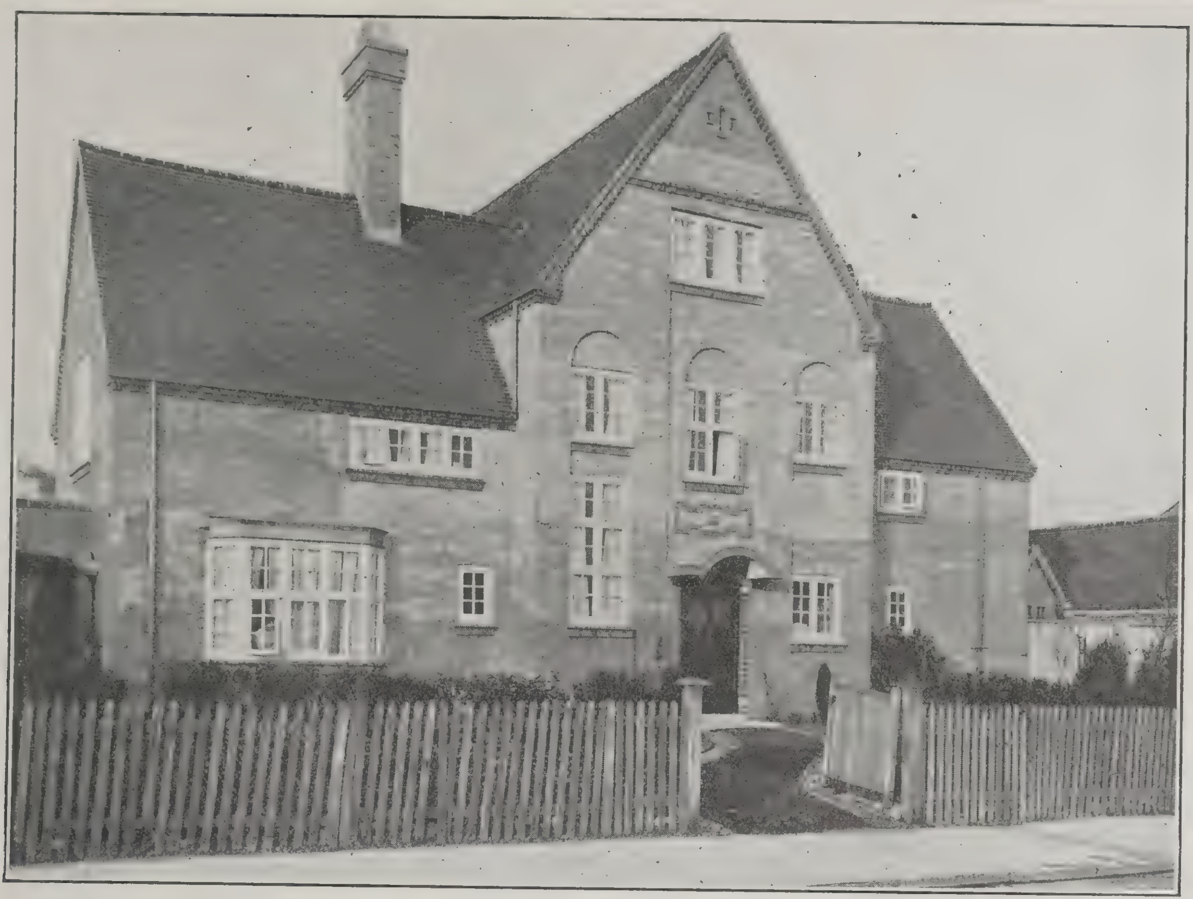
The school is intimately connected with the School of Architecture, of which it forms a department, and the students of both schools will pursue their studies together, and the teaching of draughtsmanship in its higher branches will form a very important part of the work. Mr. W. H. Lever, M.P., who has endowed the chair, has also given three prizes, of £20, £10, and £5 respectively, to be competed for annually by students of the two schools, for a scheme for laying out the remaining unoccupied land at Port Sunlight, and he further offers to pay £100 for the right to execute any of the schemes submitted for these prizes.

There are two courses of study—the Certificate and the Diploma. The former includes the development of the city and the influences affecting its growth, civic engineer-



HOUSE AT EDGBASTON, BIRMINGHAM. H. T. BUCKLAND AND E. HAYWOOD-FARMER, ARCHITECTS.

1.—Dining-room. 2.—Drawing-room. 3.—Motor. 4.—Garden Door, 5.—Hall. 6.—Porch. 7.—Entrance. 8.—Cloaks. 9.—Scullery. 10.—Kitchen. 11.—Larder. 12.—Yard. 13.—Coal. 14.—Bedroom. 15.—Upper Hall. 17.—Bathroom.



HOUSE AT EDGBASTON, BIRMINGHAM. T. H. BUCKLAND AND E, HAYWOOD-FARMER, ARCHITECTS.

This house is built of common local bricks, finished in cement rough-cast; the roof is covered with red sand-faced tiles. The chimneys are faced with thin Black Country bricks of varying tints, pointed in white mortar. The joinery of red deal is painted white.

ing and hygiene, law as related to town planning, civic architecture, civic decoration, landscape design, and studio work. The Diploma course includes the preparation of at least two town-planning schemes for definite areas, and plans, supplemented by written matter, presenting general provisions; studies of the details of one of the above schemes; a study for the reconstruction of an existing area; design for an incident in town planning to special conditions. The staff is as follows:—Professor of Architecture, C. H. Reilly, M.A., A.R.I.B.A.; Associate Professor of Civic Design, S. D. Adshead, F.R.I.B.A.; Civic Design Lecturer and Research Fellow, P. Abercrombie; Landscape Design Lecturer, T. H. Mawson, Hon. A.R.I.B.A.; Civic Engineering, Associate Professor, J. A. Brodie, M.Inst.C.E., etc.; Professor, S. W. Perrott, M.A.I., etc.; Civic Hygiene, Professor, E. W. Hope, M.D.; Civic Law Lecturer, H. Chalmer Dowdell, M.A., B.C.L.

A paper on "The Growth of Cast Irons after Repeated Heatings" was contributed to the autumn meeting of the Iron and Steel Institute by Professor H. F. Rugan (Tulane University of Louisiana) and Professor H. C. H. Carpenter (Victoria University, Manchester). The main cause of "growth," they said, was the disintegration of the material caused by the oxidation of the iron silicide. In close-grained irons the pressure of gases also contributed to the growth. At the close of the process the oven lost the properties of cast iron, and could be sawn like a piece of chalk. The authors recommended that white irons should be tried for annealing ovens instead of grey. Mr. J. E. Stead (Middlesbrough) said that the oxidation of grey iron followed along the sides of the graphite plates, which with each heating became more open from the metal and allowed of the entrance of oxygen. Professor Thomas Turner (Birmingham University) said that in the case of white iron, so long as it remained white there was no expansion, which, however, took place as soon as the iron deposited its carbon. The expansion was something like the process that took place in lead on a roof, which only expanded downwards under the heat of the sun, until it gradually "walked off" and fell to the ground. The iron in a soft state was surrounded by a hard case, and when it wanted to shrink back to its original state it could not do so.

* * *

Sir W. Richmond, speaking at Sheffield at the annual convention of the National Association of House Painters and Decorators, said there was an enormous population in which good taste was practically nonexistent. He referred to the great mass comprising the lower and upper strata of the middle classes. The agricultural peasant may be a boor; the town-bred middle-class man is a Philistine. The former may have chances of development; the latter is self-sufficient, self-occupied, inelastic, respectable, and dull. Discussing the decoration of a house, Sir William said a wall paper was an undesirable companion for many reasons. Good or bad it was difficult to cleanse. Germs were harboured in the old paste or decaying paper. There was a disinclination to remove it when rooms were being repapered. There were excellent distempers which fixed powder colours, and were washable and permanent. He advocated the use of these instead of wall paper. He advised the selection of the lightest tones. Under present conditions of the atmosphere in cities light rooms were essential on every account. It was true dirt was more visible on light than on dull effects. But surely it was better to see the dirt than not. It was a sign that cleaning was necessary. On the whole, the most effective, healthiest, pleasantest room to live in was a white room. There was no white so pure as lime; no product was so successful in the slaughter of offensive animal matter. Every coloured object, save dark ones in large masses, looked well on white, which in his opinion was the safest of all tints to use in large quantities. White walls almost doubled the appearance of the air they environed. He recommended the avoidance of oil or varnished white leads on walls. Washable distemper supplied a want and deserved attention. It was undesirable to varnish woodwork. It had better receive a subdued polish. As to furniture, the simpler the better, always of unpolished wood.

* * *

Berkhampstead House, Herts, an Elizabethan building, partly of flint, with fine old gardens, the whole extending to about 12½ acres, was recently put up for sale, but was bought in at £11,500. It stands 470ft. above sea level, overlooking the ruins of Berkhampstead Castle and the common. In 1650 a Parliamentary survey of the demesnes of the Honor of Berkhampstead was made by Parliamentary Commissioners preparatory to the sale of Crown lands. A quaint description of the property, as it then appeared, is preserved in the Public Record Office. It may be summarized as follows:—"That capitall mess'mansion scituate on a hill, and built with flint and Taternell stone cheqr. fashion, w'ch doth much adorn and set fourth same, and covered with slatt; great parlor wainscotted from the floore upp to the seelinge, very badd floored, but well lighted and seeled, kitchen paved with flour, well fitted and joynted. Above stayres one room called the dyneing room." Whether the house, of which other details are also given, was included in the valuation is not clear, or whether it was an attempt to value the site apart from the buildings, at any rate the document ends thus:—"The ground whereon the said houses stand together with the courts, yards and gardens is comprehended in the admeasuremt of the parke, and is worth per annum xxx-*l*." During the term of a lease granted in 1660 to Jerome Weston, Earl of Portland, the greater part of the house was burned down.

INSTITUTE OF BUILDERS ANNUAL DINNER.

The President on the Work of the Institute.

The annual dinner of the Institute of Builders took place at the De Keyser's Royal Hotel, Victoria Embankment, E.C., on Tuesday, October 12th. There was a good attendance, and the President of the Institute, Mr. W. F. Wallis, J.P., occupied the chair. Others present:—Messrs. Ian MacAlister, Secretary R.I.B.A.; J. W. White, J.P.; S. Smethurst, J.P.; F. G. Rice, President, London M.B.A.; Ernest J. Brown, President, National Federation of Building Trade Employers; E. E. Humphreys; F. G. Wallis; H. E. Matthews, F.R.I.B.A.; F. W. Ruck; G. E. Bond, J.P., President, Society of Architects; T. J. Bailey, F.R.I.B.A., Architect, L.C.C. Education Department; C. W. Ferrier; F. L. Dove, L.C.C., Past President, I.O.B.; Henry Tanner, jun., F.R.I.B.A., President, Architects' Association; Alex. R. Stenning, F.R.I.B.A., President, Surveyors' Institution; Edwin T. Hall, F.R.I.B.A., Vice-President, R.I.B.A.; James S. Gibson, F.R.I.B.A., Vice-President, R.I.B.A.; H. T. A .Chidgey, President, Quantity Surveyors' Association; Wm. Shepherd, Past President, I.O.B.; Leonard Horner, Vice-President, L.M.B.A.; G. Marfarlane, Sidney Leaning, F.S.I.; C. H. Barnsley, Past President, I.O.B.; Fred. Higgs, Vice-President, I.O.B.; R. W. Neill, J.P., Vice-President, I.O.B.

The loyal toasts having been honoured,

Mr. F. G. Rice, President of the London Master Builders' Association, gave the toast of "The Architects and Surveyors." Mr. Rice said that in calling upon him to perform the duty of proposing this toast, the Institute had paid a compliment to the London Master Builders' Association, which he could assure those present was highly appreciated. Architecture he said was one of the most agreeable and fascinating professions a man could enter. The closer attention architects were now giving to town planning was a matter for satisfaction, although he was afraid it came too late for London. One of the things for which he envied the citizens of Paris was the beautiful grouping of the squares in their city; and, if architects had only given the same attention to the grouping of buildings and the formations of squares in London, our great city would have been the envy of the world in every respect. He expressed his deep gratitude, especially to the Royal Institute of British Architects, for the way in which they dealt with a Bill which came before Parliament, a piece of grandmotherly legislation the object of which, its promoters declared, was to facilitate and safeguard building, but which, had it not been for the prompt action of the architects and others interested, would have resulted in greatly retarding British building. With the toast he coupled the names of Mr. Tanner, jun., and Mr. Stenning.

Mr. Henry Tanner, junr., F.R.I.B.A., President of the Architectural Association, said that it was not until recently he became aware of the difference between the Institute of Builders and the Master Builders' Association. The former, he understood, was the only incorporated body of builders in this country which had been in existence a considerable number of years. All he could say was that between these two bodies surely the building trade must be well organised.

Mr. Alex. B. Stenning, F.R.I.B.A., F.S.I. (President of the Surveyors' Institution), who replied on behalf of the Surveyors, said he was an old practising architect and surveyor, and in his young days there was not the division between the two occupations which exists at the present time. In regard to the Bill introduced by the L.C.C. on the question of reinforced concrete construction, Mr. Stenning expressed his satisfaction at the result of the combined action of the Institution of Civil Engineers, the Surveyors' Institution, and the Royal Institute of British Architects, which, he said, had the effect of bringing the L.C.C. to a proper state of mind, and after a great deal of time and money had been wasted, amendments were inserted in the Bill which prevented the measure, which would not do much good, at least, from doing any harm so far as London was concerned.

Mr. G. E. Bond, J.P., President of the Society of Architects, next proposed the toast of the evening: "The Institute of Builders and its President." Every member, he said, of the Society to which he belonged, depended upon the hearty, honest, and intelligent co-operation of the builder for the success of his designs and his efforts to provide clients with the buildings they desired, constructionally sound, and at a reasonable cost.

The President in replying, thanked them for their cordiality. The Institute had for its field the whole interests of the building trade, with one exception, and that was the employers' relations with workmen. In regard to this, Mr. Bond had been slightly mistaken in his allusion to the work of the Institute. It was the only Society which was incorporated and which could intervene in any Government measure affecting the building trade, and give evidence before committees of enquiry, etc. Its work could be divided into four divisions, that was to say, work in connection with Parliamentary matters, work in connection with architects, etc., work in connection with municipal acts, and educational work. He had been looking over the agenda paper of the Institute during the last ten years, and he was startled at its manifold activities. The Institute worked in an unostentatious manner, without advertising itself in any way, and among the various things they had had before them were plumbers' registration, extraordinary traffic, workmen's compensation, Employers' Liability Act, Water Board charges, prevention of corruption in building, and labour exchanges. Of late years Parliament had been exceptionally busy on the side of workmen, and it had therefore been the great endeavour of the Institute to put before the Government the employers' interests, and he was bound to say that they had always found the State officials most willing to learn their views on any matter affecting the trade, and those views had been put forward with marked success. They had several gentlemen of great ability upon the Council, for instance, there were Mr. Shepherd and Mr. Frank May; the latter, he was sorry to say, was not present that evening; there were also Messrs. Greenwood and Holloway, gentlemen of the greatest experience and wide views, and whose opinions were received by the State officials with the respect they deserved. With regard to their Parliamentary work, the builders of the country owed the Institute a great debt of gratitude for the trouble it had taken and the expense it incurred in opposing the Bill which had already been mentioned, and in connection with municipal matters they had had a large amount of correspondence, etc., with various municipalities, including also the L.C.C., in reference to the question of scaffolding regulations. They had also appointed witnesses to give evidence before various royal commissions dealing with factories and other matters, which had they not intervened might easily have been led to formulate rules which would have been disastrous to the building industry The *magnum opus* of the Institute had been achieved in the completion of the long debated form of contract which was now working with unqualified success. It was true they had been a little alarmed at the obtuseness of one of H.M. judges being unable to read the English language, and they had been asked to amend clause 30, but he was glad to say that a form had been agreed upon between the Institute and the architects and themselves, which would solve the difficulty. There were many industrial matters which had also been satisfactorily dealt with, and they had also made some steps in the direction of maintaining friendly relations with foreign contractors. Quite a number of Belgian contractors came over to England, and great cordiality was manifested. If such excellent relations continued they would be able in the future to feel that when they were abroad they could call upon the foreign contractor and look upon him as a brother. (Laughter, and cries of "hear, hear.") Referring to the educational side of the Institute's work, Mr. Wallis said its progress was not quite so great as could be wished, but in this direction their efforts were somewhat limited. In conclusion, he urged upon all those present to use their best endeavours to increase the membership of the Institute, and expressed his appreciation of the great assistance rendered by the secretary, Mr. Costigan, who, he said, had the interests of the Institute entirely at heart.

Mr. James S. Gibson, F.R.I.B.A., proposed the toast of "The National Federation of Building Trade Employers of Great Britain and Ireland," and, in doing so, he urged upon builders and surveyors to make the best of conditions of work as they found them. The energies of the National Federation should be concentrated on those qualities which would tend towards good building, good workmen, and success in the art of architecture, as well as the art of building. A great deal could and ought to be done in the matter of the education of the workmen, because it was only by providing good workmen that they could hope to get good work. There were spheres which were open to them all as builders, and men of influence in municipal life and in social and political life, and he was certain that as opportunities arose they would do their best to help architects to regain, if not the full height of their former standing and prestige, at least some position of influence by which these qualities might be of some assistance and value in these modern times. For instance, he would mention the question of the regulation of the traffic in the city of London. Not one architect was invited to sit upon the commission appointed to consider that question, and none of the evidence had been placed before his Institute upon the matter. The commission had not even asked the opinion of the R.I.B.A. upon one of the largest, finest, and grandest architectural opportunities which could arise in the history of this country. (Hear, hear.) He wanted the builders to impress upon members of Parliament with whom they were acquainted, the advisability when projects such as the one he had mentioned came up for discussion, that the opinion of the architect should be asked, and a seat found for him at the table, so that he could make the necessary notes and perhaps ask some of the more important questions. The toast, coupled with the name of Mr. Ernest J. Brown, President of the National Federation, was warmly accorded.

Mr. Brown, in reply, said that in the past the builders of London were apt to look with a cold eye upon the National Federation, but their hearts were now warming to it and they were ready to assist the Association in its objects. The Federation was growing not only in numbers, but in its financial power, which was a great necessity in an Association of employers such as those connected with the building trade. He was sorry to say that there were still many most important builders in the country who still stood aloof from such organisations as theirs, and he only hoped that one day they would see the error of their ways. It was a matter of regret and shame to see such builders reap all the benefit sustained through a federation, yet doing nothing for either their efforts or their purses, to assist in its work. Their work was as important, he ventured to say, as the work of the London master builders and architects combined, for they were engaged in looking after the interests of builders throughout the whole of the country. Their work was growing in importance and so much so, that they were beginning to be recognised as a power in the land.

On the proposition of Mr. Fredk. Higgs, the toast of "The Visitors" was honoured with enthusiasm, and Mr. H. J. Treadwell, F.S.I., replied.

The proceedings terminated with the singing of the National Anthem.

NON-PROVISION OF QUANTITIES: IMPORTANT MOVEMENT.

A conference, convened by the President of the Quantity Surveyors' Association, to consider the question of the non-provision of quantities by building owners when inviting tenders from contractors, was held at the Holborn Restaurant on October 13th, at which the following were present: Messrs. W. F. Wallis, W. Shepherd, E. J. Strange and J. Randall, representing the Institute of Builders; Messrs. E. J. Brown (London), S. Smethurst, J.P. (Oldham), J. Wright (Nottingham), J. W. White (Sunderland), W. Thomas (Cardiff), F. Higgs (London), and A. G. White (secretary), representing the National Federation of Building Trades Employers; Messrs. F. G. Rice, F. May, J.P., B. I. Greenwood and G. Bird Godson, representing the London Master Builders' Association; Messrs. H. T. A. Chidgey (president), Walter Lawrance, F.S.I., A. J. Gate, F.S.I., S. Chatfeild Clarke, F.S.I., T. E. Bare, T. J. Carless, H. Raven, H. Riley, S. A. Stanger, F.S.I., S. G. Thacker, E. Ware (Liverpool), and A. G. Cross, F.S.I. (honorary secretary), representing the Quantity Surveyors' Association.

A very interesting and exhaustive discussion ensued, in the course of which the methods adopted by the Northern branches of the National Federation for dealing with this grievance were fully explained, and met with much approbation.

Messrs. Brown, Wallis, Rice, Smethurst, White, Wright, Shepherd, May, Randall, Lawrance, Chatfeild Clarke, Higgs, Godson, Greenwood, Gate, Carless, and others, took part in the debate, which lasted for upwards of two hours, and the following resolutions were unanimously passed:—

(1) "That the conference disapproves of the practice of asking for tenders in competition for works of a substantial value without quantities prepared by a fully qualified quantity surveyor being supplied, and is of opinion that such quantities should be supplied in all cases when competitive estimates are invited for works expected to cost £500 and upwards.

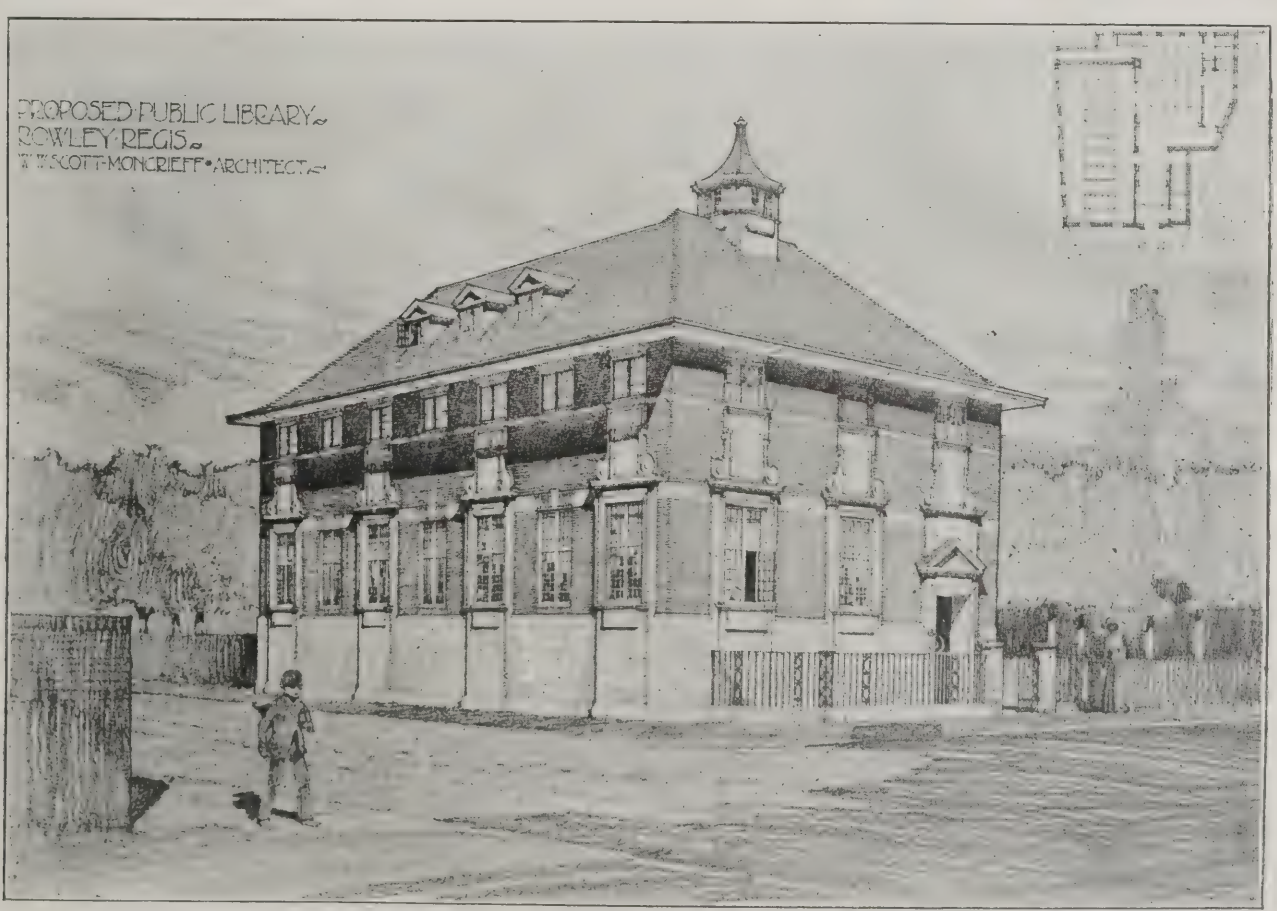
(2) "That the conference recommends the Councils of the Institute of Builders, the London Master Builders' Association and of the National Federation of Building Trades Employers to urge their members to refuse to tender in competition without quantities for works costing £500 and upwards.

The subject is dealt with in our leading columns.

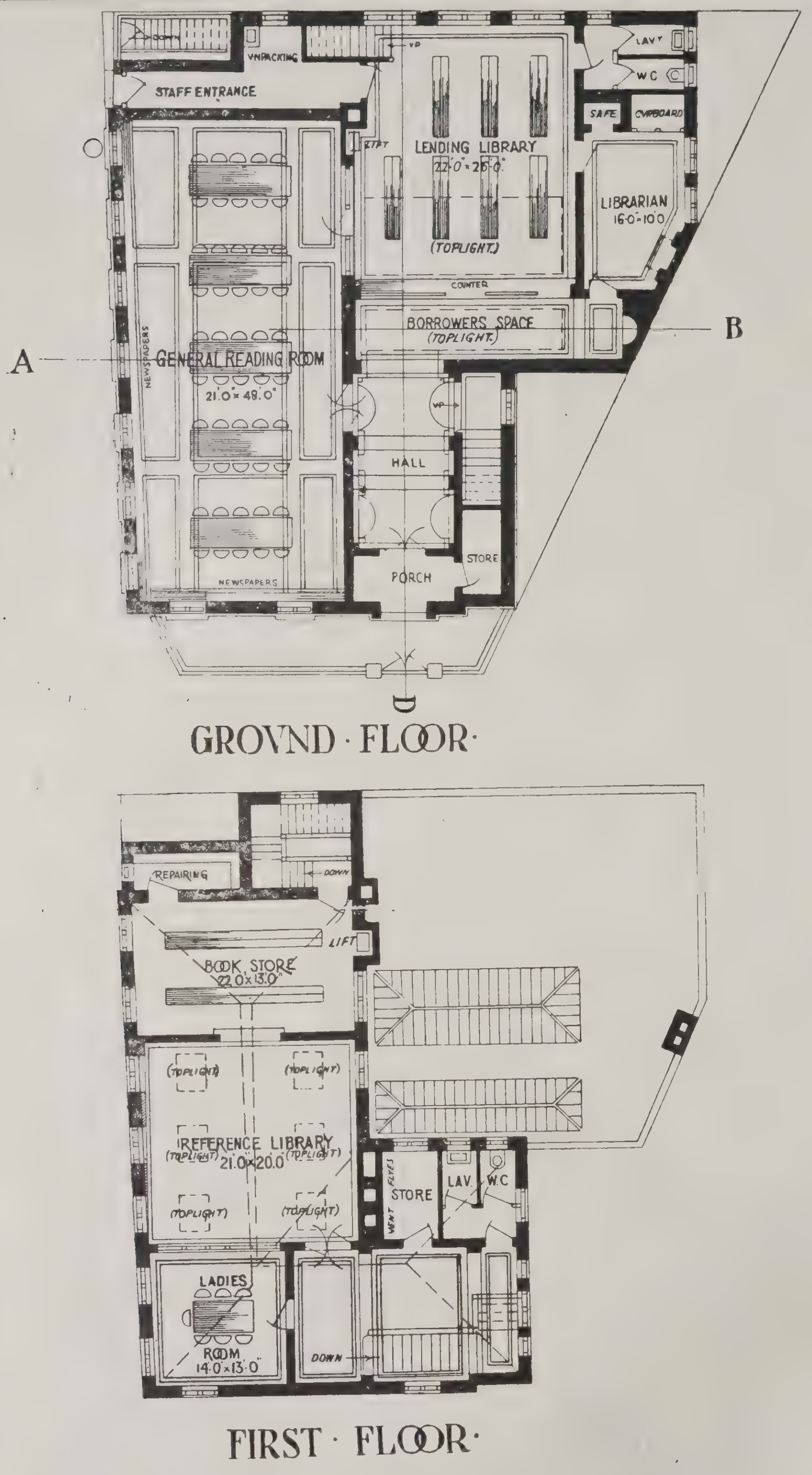
Law Case.

Important Dry-Rot Question.

In the High Court of Justice, before Mr. Justice Grantham and a special jury, Mr. Claude Frederick Shoolbred, a chartered accountant, brought an action against Mr. J. W. Wyles and Mr. A. Migotti, architects, and Messrs. Mitchell Brothers, builders, of Guildford, to recover damages for alleged negligence and breach of duty in carrying out alterations at the plaintiff's house, Greenstead Hall, Essex. Mr. J. R. Atkin, K.C., and Mr. Valentine Ball appeared for the plaintiff; Mr. Marshall Hall, K.C., and Mr. R. E. Moore for the defendants. Mr. Atkin said that in 1906 the plaintiff appointed Messrs. Wyles and Migotti architects of the work to be carried out by the defendants Mitchell Brothers at Greenstead Hall. The plaintiff wished steps to be taken to deaden sound between a sitting-room on the ground floor and a nursery overhead. Lime-pugging was used for the purpose. In May, 1908, after the plaintiff had been residing in the house for nearly a year, it was discovered that the whole floor under the nursery was affected with dry-rot. The floor had to be removed and replaced at a cost of £120, and plaintiff also lost the use of the house while it was being done. He would call evidence to show that the dry-rot was due to the lime-pugging being put in wet, and being given insufficient time to dry before the floor boards were laid. The fact that the floor boards were grooved and tongued, and that there was no ventilation underneath, made it all-important to see that the pugging was properly laid.—The defence by the architects was that they were not consulted about the pugging at all, and did not know of its existence until the dry-rot was discovered. It was also contended on their part that dry-rot was solely due to the fact that linoleum had been put down immediately after the floors were laid.—The builders, on the other hand, said that the plaintiff himself ordered their foreman to use pugging; that the floor was not laid until three months after, when the pugging was dry. The jury, upon the evidence, would have to say whether there had been negligence. Evidence was called that the pugging was put in early in 1907, and the floor was laid three weeks later. The plaintiff also stated that he did not give the order for pugging.—Mr. Chatfeild Clarke, F.R.I.B.A., and Mr. Saunders, A.R.I.B.A., stated that the dry-rot was due to improper ventilation. Ventilation was especially necessary where a floor was tongued and grooved.—For the defence, Mr. Wyles said that he had had 15 years' experience. He never knew of the pugging till he heard of the dry-rot. He did not approve of it, and, if put in, the place should have been ventilated. The trouble, however, was due to the linoleum.—Mr. Ogden, F.R.I.B.A., said that while moisture induced dry-rot, the spores of the fungus were in every piece of cut timber. In his view the dry-rot was caused by the linoleum.—Mr. Migotti said that he did



This design was submitted for the competition held last year. It is planned with two floors in order to give a more dignified building than one with a single storey. The reading room and staircase are placed near the entrance so that the borrowers' space beyond might be free from disturbance. The Librarian's room is in communication with both the public and lending library. The book lift is near the back entrance, and serves to connect reference room and store above with the lending library. On the first floor is the ladies' room and lavatory, also the reference room, book store and repairing room. Extreme simplicity of treatment gives the character of the elevations, which were to have been of thin red bricks and Portland stone, with a tile roof. The windows would have had iron casements and leaded lights.



DESIGN FOR A PUBLIC LIBRARY, ROWLEY REGIS. W. W. SCOTT-MONCRIEFF, ARCHITECT.

not think the dry-rot was due to any negligence on the part of Messrs. Mitchell Brothers, but was caused by putting down the linoleum and stopping the current of air through.—The foreman of the work said that the flooring was put in three months after the pugging was put in. He had not considered the question of ventilation. The architects did not authorise the putting in of the pugging, and he did not mention it to them.—His Lordship, in reviewing the evidence, after Mr. Atkins had briefly replied, said that it was three years since the matters connected with the dispute arose; plaintiff and defendants could not well remember in detail everything that then occurred. After such a lapse of time it was only natural mistakes would be made. It was remarkable that scarcely two witnesses on the defendant's side had agreed. The question was whether or not negligence had been proved against either of the defendants or both of them. His Lordship next pointed out that some of the defendants' witnesses said ventilation was necessary, while others said it was not; when expert witnesses talked in that way, then the jury must use their common sense. Everyone knew that one of the causes of dry-rot was dampness without ventilation. Was not that the case in the present instance?—The jury returned a verdict for the plaintiff, saying the architects were only guilty of negligence in a minor degree. £165 damages were awarded, and his Lordship gave judgment for that amount, refusing stay of execution.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Oct. 30.	TECHNICAL AND SECONDARY SCHOOL, WORKINGTON. The Cumberland Education Committee invite architects to submit sketch plans with outline specification and estimate for a technical and secondary school in the Borough of Workington, Cumberland, for about 300 pupils of both sexes. Further particulars and conditions upon which plans will be received may be obtained from the undersigned on receipt of a stamped and addressed foolscap envelope and the payment of a deposit of one guinea. Deposit returned if all papers sent are returned within seven days. C. Courtenay Hodgson, Secretary, The Courts, Carlisle.
Oct. 31.	PEMBROKESHIRE SMALL HOLDINGS: Model plan and specification for a farmhouse and outbuildings suitable for a holding of 50 acres, and at a cost of £400 or thereabouts. The following are some of the conditions: (1) The selection of the plan and specification to be adopted shall rest solely with the Council. (2) The Council will be prepared to pay a sum of £5 5s. for the selected plan and specification, which are then to become the absolute property of the Council. (3) If the Council are of opinion that none of the plans are suitable for their purpose they shall not be obliged to make any selection. Plans and specifications to Marshall George, Clerk and Agent, Pembrokeshire Small Holdings and Allotments Committee, Haverfordwest.
Nov. 1.	PRESTON GRAMMAR SCHOOL FOR BOYS. Preston Town Council invite competitive designs and plans from architects practising as principals, for a new grammar school for boys, to be erected in Moor Park Avenue, Preston, and estimates for the same. Premiums of £50, £30. and £20 are offered. The Corporation have appointed a professional assessor. Application to be made to Mr. Alfred Howarth, Town Clerk, Town Hall, Preston, and designs and plans must be sent in by 10 a.m. on Nov. 1.
Nov. 30.	HERNE BAY PAVILION ON PIER. Herne Bay Urban District Council invite competitive drawings for a pavilion to be erected on the proposed extension of the pier at a total cost not exceeding £4,000, exclusive of architect's commission. Premiums of twenty-five guineas and ten guineas. Plan of the site and copy of the conditions may be obtained from J. Jubb, Clerk to the Council, Town Hall, Herne Bay. Deposit: one guinea.
Dec. 18.	TRAINING COLLEGE FOR TEACHERS, Kirkstall Grange, Far Headingly, Leeds. Architects practising in Leeds are invited to submit competitive designs for the above College. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed Assessor. Copies of the conditions of competition and instructions, a plan of each floor of the educational blocks and of the hostel blocks, also an estate plan, showing a suggestion for grouping the various buildings may be obtained from James Graham, Secretary for Education, Education Department, Leeds. Designs to be delivered not later than 12 o'clock noon. Deposit: £2 2s.
Jan. 31, 1910.	NATIONAL MUSEUM OF WALES. The Council desires to receive competitive designs for the erection of a new National Museum at Cardiff, Three premiums are offered of £200, £150, and £100, for second, third, and fourth. The Council have appointed Sir Aston Webb, R.A., Mr. John J. Burnet A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A., as Assessors. Particulars and plans of the site will be supplied to competitors on payment of a fee of £2 2s., returnable if all papers are returned within 14 days. Inquiries to be addressed to Dr. Wm. Evans, Hoyle, Director of the Museums, City Hall, Cardiff.

A writ has been served on Cardiff City Council with respect to a claim by Mr. Edward Seward for architectural services. The circumstances of the claim are already familiar to our readers, and, pending the settlement of the action, we refrain from further comment.

BUILDING TRADE ORGANISATION IN FRANCE.*

By A. G. White.

On the occasion of my visit to Paris in November, 1908, to attend the International Congress of Building Contractors, I obtained from the General Secretary of the master masons of Paris a number of publications bearing upon the above question. These I have perused, and I propose to shortly review the information they contain so as to convey to you some idea of how the French builders are organised and what sort of questions and conditions they have to face.

In France both builders and public works contractors have deemed their interests sufficiently identical to warrant their forming part of a common organisation known as the French Federation of Building and Public Works Contractors.

According to its President, this Federation consists of:—

28 Syndicates (or local Associations), with a total of 5,400 members forming the Central Federation.

35 Syndicates (or local Associations), with a total of 4,000 members forming the N.-West Federation.

38 Syndicates (or local Associations), with a total of 3,500 members forming the N.-East Federation.

44 Syndicates (or local Associations), with a total of 2,500 members forming the S.-West Federation.

30 Syndicates (or local Associations), with a total of 3,500 members forming the S.-East Federation.

16 Syndicates (or local Associations), with a total of 1,250 members forming the Northern Federation. Total Syndicates, 208; total membership, 20,150.

The value of the work done by the members of this body yearly is estimated at about 2 milliards of francs. The rules of these regional federations accord with one another and taken together they constitute the National Federation.

At their first Congress in Bordeaux, in 1907, there assembled about 800 delegates, representing 108 syndicates.

New Federations may not be admitted to the National Federation unless they have a membership of at least 1,000, and they must pay an entrance fee of 250 francs.

The subscription to the National Federation is 50 centimes per member per year with a minimum of 500 francs for any Federation. On a membership of 20,150, this gives the French National Federation a revenue of £420 a year nearly.

The subscription of a centre in England, paying the maximum subscription works out at about 2s. per member on existing membership, but on a membership as proportionately large as that of the French Federation, this rate would be considerably reduced, possibly to 1s. or even 6d. per member.

The Executive Council of the French Federation numbers 42 members, 7 from each regional federation, large or small. The Executive Council meets once a year, it is elected for 3 years and 1-3rd of its members retire yearly.

Its Administrative Committee (termed in France, the Bureau), consists of 15 members, each regional federation being represented by a V.P. and a secretary, and the rest by the officers of the National Federation.

The Bureau meets twice a year unless called specially. At other times the President has full powers to represent the Bureau.

It will be observed that the system of representation is scarcely so democratic as that in force in the English Federation and the meetings do not take place so often as with us.

The National Federation in France is a comparatively new organisation, as are most of their other organisations.

The regional federations are composed of subsidiary local associations termed syndicates, and of groups of such syndicates.

The following remarks refer to the Paris and Seine district.

Each branch trade has its own local association or syndicate, of which the Master Masons' Association of Paris may be taken as a type.

Bricklayers also come under the term masons in France.

This association is a syndicate formed for a period of 25 years from January, 1908, but the original association appears to date from 1810, in addition to the usual objects of association with which we are familiar, I note the following, which are somewhat exceptional.

5. To study and to propose all possible improvements in the art of building.

7. To give advice in affairs which may be remitted to the association by the tribunals and to settle as a friendly composer of differences and in conformity with the law, any contestations relative to the industry it represents which may be remitted to it by members or even by third parties.

8. To create libraries, professional courses of instruction for workmen or employees, employment bureaux, etc.

9. To establish schedules of prices with sub-details as to materials and labour.

10. To see that each member of the syndicate observes vis-a-vis with his colleagues all the rules of a courteous and loyal competition.

11. To repress by its influence all failures to observe the said objects.

The syndicate has power to acquire accommodation for its meetings, libraries and professional courses, also to create among its members special benefit funds for mutual help and for retirement pensions. Members must be duly recognised contractors in full enjoyment of all civil rights and be introduced by two members. Newly elected members are expected to attend the next meeting after election in order to be presented to their colleagues.

The rate of subscription is not given in the rules, it is determined by the Council each year.

The organisation consists of a general assembly, and an Executive Council of 42 members elected for three years, 1-3rd retiring annually.

No member of Council may serve more than two successive terms without one years' interval, and a Bureau or Administrative Committee of seven members, all officers, reelected each year, members of Bureau may serve three terms, then one years' interval must elapse.

Meetings are held monthly, the Bureau meets one hour before Executive Council.

The President is the legal representative of the syndicate.

A Budget is prepared annually, the Budget proposals once adopted must not be exceeded. Supplementary credits must first be voted.

Attendance at meetings is required. Councillors missing four successive meetings without having excused themselves may be deemed to have resigned, and the matter shall be considered at the fifth meeting.

Councillors are subject to a fine of three francs for each non-attendance at Council or Bureau.

The only cases for exemption are: Jury call, military service, illness, public service or leave duly obtained.

A committee of discipline is elected annually by the E.C.; it consists of the President and two members of Council.

It has to consider all infractions of the rules or resolutions of general meeting, penalties inflictable are: Reprimand, fine, temporary suspension, permanent suspension. Fines may not be restored.

The capital of the syndicate consist of: Excess of receipts over expenditure; gifts or legacies.

At dissolution of syndicate, funds are equally divisible among their membership.

The Council at its discretion may give annually medals to deserving workmen or pupils.

Grouped Associations.

At Paris the various associations appertaining to the different trades are grouped together for certain purposes of common action.

Term of group, 17 years.

They have a common headquarters consisting of meeting rooms and offices.

Each society pay 100 francs subscription yearly. Ten per cent. of this is placed to reserve, the balance applied to revenue. Should the expenses exceed this revenue the societies contribute the shortage proportionately.

Each society forming part of the group must be a properly constituted syndicate. Each syndicate retains entire autonomy and conserves its own archives.

Membership of the group entitles each syndicate to use the headquarters accommodation for meetings of every kind. All necessary clerical and accounting work is provided for them, all minutes are kept for them and copies furnished if required. All archives, books or other things constituting the library of each syndicate is classified and taken charge of for them; in fact, everything done for the good conduct of the business of each syndicate.

Special work other than that covered by the usual routine when required by any syndicate has to be separately paid for, such as work connected with professional courses, fetes, balls, banquets, etc. The reserve fund is used to construct or provide a habitation for the groups, works useful to industry, allocations to such works. The administration is in the hands of a Council composed of the Presidents of the respective syndicates, with one delegate for each syndicate having a membership of less than 100 members and those of over 100 members are entitled to two delegates.

It meets four times a year.

Resolutions affecting the general interest must secure a 2-3rd majority to become effective.

The Council manages the general business relating to funds, headquarters, salaries, etc.

The Bureau consists of a president, three vice-presidents, a treasurer, and three secretaries.

The Bureau manages business as to:—

Centralising information on questions of general interest.

Obtaining advice from syndicates on specific points for the use of the permanent commission for studying questions.

Submitting new questions to the respective syndicates.

Organising action in common, such as petitions, re-unions, delegations, etc.

Studying all litigious or contentious questions affecting the association or referred by its members.

Executing all decisions of the Council and acting as an Emergency Committee.

Determining the recompenses to be awarded to workmen and pupils.

Generally doing everything to facilitate the functions of the professional courses.

The Bureau meets monthly or oftener if required.

The President represents the group in its corporate capacity.

Commissions of Study.

The delegates of the Syndicated Chambers are divided into three sections, called as above, presided over successively by each of the vice-presidents.

Their mission is to study questions of interest to the associated industries either when remitted to them by the Bureau or on their own initiative.

They draw up reports to the Bureau on the questions considered.

Publications.

A periodical publication is made of all reports, resolutions, minutes, and notices emanating from the Council or from the syndicates.

Similarly all communications of general interest, extracts of legal decisions, matters of jurisprudence or of technical controversy are published.

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*A Paper read before the Conference of Secretaries of the National Federation at Leeds yesterday.

Also any information and any publicity likely to benefit the group or its members.

Each syndicate has a right to a publication of extracts of its own proceedings, and is allottted six pages a year; extra pages may be had, however, by payment.

To provide for the cost of this publication, each syndicate has to pay an annual sum ascertained at each year end for each of its members.

In addition, there are the extra sums due for extra insertions.

Any further sum is paid by the general fund of the group.

Recompenses for Workmen and Others.

A medal of silver with diploma is awarded annually as a prize to recompense the probity, intelligence and devotion of foremen, or workmen having at least 10 years consecutive service with the same employer.

Four chambers in rota present a candidate each year.

Medals in silver and bronze are also awarded to distinguished pupils in the professional courses.

Individual syndicates may also award medals if they choose.

The grouped associations of Paris and the centre of France form a regional Federation under the title of the Central Federation of Syndicated Chambers of the Building Industry and of Public Works.

The rules offer no features specially different from those already commented on.

Among the objects of the Federation is given the following: "To group all the desiderata and draw up a common programme of economic demands which shall become the common policy of all the Syndicated Chambers in the Federation, and thus give to the directing committee more authority and weight in the defence of the corporate interests and in the execution of the decisions of the Federation."

The annual contribution per member from each syndicate is fixed at one franc, modifiable by general meeting yearly. Committee have power to vary it, however, in exceptional cases.

With its membership of 5,400, this gives a revenue of only £225 a year.

The following will give some idea of the work done by the foregoing organisations.

On the 20th December, 1908, at Paris, the 25th distribution of recompenses to workmen and employees took place, presided over by a Government representative, when 153 prizes or medals of honour were presented in the various grades, a banquet followed.

M. Soulé, in the course of his address, mentioned that the following works of a social character had been initiated and carried on by their organisation.

1. The creation of recompenses to meritorious workmen.

2. Mutual Insurance Societies created prior to the law of 1898 as to workmen's compensation, for the aid of injured workmen and their dependants

After the law of 1898, these were transformed into the General Guarantee Syndicate for Building and Public Works, and the General Association for Industry and Building Insurance.

3. Twelve courses of instruction in the building profession, absolutely free for workmen or employees of the syndicates of carpentry, joinery, roof covering, plumbing, masonry, locksmithing, carriage work and carpet work. These courses are subventioned by the State. They are followed each year by more than 150 pupils.

4. An employment office, quite free of charge, which during the year has found work for 936 employees and workmen.

5. Arbitration Commissions which have had remitted to them by the Tribunal of Commerce during 1908, 887 cases of which 143 are still under consideration and of the remaining 740 cases, 450 have been settled by conciliation, equal to 60 per cent.

6. A Judiciary Council of the Federation (central), consisting of a re-union of jurisconsults, experienced in business cases, especially as regards the building industry. This Council is at the disposal of members and local Chambers for the legal consideration of questions affecting the industry.

7. The service for contentious cases, which defends the interests of our adherents in their personal cases on the most economical lines as regards legal expenses.

8. The library of the syndicate, containing 4,000 volumes and added to each year with special works relating to building.

9. Two publications, one weekly the other monthly.

These inform the membership of the whole Federation as to all reports on questions under consideration.

The above 9 heads relate more especially to the region of Paris and the departments of Seine et Oise forming the Central Federation.

Apprentices' Competition.

As a further example of what is being done, the following is taken from an announcement in the Official Journal re above. Competition by the joiners' or cabinet-makers' section, organised by the Syndicate Chamber for 1909.

1. Reserved for young people under 15 years of age.

2. For young joiners not yet through their military service.

The first consists of an eliminatory test consisting in the execution of two different pieces of joiners' work set by the committee to be sent in before 15th February, 1909.

The second consists of a final test for honours in which only those admitted by the classifying commission may take part, consisting in a work in joinery to be executed in 10 hours on a Sunday, in a workshop to be designated.

The usual types of builders' associations in France have now been briefly described. There is, however, an exceptional type of association existing at Paris which has been formed to deal with certain special exigencies.

It is called the Professional Association of Masonry Contractors of Paris and Seine, and is a limited liability company, with a nominal capital of 186,100 francs. Only masonry contractors of the above districts are eligible as members.

The general object of this company is to give the members of the trade a corporate quality not possessed by the ordinary syndicate or association, and so enable the trade to negotiate as a whole for supplies of materials, etc., etc., on the best wholesale terms.

As this represents a new departure in builders' organisations, I shall give somewhat full particulars of its constitution.

Objects.

1. To serve as intermediary between its shareholders and those who furnish materials and plant employed in construction.

2. To serve as intermediary between its shareholders and the workmen's unions by entering into agreements with them as to wages, hours, etc.

3. To acquire or rent, with or without undertaking to sell, properties situated in France, susceptible of being exploited for the building industry.

4. To let, exploit or sell such properties.

5. To acquire any commercial undertaking of a contractor for masonry with power to retrocede it, in whole or part, to members of the company or to third parties.

6. Finally to take all useful measures for safeguarding the interests of the industry and those adherent; to seek out and execute all improvements presenting economic advantages, profitable alike to contractors and their clients.

The company under objects 1 and 2 acts solely as intermediary, and undertakes no responsibility for the solvency of those who resort to its mediation. Neither does it assume any responsibility towards the latter for either the quality or quantity of the merchandise delivered by the merchants and dealers. nor for delays in delivering or failure to carry out the conditions of the sale.

The members must act directly against the merchants.

The society is formed for a period of 20 years.

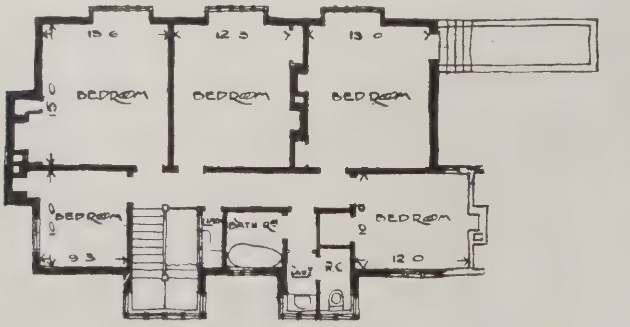
The shares are of the value of £100 each. Allotment takes place on a minimum subscription of 20 shares.

If subscriptions exceed the nominal capital, subscribers receive in proportion to the average amount of work executed by each during the preceding 5 years.

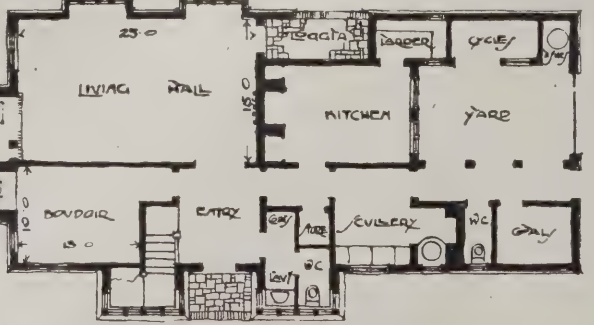
The average is ascertained by doubling the average wages paid to workmen during the said period.

One-fourth only of the subscribed capital is called up.

The share certificates are held by the company as a guarantee of the execution of engagements entered into.



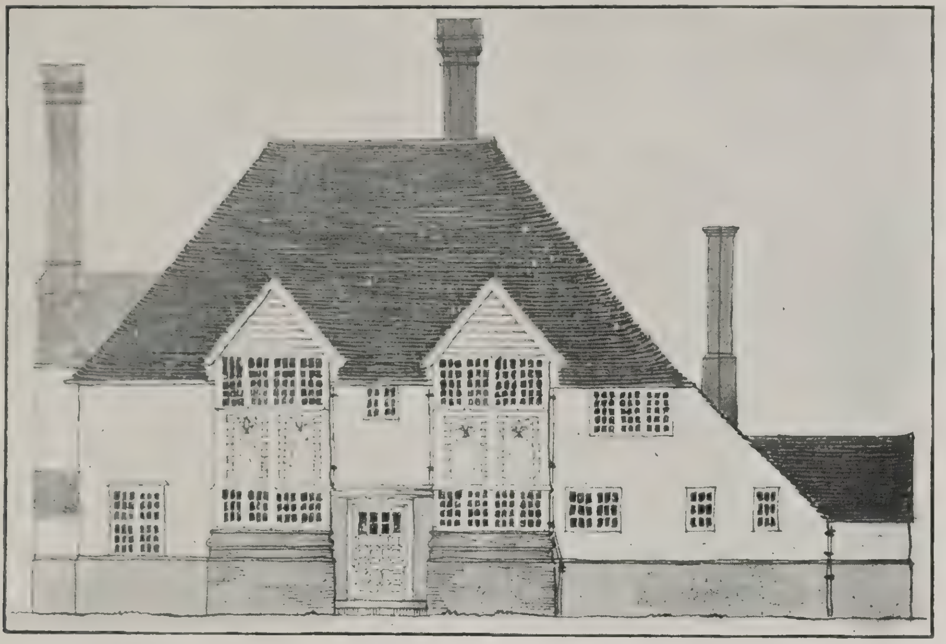
First Floor.



Ground Plan.

DETACHED HOUSE NEAR WOODHAM FERRIS, ESSEX. JOHN W. RHODES, ARCHITECT.

This house is built with a brick base, rough-casted above and roofed with red tiles. Decorative panels in brick and flint, with weather-boarding above, are shown on the front bays.



DETACHED HOUSE NEAR WOODHAM FERRIS, ESSEX. ENTRANCE FRONT.
JOHN W. RHODES, ARCHITECT.

Transfers require the sanction of the Council except where a shareholder transfers them to the purchaser of his business.

The possession of shares implies adhesion to the articles of association and to all decisions of the general meeting, and any regulations governing the internal affairs of the company.

Admission to membership requires the sanction of the Council, but right of appeal to a general meeting exists in case the application is refused.

Those who join the company after its formation must pay on the amount of their shares.

1. A sum equal to that paid by the original subscribers.

2. A sum representing the proportion in the reserve fund appertaining to each share whatever such proportion may be at the time of joining.

Any shareholder has the right to resign membership.

Shareholders becoming defaulters, either as to production of accounts, or as to payment of dues, or other sums, shall be notified by the Council. If they do not remedy their default within a prescribed time or fail to make a valid excuse, they may be proceeded against by law, or expelled the company by a vote of the general meeting.

If a shareholder retires, voluntarily or otherwise, the company will return to him, within a defined time, and after he has cleared himself of all obligations to the company, his original subscription and his share of the reserve fund after deduction of his share of any losses of capital or reserve incurred up to that time. The sum to be repaid bears interest until repaid. The shareholder who retires, remains responsible for five years towards his co-shareholders for all debts or engagements of the company contracted prior to his resignation, not exceeding, however, the total of his shares.

A directorate of 9 to 12 members elected for three years and renewable 1-3rd each year forms the Council of the company, qualification for director, 30 shares.

These shares are held as a guarantee for his acts during his directorship, and may not be sold during that time.

A managing director at a fixed remuneration may be appointed by the Council.

Directors' fees are fixed by the general meeting.

25 per cent. of the net profit is set aside as follows:—

5 per cent. to constitute a reserve fnud.

20 per cent. to constitute a provident fund.

The remainder of the net profit is divided among the shareholders according to their holdings.

When the 5 per cent. aforesaid has resulted in a reserve fund equal to 1-10th of the capital, the earmarking of that amount for reserve fund ceases to be obligatory, and the whole 25 per cent. may go to the provident fund.

When the society expires, and after it has liquidated its engagements, both the aforesaid funds are divisible among the then existing shares. Provision is made for winding up if 3-4ths of the capital is lost.

The reasons which led to the formation of this association are the following; I quote from an official circular:—

"Since the year 1905 the demands of the workmen engaged in the building trade have been incessant."

"It is admitted that: 'There are certain new conditions such as the law requiring a weekly rest-day, the limitation of the hours of work by law, and the increased cost of living, which in part justify their demands, but it must also be admitted that employers have always tried to satisfy all legitimate claims.'

"Led, however, by the groups which they represent, the workers have made unreasonable demands, and not content with reducing their output to an intolerable extent, have accentuated their revolutionary attitude by successive strikes, the blacklisting of employers and the deliberate spoiling of work, material and plant."

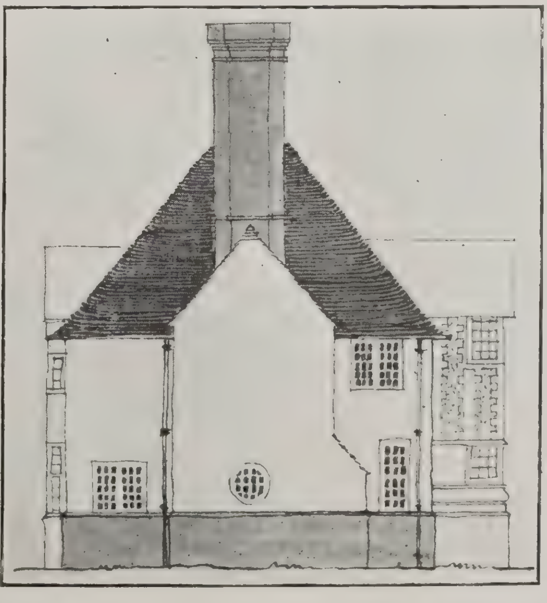
To this the employers opposed a lock-out, which lasted 15 days, when the workmen came in on the employers' terms, which included an increase of wages. The spirit of revolt, however, seems to permanently subsist. A number of press extracts are given in proof of this, wherein the workers advise their members to carry on a passive strike by working, but doing as little as possible all the time, and by refusing to work any labour-saving machinery.

The "ca-canny" spirit is carried to great excess, no consideration is given to the general interest of the community, solely the workmen are advised to on no account produce one more than another, and not to do any task or piece-work, if they do they are mulcted by their society and deprived of any pecuniary advantage gained.

The workmen look to boycotting, the labour label, and to sabotage as their weapons for securing their objects and openly advocate these methods in their official press.

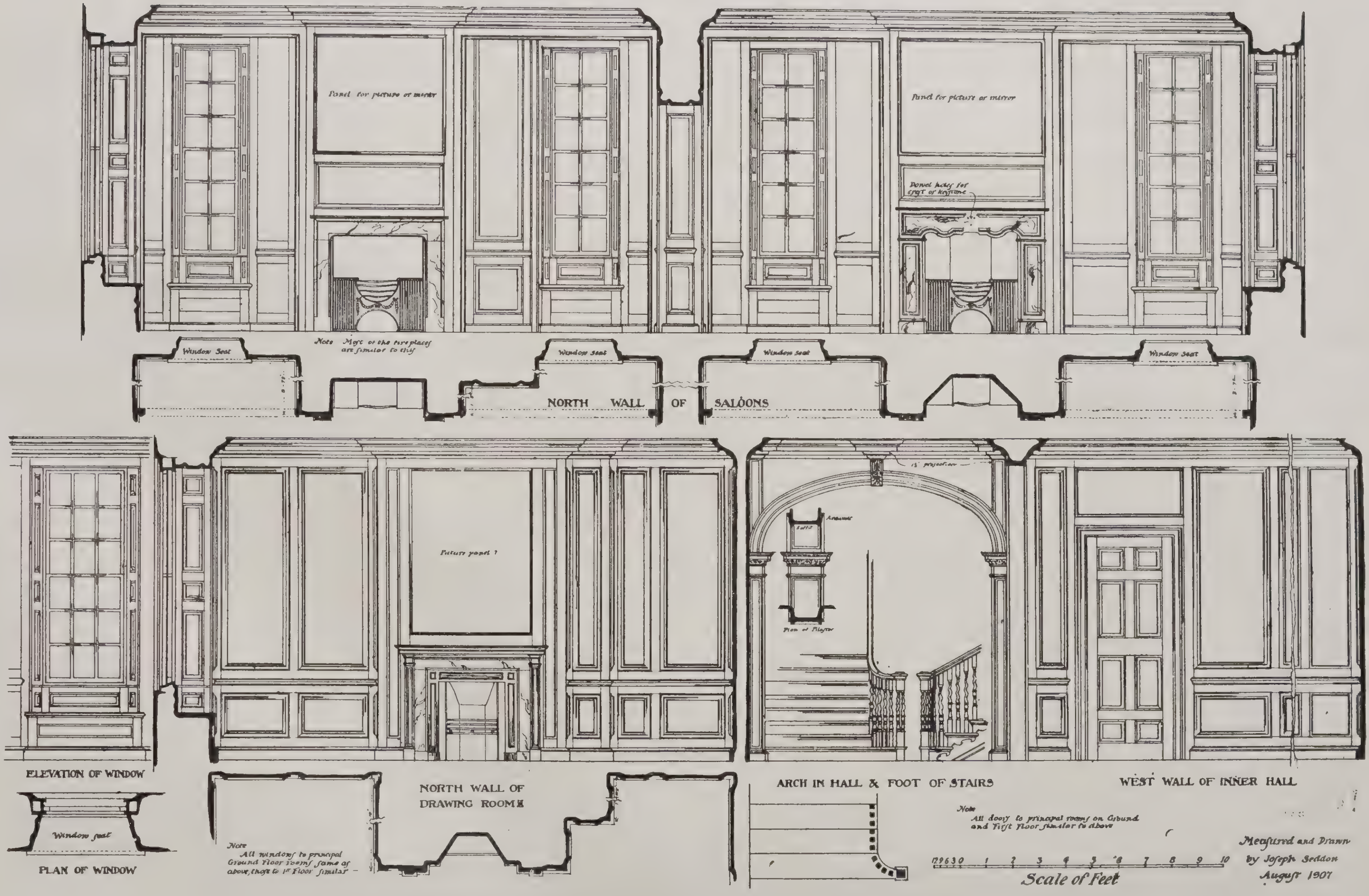
They thus define these three proceedings: Boycotting is blacklisting an employer, merchant or retailer, workmen are required not to work for such and not to consume their products. Sabotage is putting into practice the maxim, "For bad pay give bad work." It is effected sometimes by reducing output, sometimes by destructiveness, sometimes by wasting stock or materials or giving overweight to purchasers, or by rebuffing clients so that they are offended and go elsewhere. Sabotage is carried on by individuals chiefly. It is boasted that the mere threat of it generally suffices to cow an employer. The Parisian hairdressers daubed the shop fronts of their employers with a caustic substance which destroyed the paintwork, and by this means gained their object. During three years, out of 2,000 hairdressers' shops in Paris, barely 100 escaped being treated in this way at least once, and to many it was done several times.

(*To be concluded.*)



DETACHED HOUSE, WOODHAM FERRIS, ESSEX. SOUTH FRONT.
JOHN W. RHODES, ARCHITECT.

EAGLE HOVSE: DETAILS OF INTERIOR


Panel for picture or mirror
Panel for picture or mirror
Panel backs for crest or keystone
Note Most of the fireplaces are similar to this
Window Seat
Window Seat
Window Seat
Window Seat
NORTH WALL OF SALOONS
Picture panel ?
13" projection
Architrave
Soffit
Plan of Pilaster
ELEVATION OF WINDOW
Window seat
PLAN OF WINDOW
NORTH WALL OF DRAWING ROOM II
Note
All windows to principal Ground Floor rooms same as above, those to 1st Floor similar –
ARCH IN HALL & FOOT OF STAIRS
WEST WALL OF INNER HALL
Note
All doors to principal rooms on Ground and First Floor similar to above
12 9 6 3 0 1 2 3 4 5 6 7 8 9 10
Scale of Feet
Measured and Drawn
by Joseph Seddon
August 1907

MEASURED AND DRAWN BY JOSEPH SEDDON. *(See centre plate.)*

LIVERPOOL MASTER BUILDER'S YEAR-BOOK.

The Liverpool Master Builders' Association Year-Book (October, 1909, to September, 1910), is published with the object of providing useful information for those actively engaged or interested in building operations throughout the Liverpool area. Its circulation is not confined to members of the association, but is extended to the principal persons interested in the building trades of Liverpool, such as architects, officials of the various public bodies, etc. It contains a variety of useful information, including the forty-third annual report of the association; forms of contract, apprenticeship indentures, etc.; wages lists; lists of officials and members of the association; extracts from working rules. In a brief historical sketch, it is stated that the association was founded in 1866, with Mr. S. H. Holme as first president. In 1867, the association was instrumental in initiating the form of contract afterwards agreed upon by the Royal Institute of British Architects. The present number of members is 398; and its success is attributed to the fact that on its council there is equality of representation, every branch of the trade having an equal number of representatives.

From the forty-third annual report, which is published in full in the Year-Book, we make the following extracts:—

Several minor complaints by the operative joiners have been dealt with by the committee during the year. The operatives have made a claim against a member for "insulation money" where no insulation material was being used by the firm at the time, the operatives in their letter claiming that all joiners' work at, or for, a cold storage, whether insulation material is being used or not, comes under the rule, and the men are entitled to sixpence per day extra. The employers met the operatives under Rule 17 (Board of Conciliation), but were unable to come to a settlement. It was then referred to the local Conciliation Board, who also failed to agree, and the matter has now been referred to the Northern Centre Conciliation Board.

The operative masons approached the association with a view to some arrangement being arrived at whereby "worked stone" should be prohibited from coming into Liverpool from towns where wages are paid at a lower rate than here. The employers' committee fully discussed the matter, and communicated to the operatives that as there is such a strong feeling amongst the employers against any "worked stone" rule, it would be useless to discuss the matter further.

The operative masons have approached this association with a view to an alteration in leaving off time on Saturdays from 12.30 to 12 o'clock, and the Council and committee have intimated that this association will consent to the alteration being made, provided the bricklayers and joiners also agree to adopt the same leaving off time. The joiners have not yet signified their approval, but should they do so notice will be sent as to when the change is to come into force.

Six months' notice, expiring May 1st, was given to the operative bricklayers, for a decrease in wages of three-farthings per hour; the working hours to be 47 per week for the summer months, 44½ during November and February, and 42 during December and January. All rules, except those relating to wages, hours, and starting times, to be expunged. A counter-notice was received from the bricklayers for an increase in wages of one penny farthing per hour, with extra lodging money, double time for all overtime, limitation of apprentices, etc., leaving the hours of work and all other rules as before. A conference was held with operatives in April last, when the matter was referred to the Local Conciliation Board, who came to no settlement. The matter had, therefore, to go before the Northern Centre Conciliation Board, who decided that the hours of work should be as in the employers' notice; the wages to be increased one farthing per hour; rules relating to meal hours and starting times to be altered according to the new hours; and all other rules to remain the same. The rules are not signed yet, owing to the question of the 12.30 leaving off time on Saturday being in abeyance, as referred to above. Several complaints have been received that members are not adhering strictly to the rules with regard to the time of starting their men in the morning. As the breaking of rules by employers is bound to lead to unpleasantness with the operatives in the end, the Council trust that all members will strictly adhere to the rules agreed upon.

BUILDER AS LORD MAYOR OF BRISTOL.

To the building trade of Bristol has fallen the honour of providing the prospective Lord Mayor. At the meeting of the City Council on November 9th next, Mr. Christopher Albert Hayes, of Salisbury House, Stoke Bishop, will be proposed for the office. Mr. Hayes was born at Clifton in 1850. He was educated privately, and afterwards apprenticed to his uncle, Mr. J. Hayes, of the firm of Messrs. Hayes and Son, builders and contractors, of Bedminster. After serving his apprenticeship, he went to London, where he held important positions with some of the principal building and contracting firms. Returning to Bristol in 1873, he founded the business now carried on by Messrs. C. A. Hayes and Sons. He has carried out many important contracts in Bristol and elsewhere.

(*Photo.* "*Bristol Observer.*")

Mr. Hayes has been connected with the Bristol Master Builders' Association for many years, and occupied the position of president in 1896.

Owing to the alteration in the bricklayers' hours, the question of what wages should be paid to the labourers was considered by the bricklayers' committee, and also the Council of the association, who recommended that members should pay hod-carriers at the rate of 6½d. per hour, but this rate only to be paid when the men are carrying the hod, and not when hod-carriers are engaged doing ordinary labourers' work. All other labourers to remain as before.

Early in the year the operative painters struck several jobs owing to the men having been taken on at the jobs and the employers refusing to pay walking time and expenses. The employers offered to discuss the matter under Rule 16 (Conciliation Board), but the operatives objected, and the employers then gave the operatives notices that owing to the rules having been broken by them and the conciliation procedure thereunder disregarded by them, no working rules whatever would be recognised as existing between this association and their society. Several conferences subsequently took place, but without any satisfactory conclusion. The employers have offered to submit the rule to arbitration, but this the operatives object to. The Council trust that all members will refuse to pay walking time in cases where the men are taken on the job.

Several interviews have taken place between the employers' committee and the operatives, with regard to encroachment on plumbers' work.

The Corporation Baths Committee have now decided to allow master plumbers to tender with heating engineers for hot and cold water services.

A conference took place in October last between representatives of this association and the water engineer, who agreed that the time had arrived when new regulations should be drawn up, and promised that this should be done, and that before having same finally approved, he would submit a draft to this association for its consideration and suggestions. The water engineer has been recently approached again, and he informs the Council that the matter is receiving his careful attention. It is hoped that the new regulations will be framed shortly.

At the suggestion of Mr. J. B. Johnson, a member of this association, the National Federation decided to go into the question of having the National Agreement with operative plasterers amended. A special joint meeting was appointed of the National Federation of Building Trade Employers and the National Association of Master Plasterers, with the result that a new agreement has been drafted, and the draft was submitted to the Plasterers' Committee of this association, and approved. The joint committee consisted of one master plasterer from each of the four centres, four builders' members of the National Administrative Committee, and four members from the National Association of Master Plasterers. Mr. J. B. Johnson was the member elected to represent the Northern Centre.

With respect to conciliation boards, the Northern Centre asked each association in the Northern area to consider the following two questions:—"(1) Are you in favour of the Northern Centre withdrawing from the scheme? (2) Can you suggest any alterations in the rules which will improve the working of the scheme, and prevent friction arising thereunder?" This association appointed a special committee to go into the matter, and consider same, and forwarded the following resolution in reply:—"That this committee considers the experience of Liverpool under the conciliation scheme has proved unsatisfactory, and we are in favour of withdrawing from the scheme." With regard to the second query, it was decided that there was nothing to suggest. The resolution of Liverpool received very little support at the Northern Centre meeting, with the result that the Conciliation Boards still continue.

The Board of Trade forwarded a memorandum to this association with regard to a court of arbitration that the Board intended forming, and the same was fully discussed, with the result that this association wrote approving of the principle of the scheme, and requesting that some building trade employers should be included in the panels, and also suggesting that any Board appointed to consider a dispute in the building trade should consist, on the employers' side, of gentlemen engaged in the building trade.

In a previous report it was stated that this association had approached the Architectural Society with a view to a sum being inserted in the quantities by architects for the cost of attendance on specialists. This the Architectural Society agreed was reasonable, and recommended their members to carry it into effect. This association, early in the year, again approached the Architectural Society, with a view to their again calling their members' attention to the recommendation, and this was done. Some architects, however, still continue on the old lines, and act contrary to their own society's recommendation, but it is trusted that before long all architects will carry out the suggestion. The committee strongly urge all members to insist upon a lump sum being inserted in all quantities to cover attendance on specialists.

It was resolved at a meeting that it is desirable that an honorary members' committee be formed. A further meeting of honorary members will be called to appoint a special committee of six, to confer with six members of the Council, as to the scope of the proposed committee.

In August last the Belgian builders, to the number of about 100, visited Liverpool, and this association were asked by the Yorkshire Federation (who had invited them to England), to look after the visitors during their one day's stay in Liverpool. The Council drew up a lengthy programme for the Belgians, who thoroughly enjoyed themselves.

Considerable correspondence has taken place between the various committees of the Corporation and this association, as to the large amount of work done by the Works Department, and though no satisfactory conclusion has yet been arrived at, it is thought that the correspondence will result in more work being put out to public competition.

This association has been kept in close touch with Birkenhead and Wallasey through the Mersey Federation, and the bricklayers' rules in Birkenhead have been altered almost entirely in the same manner as the Liverpool rules. The Federation has also been able to render its influence and support in reference to the obtaining of quantities, etc., and making objection to unfair conditions and practices, in cases raised by the federated associations. The Federation is now taking up the question with the Birkenhead Town Clerk, as to the appointment of an independent arbitrator in all Corporation contracts.

Several communications have been addressed to corporate bodies and architects respecting the conditions of contracts and invitations for tenders, etc., especially in reference to tenders being required without quantities being supplied. In certain cases the association intervened successfully.

The attention of the association was called to the practice of quantity surveyors cutting down as much as possible the items in their quantities to the detriment of the builder, and communications were addressed to the Quantity Surveyors' Association, the Liverpool Architectural Society, and the City Surveyor. Favourable replies were received; the City Surveyor stating that he would take up any particular case if the association would specify it. The association is at present in communication with the Quantity Surveyors' Association, London, with a view to obtaining a uniform system of taking out quantities.

The "Builders' Journal and Architectural Engineer" is now the sole official organ of the National Federation. This Journal is, without doubt, a very useful and practical technical Journal, and a certain portion of the paper is devoted each week to Federation news. The council have decided to recommend the members to give this Journal every support, and it is trusted that all members will become subscribers, and so keep in touch with association and Federation matters through this official organ.

Members are reminded that they should insist on all their apprentices attending the evening technical classes, in accordance with their indentures. Afternoon classes are formed for young boys during the first two years of their apprenticeship, who are not eligible, owing to their age, for the evening classes. The time spent at the afternoon class is reckoned by their employers as working time. In this way the boys become interested in their work, and are the more ready to join the evening classes when they become old enough to do so. The Council recommend that all employers should give these afternoon classes their support, by sending their younger apprentices. The Council has decided to place the sum of about £11 per annum at the disposal of the Technical Instruction Committee as a prize fund for the building trade students, and this will be principally awarded to encourage regular attendance.

The Council hope that members will strictly adhere to Rule XIV. B, which is as follows:—"Members shall not give or take tenders for any work to or from any persons who are not members of this or kindred associations connected with the building trade, and shall not employ such persons to do work for them."

Trade and Craft.

Wait's Adjustable Attachments for Rule and Measuring Rod.

Mr. Edwin Wait, of 9, Liverpool Road, Thornton Heath. Surrey, has patented some small and neat attachments for the rule and measuring rod. The attachment shown in Fig. 1 is a clamp that can be used as a gauge by securing it to a rule as shown in Fig. 5, and, accommodating a bradawl as a centre, is serviceable for striking curves or circles as illustrated by Fig. 4. A fine steel point, fitted to the attachment shown in Fig. 2, dispenses with the use of a bradawl, and, when not in use, folds up into the fence, so that the adjustment can be employed as indicated in Fig. 5. Fig. 2 will hold a pencil, drawing pen, or steel point, and is adapted for use with either Fig. 1 or Fig. 2, when the rule is employed as a beam compass or trammel as shown in Fig. 4. These adjustments are well made and finished, and are very cheap. All who have to do with setting out or marking off, or with the ordinary processes of the draughtsmen's office, will welcome these instruments as an efficient substitute for the marking gauge, or as an exceedingly handy and convenient aid to accuracy and neatness in several other operations.

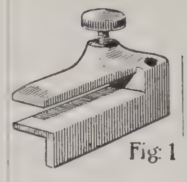


Fig: 1

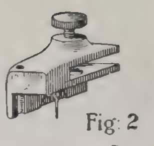


Fig: 2

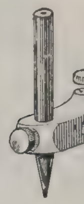


Fig 3

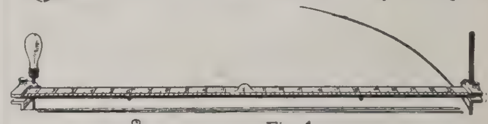


Fig 4.

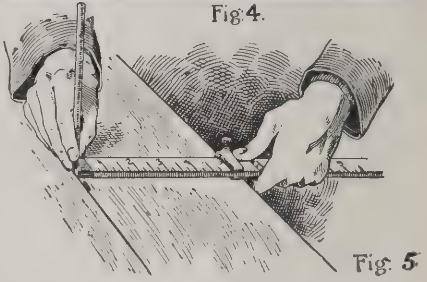


Fig. 5

Twyfords' Sanitary Fittings.

Messrs. Twyfords, Ltd., Cliffe Vale Potteries and Enamelled Fireclay Works, Hanley, have issued "Interim Catalogue E," which illustrates a few of their leading productions in lavatory basins, w.c. basins, etc., which, while based on old and well-known patterns, have been re-designed to meet present-day requirements, by eliminating all mouldings and sharp angles, and substituting plain surfaces and rounded edges. The strength of these basins has been increased, and the risks of shipping are very much reduced, while the curves and plain surfaces facilitate cleanliness, the total result being that the new designs are more attractive, and at the same time represent a considerable improvement from the hygienic standpoint. In addition to the revision of the older patterns, the firm have included several entirely new designs. The most important of these are the pedestal lavatories illustrated on the first few pages of the catalogue, and these embody the new features already mentioned. All the goods in this list are made in the fine white "C.V." ware, which is guaranteed non-crazing, while for purity of colour, evenness of surface, and durability, it is claimed that there is absolutely nothing superior on the market.

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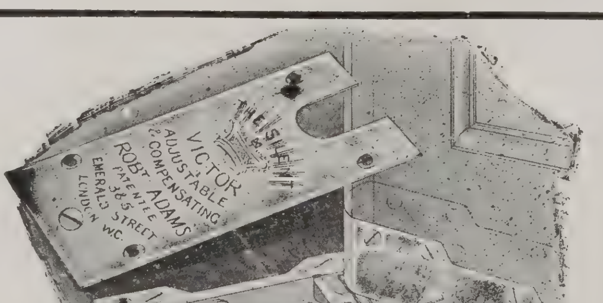

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ELECTED MEMBERS.

Northern Centre—T. WILKINSON (Middlesbrough). W. R. THOMPSON (Dewsbury). GEORGE MACFARLANE (Manchester) JAS. STORRS, J.P. (Stalybridge).

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Secretary:

A. G. WHITE, 31 and 32, Bedford Street, Strand, London, W.C.

MONTHLY OFFICIAL REPORTS.

THE NATIONAL FEDERATION.

Builders' Locked-up Capital.

At the recent meeting of the Administrative Committee, reference was made to the great importance of the question treated of in the articles bearing the above title, which appeared in the Official Journal under dates 1st and 22nd September, when Mr. Smethurst, a representative from the Northern Centre, said this question was attracting so much attention in that district that there was no doubt whatever but that the committee would shortly receive a very strong request for action to be taken against, and a remedy found for, the abuse of credit involved in this question.

Revised Agreement with the N.A.O.P.

The resolution passed by the half-yearly meeting authorising the completion of the above agreement subject to a rider in regard to London, was duly communicated to the N.A.M.P. and N.A.O.P., who respectively signified their adhesion thereto and signed the document, whereupon it was also signed by the President and Secretary of this Federation and dated 1st September, 1909. The new rules are issued, and it will be necessary for the appointment of local joint committees to be proceeded with on similar lines to those existing for the conciliation scheme.

Leasehold Tenure and Building Operations.

Information is desired at Grimsby as to the practice elsewhere in regard to charges for licenses for converting leasehold dwelling houses into business premises. In Grimsby, agents of landowners are enforcing charges for surveyors' and solicitors' services besides increasing the amount of the ground rent.

Organisation.

Correspondence has been initiated, which it is hoped will lead to the formation of a builders' association at Normanton. This has come about through the Official Journal getting into the hands of a builder there, causing him to write for information. Secretaries are requested to note the advantageous use which may be made of the journal in thus enlarging our organisation.

The secretary has received a visit from a builder at Carmarthen who desires to initiate the formation of a local association of builders there. Information had been given and help tendered, and the secretary of the South Wales Federation advised.

Some enquiries from individual builders in the west as to membership have been dealt with, and the County Federation secretary advised.

Collective Purchasing.

The question of collective purchasing of builders' materials is engaging the attention of one of our important local associations, and information on this point has been prepared by the National Secretary and may be availed of by any association.

Winter Meetings.

The following circular has been sent to the county federations:—

24th September, 1909.

ORGANISATION.

Dear Sir,—I shall be glad to hear that your Federation intends to make some endeavour to extend its membership during the coming winter.

Please note that I am available by arrangement to address meetings anywhere, and shall be only too pleased to render to your Federation assistance in this work.

Trusting to hear from you in due course,

Yours faithfully
A. G. White,
Secretary.

International Facilities for Students.

The secretary had recently an application from Paris on behalf of a student of the Special School for Public Works and the Building Trade, who desired to spend his vacation in gaining practical experience on works in this country, and, through the kindness of Mr. Nicholson, was enabled to arrange for his doing so with Messrs. Baldry and Yerburgh, who are engaged on railway construction near Hull. The young man reports having received every courtesy and much valuable instruction through this experience. The secretary has also been spoken to by two of the Belgian builders who lately visited us, who desire their respective sons to spend six months in England next year for a similar purpose, including practice in the language. In each case the suggestion is to give any services they are capable of giving in exchange for the privilege. Apparently there is a willingness to exchange opportunities if there are any builders who desire similar facilities for their sons, and the secretary proposes therefore to communicate with the county federations and through them to the local associations on this subject, and if it appears that there is a disposition to exchange privileges in the manner suggested, will use his good offices to bring them about.

The Northern Centre.

Secretary: James Denver, Cromwell Buildings, Blackfriars Street, Manchester.

Lancashire, Cheshire, and North Wales Federation.

of local associations connected with the Lancashire, Cheshire, and North Wales Federation, was summoned to be held at the Federation Board-room, Manchester, on Wednesday, September 29th, but as at the time for opening the proceedings there were only five local secretaries present, it was decided not to proceed with the business.

The Organising Sub-committee met on September 29th, and discussed their operations for the winter months.

The monthly meeting of the Administrative Committee was held on Friday, October 8th, but their report is not yet to hand.—John Tomlison, secretary, Cromwell Buildings, Blackfriars Street, Manchester.

LEIGH AND DISTRICT ASSOCIATION.

Secretary: S. Wigham.

At a meeting of the Master Painters, held at Higson's Restaurant, Market Street, Leigh, on Friday evening, October 8th, it was unanimously decided to give the operative painters six months' notice to adopt the following rules, to take effect from May 1st, 1910:—

1. Wages.—The standard rate of wages to be 8½d. per hour. No piece work allowed. Any member working in a sling or skip on mills, etc., to receive ½d. per hour extra.

2. Hours of Work.—Work shall commence on Monday at 8 or 8.30 a.m., at the option of the employer, and finish at 5.30 p.m. On Tuesday, Wednesday, Thursday, and Friday, at 6.30 a.m. till 5.30 p.m. On Saturdays, 6.30 a.m. till 12 noon. All men to leave off work in time to be at the shop at 12 noon on Saturday.

3. Overtime.—All time worked after 8 p.m. until 12 p.m. to be paid at the rate of time and half, and from 12 p.m. to 6.30 a.m. double time. On Saturdays, after 12 noon until 6 p.m. time and half, and from 6 p.m. until 8 a.m. on Monday, double time. On Christmas Day and Good Friday, 6.30 a.m. to 6 p.m., time and half; before or after these hours, double time.

4. Country Work.—Men employed on jobs above three miles and under fifteen miles from shop, 3s. 6d. lodgings and railway expenses to be allowed in and out once a week; if over fifteen miles and under forty miles, one a fortnight. If over forty miles, by special arrangement; but in no case to be over four weeks, and in all cases to be at the shop at 12 noon on Saturday, returning. 2s. to be allowed staying over Sunday.

5. Apprentices.—That one apprentice be allowed to three men, and no more than two be allowed in any shop, excepting during the last year of any apprentice, when another may be engaged to succeed him.

6. Labourers.—That no labourer be allowed to burn off paint, knot, putty up, or mix paint, or do any recognised painters' work, except limewashing, scraping ironwork, stripping paper, cleaning out gutters, and conveying materials to and from job.

7. Workmens' Responsibility for Tools.—That each workman shall be held responsible for all tools entrusted to his care, and shall make good any damage or deficiency (ordinary wear and tear excepted) before his full wages be paid.

8. Undertaking other work.—That no workman shall undertake jobs on his own, without the consent of his employer.

9. Alterations of Rules.—That no alteration be made in these rules either by the employers or operatives without giving six months' notice of same. The notice to expire on the last day of April.

LIVERPOOL ASSOCIATION.

Secretary: Bertram B. Moss.

The forty-third annual general meeting of the Liverpool Association was held on Tuesday, October 5th, in the Board Room of the association, 24, Sir Thomas Street. The chair was occupied in the earlier proceedings by the retiring president, Mr. Frank Griffiths, and there were also present many past presidents, officers, and members. The annual report, dealing with various matters of importance to the trade, and the treasurer's statement of accounts, were read and approved. Mr. R. Arthur Costain was elected president for the coming year. The newly-elected president, on occupying the presidential chair, having thanked the association for the honour conferred upon him, said: "One thing that has struck me during the time that I have taken an active part in the work of this association is the attention that has been given by your presidents to the work which they have undertaken; so that, within my own knowledge, for the past four years or so, there has hardly been one meeting of the association, council or committee, that has not been presided over by the president for the time being. What this has meant you have some idea of when you know that the local meetings have averaged something over 60 per annum, to say nothing of special Federation and other meetings held out of Liverpool.

"It is not my purpose to inflict on you any speech on this occasion, but there are one or two words which I wish to offer, bearing on the report which has been presented to you.

"It will be within the observation and experience of everyone present that our trade has passed through a period of very great depression for some years past, and we can only hope that we have now reached such a point that any change must be for improvement.

"It seems to me fitting to call the attention of the members of our association to the fact that the good work undertaken by your officers and council in the direction of improving the organisation of the association has borne such good fruit that it may be said at the present moment to be complete. Not only does this association comprise, as members, almost every firm connected with the building trade of our city, but we are also linked up as an association with the whole country. In the first place, we are brought in touch with the building trade of Birkenhead and Wallasey by means of the Mersey Federation, and we are also linked up with the trade of the two counties of Lancashire and Cheshire, and with North Wales by means of the Lancashire and Cheshire and North Wales Federation. We are also linked up with the whole of the North of England by means of the Northern Centre Federation; and finally all these federations are brought in touch with similar bodies throughout the whole country by means of the National Federation of Building Trades Employers.

"If there is anything remaining to be done that might improve the conditions under which our business is carried on, it may surely be thought that in such an organisation as this, we have machinery capable of achieving the object in view; and I therefore ask all the members present, and all the other members of our association, to give their most hearty support to any proposal that may seem advisable to your council that they should adopt, with this object in view. In fact, to justify the amount of energy and time that is occupied in carrying on such a series of organisations as ours, it seems to me necessary that a step forward should be taken; and the conditions under which our trade has been carried on during the past few years render it imperative that something should be done.

"In the past, on all occasions when demands have been made by the operatives, which in our opinion were either unreasonable or not justified by the condition of trade, there has been no difficulty in securing the active and earnest co-operation of the various individual members of our association, and we have stood loyally together as one man in mutual support against what we conceived to be contrary to our mutual interests. But, gentlemen, I would remind you that relations with the operatives are

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not the only conditions with which we have to contend; and it is imperative, if we are to be enabled to carry on our trade in a satisfactory manner, that the same spirit of loyalty should be observed among us when other matters are under consideration, as has been usual in our dealings with the operatives. This can only be achieved by our being inspired with mutual confidence in each other, and it is to this that I specially wish to exhort you this evening, namely, that in any matters that may arise in which we may be called to have dealings with one another, we should consider that we are dealing with honourable gentlemen. In this way we should be in a position to receive from such an organisation as we represent, such mutual support as will enable us greatly to improve the conditions of our trade. The illustration used by the Old Romans will clearly bring home this point, when they spoke of the weakness of the single rod, which can be easily broken when dealt with by itself, but which when bound in association with other rods, presents such an obstacle as can hardly be overcome. I therefore ask you to pledge yourselves on your own behalf, and as far as lies in your power on behalf of those members who are not present, to give every possible support to your officers and council in the work which they will undertake on your behalf in this direction during the coming year, so as to achieve a step forward in our organisation. In closing, I would ask you to signify your approval of the good work done in the past by your officers and council, and especially by your retiring president, by according to Mr. Frank Griffiths a hearty vote of thanks for the splendid services which he has rendered to us, as president, during the past year."

This latter request was seconded by Mr. Chas. Tomkinson, the senior past president, and new senior vice-president.

Mr. Griffiths suitably replied.

The following further officers were also elected: Mr. Chas. Tomkinson, senior vice-president; Mr. R. Stevenson Jones, junior vice-president; Mr. J. T. L[illegible]thie, treasurer; Messrs. H. E. Dallow and [illegible] Sirett Brown, honorary auditors. Thirty-six members were elected to form the council for the ensuing year. The council is divided into six trade committees representing the bricklayers, masons, plasterers and slaters, carpenters and joiners, painters, plumbers and glaziers, and electricians

Various matters relating to dealings with the operatives were discussed.

Mr. J. B. Johnson brought forward the question of forming a Building Trade Exchange, and after considerable discussion, the matter was referred to the council for consideration.

The meeting terminated with a vote of thanks to the secretary, Mr. Bertram B. Moss, on the proposition of Mr. Hans E. Hughes, seconded by Mr. Frank Griffiths, the retiring president, and supported by the newly-elected president.

MANCHESTER, SALFORD, AND DISTRICT ASSOCIATION.

Secretary: J. Tomlison.

The monthly meeting of the Master Stonemasons' branch of the Manchester, Salford, and District Association, was held at the Board-room, Blackfriars Street, on Thursday, September 30th, when Mr. Wm. Deakin presided.

Matters of branch trade interest were discussed. The members, after the close of the meeting, retired to the Victoria Hotel for tea.

The Plasterers and Painters' Branch Committee met at the Board-room on Tuesday, October 5th. The question of the fixing and finishing of plaster partitions was the chief matter under consideration, and a deputation of manufacturers attended for the discussion. Ultimately a scheme was suggested to lay before each branch.

OLDHAM AND DISTRICT ASSOCIATION.

Secretaries: Cowper and Dean.

The Executive Committee of the Oldham and District Master Builders' Association have for some considerable time been dealing with the question of securing an arbitration clause in the contracts of the Oldham Corporation, so as to make same applicable to the fair contracts clause which is now inserted in their form of contract. The matter was finally settled by the committee on Monday, October 11th, when the opinion of Messrs. Ascroft, Maw and Shimeld, solicitors, Oldham, was read. The following is a copy of the letter received from such solicitors, and the matter is now finally disposed of so far as the differences between the Oldham Corporation and the Oldham and District Master Builders' Association are concerned.

[Copy of Letter.]

"FAIR CONTRACTS CLAUSE.

"We have now had an opportunity of considering the question of the right to appeal in respect of fair contracts clause adopted by the Town Council, July 7th, 1909, copy of which Mr. Dean left with us on Monday last.

"It would appear to us that if the clause had to stand by itself and be signed, the contractor who felt aggrieved by any decision of the Corporation would have the right to appeal at common law.

"We understand, however, that such clause would form one of the clauses to be incorporated in a full agreement made between the individual contractors and the Corporation, and that such agreement contains an arbitration clause.

"In our opinion such arbitration clause would apply to the fair contracts clause.

"We understand from Mr. Dean that you desire us to draft a slip which could be attached to any tender submitted to the Corporation by any contractor.

"We do not really think that any such slip is necessary, but it would certainly do no harm, and we should therefore suggest that a slip with the following words thereon might be printed and attached to each tender:—

"'This tender is in case of acceptance, subject to a condition that any contract to be entered into with reference to the performance of the work to which this tender relates, shall contain a clause providing that disputes arising out of or relating to such contract, shall be referred to arbitration pursuant to the provisions of the Arbitration Act, 1889, and any Acts amending or extending same.'

"Yours faithfully,

"(Signed) Ascroft, Maw and Shimeld."

PRESTON ASSOCIATION.

Secretary: John Tomlison.

The nineteenth annual general meeting of the Preston Association was held at the association offices, Mount Street, Preston, on October 6th, when Mr. T. B. Garnett (joiner and builder), at the commencement of the proceedings, presided over an attendance of about 60 members.

The half-yearly report of the committee stated that the strength of the society had been well maintained, there being 186 members on the books. The year, so far as the association was concerned, had been a very successful one in spite of the depression in trade, and it was cause for congratulation that the committee had been able to alter, furnish, and equip the new premises at considerable expense without trenching on the invested funds. The question of registering the premises as a club was having attention. Draft rules had been prepared, and it was hoped to utilise the rooms for social gatherings of the various branches of the trade during the winter months, in addition to the usual united functions. This would necessarily entail further expense; but with a continuance of the present membership the association was well able to bear it. Details of the work of the association during the half-year were given, and the report as a whole was unanimously adopted, as were also the annual statement of accounts and the balance sheet.

On the motion of the chairman, Mr. R. H. Catterall (master plasterer) was elected president of the society for the ensuing year. Mr. S. Salthouse (plumber and painter, etc.), was elected the senior vice-president; Mr. James Croft (of T. Croft and Sons, Ltd., builders), junior vice-chairman, and Mr. W. Cooke, jun. (plasterer), hon. treasurer.

Under the new rule, the election of the general committee was by ballot, each branch trade having previously nominated fifty per cent. more candidates than the number of representatives they were entitled to.

A proposal to amend the rule which prevents a member going on to a job where another member has the contract incomplete, or he has been paid off, or has given permission in writing, or by the permission of the committee, was defeated; the proposal being to exempt jobs where the contract is let in sections, or the work of the second em-

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ployer or contractor is for furnishing or fittings, or for decorations for which a p.c. sum has been allowed in the original quantities.

The usual votes of thanks were passed during the meeting, and at its close.

SUNDERLAND AND DISTRICT ASSOCIATION.

Secretary: W. H. Hope, Solicitor.

A meeting of the Executive Council held in the Board Room on Tuesday, September 21st, Mr. R. J. Huntley presiding.

A letter was read from the joiners' society stating that they desired one starting and finishing time for both inside and outside men during the winter period, and that if this were agreed to they were willing to accept the employers' proposals. It was unanimously resolved to agree to this

Arising out of the matter of the working rules, the question was raised as to the rates of wages paid to apprentices and the hours of labour worked by them during the summer and winter period.—On the proposition of the president, seconded by Mr. J. M. Wright, it was resolved "that a circular be drawn up asking for the necessary information, and forwarded to the members requesting them to return it completed."

The secretary reported that he had sent a draft of the proposed rules to the bricklayers' society, who had replied asking for the insertion of fixed meal hours.—It was resolved unanimously not to agree to fixed periods.

The application of the wood-cutting machinists asking for representation upon the Conciliation Board was discussed; and, on the proposition of Mr. J. W. White, seconded by Mr. A. Stafford, it was resolved "that as the society are not represented upon the National Conciliation Board, the Sunderland Board cannot agree to their being represented upon the local Board."

The secretary reported that the stonemasons' society had agreed to and signed the altered working rules, which were accordingly signed by the employers.

The question of holding a dinner this year was discussed, and, on the proposition of Mr. J. W. White, it was resolved: "That this Executive Council recommend that an association dinner be held this year on the evening of the day of the Northern Counties' Federation visit to Sunderland in December, and that the Board of Representatives be invited to the dinner."

BRADFORD ASSOCIATION.

Secretary: J. Davidson.

At the meeting of the Bradford Association held on September 28th, Mr. R. Raper, senior vice-president, in the chair, gave a report of the proceedings of the Yorkshire Federation, and drew special attention to matters in which members had had disputes with architects. The matters discussed were of great interest to the members, and were felt to be of considerable trade importance.

MIDDLESBROUGH ASSOCIATION.

Secretary: Walter Rigby.

The monthly general meeting of the Middlesbrough Association was held in the Corporation Hotel on Tuesday, October 5th, at 7.15 p.m., the president in the chair.

At a previous meeting Mr. P. Bray drew attention to a new order of the Corporation in reference to the height of back bedrooms partly in the roof. The secretary reported that, as instructed, he had written to several other towns for information as to their custom in such cases, and had received several replies. Mr. Bray, however, informed the meeting that during the month, through one of the councillors, a member of the association, the matter had been very satisfactorily settled. The builders were advantaged by the settlement, and the meeting expressed their satisfaction at the result.

A letter was read from the Teesside Association secretary containing a request from the Middlesbrough labourers, that they might become parties to the conciliation scheme and members of the Board. The ruling of the National Federation upon the labourers' case was read, and after some discussion it was decided to suggest that in accordance with the National rules, the Middlesbrough labourers be allowed to join the local conciliation board.

After the meeting, a smoker was held under the presidency of Mr. W. Masters. There was a large gathering of members and friends, including several Teesside Executive Committee, who came as the guests of the association.

WAKEFIELD AND DISTRICT ASSOCIATION.

Secretary: J. Beaumont.

The first meeting after the vacation of the members of this association was held at Bull Hotel, Wakefield, on October 7th. Mr. Tom Lee (president) was in the chair.

Before commencing the business of the meeting, the president made feeling reference to the recent death of Mrs. Fallas, the wife of Mr. Henry Fallas, an ex-president of the association, and the association's representative on the Yorkshire Executive Council, and moved a resolution expressing the deep sympathy and condolence of the members with Mr. Fallas in his bereavement. The resolution was passed in silence, and the secretary was directed to communicate the terms of the resolution to Mr. Fallas.

After the minutes of the last meeting had been, on the motion of Mr. J. W. Bramham, seconded by Mr. J. Pashley, read and confirmed, the minutes of the recent meetings of the Yorkshire Federation were read, and various questions dealt with at such meetings were discussed.

Arising out of these minutes, and correspondence from the Federation, it was decided, on the motion of Mr. E. A. Elvey, seconded by Mr. F. Clark, that a sum of £5 be remitted to the Yorkshire Federation treasurer for balance of subscriptions of the members of the association, and a remittance of £2 10s. as a further donation to the National Reserve Fund was directed, on the proposition of Mr. Elvey, seconded by Mr. J. W. Sanderson.

A letter was read from Mr. J. Davidson, the secretary of the Yorkshire Federation, in reply to one from the association stating that an official report of the Continental Town Planning Tour, arranged by the National Housing Reform Council, had been prepared and, on the proposition of the president, seconded by Councillor Spink, the secretary was directed to obtain a supply of printed copies of the report and distribute same amongst the members.

SOUTH SHIELDS ASSOCIATION.

Secretary: J. G. Robertson.

The monthly meeting of the South Shields Association was held in the Victoria Hall on Tuesday, October 5th, Councillor J. T. Armstrong presiding over a fair attendance.

After the minutes had been read and adopted, the question of the glaziers' reply to our letter was dealt with. The reply was not deemed satisfactory, and the secretary was instructed to write to them again asking them to arrange that a profit shall always be retained for the builder and contractor, and that outsiders be not able to buy at the same rate as those in the trade.

General satisfaction was expressed at the fact that the stamp duty had to remain as it was for property under £500, Federationists believing that this concession was in part due to the movement they initiated against an increase in the duty.

The secretary drew the members' attention to the articles that had apppeared in the "Builders' Journal" re architects and retention money. The meeting expressed itself as deeply grateful for the bold stand the Journal had taken on this question, and they trusted that as a result of the exposure made some at least of the most glaring cases of retaining money long after it was due would come to an end. The members were in hearty accord with any scheme that would help to bring about a better state of affairs, believing that the locked-up capital had a most disastrous effect on builders and the building

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trade generally. They ended by wishing the Editor of the "Builders' Journal" "more power to his elbow" on this most important and vital question.

The question of insurance was discussed, but eventually it was agreed to remain in the same company as at present.

The meeting then considered carefully, especially in view of the litigation that is going on between the South Shields Corporation and the contractors for the new Town Hall, the decision in the Derby case of the Court of Appeal as summarised in last week's "Builders' Journal." A long general discussion ensued, the members practically being unanimous in their views of the matter. Eventually it was resolved to send a very strong resolution of protest from the branch to the Corporation, together with a copy of the decision of the Court of Appeal on the question of the architect as sole arbitrator, and to ask them even at this late stage, especially in view of the Court of Appeal's decision, to try to get the matter settled without further costly, and what was believed to be useless and vexatious, litigation.

On the motion of the chairman, the secretary was unanimously appointed to attend the secretaries' conference to be held at Leeds.

Midland Centre.

The usual quarterly meeting of the Executive Council of the Midland Centre was held in Birmingham on Thursday, October 14th. The president (Councillor H. Smith) took the chair, and there were also present: Messrs. Albert S. Smith, F. G. Whittall and R. Webb (Birmingham), A. Chambers (Leicester), A. Brazier (Bromsgrove), J. Beckett (Mansfield), H. Holloway (Redditch), W. J. Barton (Nottingham), T. Ham and H. Wil[illegible]k (Wolverhampton), R. Chambers (Walsall), J. H. Walker (Derby), and J. Bott (West Bromwich).

The Secretary reported that the cash in hand on account of the National Reserve Fund, was £26 11s. In order that the Centre might pay an instalment of £100 at the end of the year, he was instructed to make application for unpaid amounts promised towards the fund. The following are extracts from the secretary's quarterly report: "Whilst there seem to be some indications of revival of trade in other industries, reports show that the building trade is still in a depressed condition. No serious difficulties with the operatives had been reported during the quarter. The secretary attended the half-yearly meeting of the National Federation at Portsmouth, and has since forwarded to the local associations copies of the minutes and of the half-yearly report. Great reluctance had been manifested again this year in filling up the annual return of membership, and most of the returns sent in were incomplete. The work of the Centre had gone on quietly during the quarter, and in consequence of the holidays very few meetings had been held. The president, secretary, and Mr. A. W. Chamberlain had attended at Hanley on September 16th, to meet the North Staffordshire builders, but the visit had proved disappointing. The secretary had met the Northampton Association, and had discussed with them the question of forming a local conciliation board."

The report was received and ordered to be entered on the minutes.

The secretary was instructed to call the attention of the local associations to the resolution passed by the National Federation in reference to supplying priced schedules with tenders, and to request them to carry out the recommendations as far as possible.

The secretary was instructed to attend the Conference of Secretaries at Leeds on October 19th.

The secretary was also instructed to apply to the local associations for unpaid subscriptions.

A letter was read from Mr. A. G. White in reference to organisation.

The secretary was instructed to send at the end of the year to the local associations a list showing how the associations had been represented at the Council meetings during the year.

A question was asked as to what was the usual custom as to supplying hot-water services for domestic use, particularly as to whether the work should be done by heating engineers or plumbers.

The general opinion of the Council was that strong objection should be made to any attempts on the part of the operatives in the direction of demarcation of work.—FRED. W. AMPHLET, secretary.

BRISTOL ASSOCIATION.

Secretary: A. J. Pitt.

The ordinary monthly meeting of Bristol Association was held at the offices, Guildhall, Small Street, on September 30, under the presidency of Mr. Frank N. Cowlin. There was a fair attendance of members.

Reference was made to the difficulty experienced by builders, when unsuccessful in tendering for work under the Corporation, in getting information as to the various amounts of tenders in order to see their position in the list, and how far they were out, as no official particulars were issued. It was accordingly decided to ask the president to interview the town clerk with a view to such information being transmitted to unsuccessful tenderers. It was mentioned that the same thing might be said of a large number of cases when tendering for work under architects, and it was suggested that this point might be raised at an interview which it was proposed to endeavour to arrange with the members of the Bristol Society of Architects.

A suggestion was made at a previous meeting that, as certain of the local architects complained that in some instances they were asked to conform with rules, in the framing of which they had had no voice, it might be well to arrange a Conference at a date mutually convenient, at which such matters could be discussed in perhaps a somewhat informal manner, to the possible benefit of all concerned. It had been decided to postpone the consideration of this subject until the autumn, and accordingly it was now brought under the notice of the meeting for discussion. The general consensus of opinion was that such a Conference could not be otherwise than satisfactory, as, although the relationship existing between the Bristol architects and the builders was of a most friendly character, there were many little points which might with advantage be set before such a gathering—such as, for instance, depositing of priced bills of quantities; tendering for time and money; attendance on other trades, etc., etc. Accordingly the secretary was desired to get into communication with the secretary of the Architects' Society with a view to arranging a suitable date for such conference, after which a further meeting could be held to decide definitely as to the points for consideration.

This being the first meeting of the Association since the Federation Conference at Portsmouth, Mr. E. J. Neale briefly referred to the business transacted thereat.

Arising out of the remarks made by Mr. A. G. White, the National Federation secretary, at the annual summer excursion of the Association in July last, the question as to the adoption of the inter-trading rule by the Bristol Association was discussed. The president remarked that the conditions in the West were different from those in the North of England and the Midlands, where each trade was practically a separate industry, and carried on as such, and he thought there would be some difficulty in adapting the rule to local conditions, although, of course, he recognised its value.

Mr. Neale thereupon put before the meeting a specimen telephone card, which he had received from Mr. White, and said that possibly something might be done in the direction of a modified form of inter-trading rule in connection with that publication,

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the members undertaking, wherever possible, to give the preference to those firms who became associate members of the association, and had their names inscribed on the card; this, he explained, would also materially benefit the association funds.

Eventually it was decided that a sub-committee, consisting of the president, Messrs. Chown, Neale, Perkins and Woodward, go carefully into this matter and report to the next meeting of the association.

The sub-committee appointed to go into the matter of the inter-trading rule was asked also to give their attention to ways and means of extending the influence of the official organ of the Federation in the district.

Proposed New Works.

BIRMINGHAM.—A L.G. Board enquiry has been held at the Birmingham Council House, to enquire into the application by the Council for sanction to borrow the sum of £121,217 for the extension of the Birmingham Council House; and also sums amounting to £8,355 for works of sewage and street improvement.

BLACKPOOL.—The Building Plans Committee of the Blackpool Corporation at their usual monthly meeting approved of 22 of 45 plans submitted. The following were included:—Detached dwelling-house, greenhouse and buildings, Peddar's Lane, South Shore, J. W. Cardwell; three houses, Marlborough Road, John Whiteside; two houses, Westfield Road, John Porter; two houses, Whitegate Drive, A. J. Haworth; one house, Moon Street, Wm. Bamber; two houses, off Holmfield Road, and Warbrick Hill Road, Jas. Leach; ten cottages, Onslow Road, G. F. Clarke; house and shop, corner of St. Walburga's Road and Onslow Road, Joseph Wignall; house, Park Road, Misses H. C., E., and M. J. Gourlay; eleven houses, Oxford Avenue, John Gregson; two houses, Palatine Road, Wm. Bailey; four houses, St. Alban's Road, Frank Lumb; elementary school, Queen Victoria Street, Blackpool Education Committee; elementary school, Manchester Road, Blackpool Education Committee; additions to Arnold House School, South Shore, F. T. Pennington; new streets, St. John's Estate, St. John's Estate Company.

BRADFORD.—The proposed extensions to the Royal Eye and Ear Hospital are estimated to involve a sum of £10,000. The additions, which are Gothic in style, have been designed by Messrs. Mawson and Hudson, architects.

CHESTERTON (CAMBS.).—A new elementary school for the parish of Chesterton is proposed to be erected in Richmond Road. It is to accommodate 150 children.

CLYDEBANK.—Mr. Carnegie's offer of £10,000 for the erection of a library has not been received with general favour. At the meeting of the Second Ward ratepayers three representatives declared themselves unfavourable to the project, and this attitude was received, it is stated, with loud applause.

HEXHAM.—At a meeting of the Rector and churchwardens, a letter was read from Mr. Temple Moore, architect, stating that Messrs. Holloway Bros., Ltd., London, were taking immediate steps as might be necessary to prevent any accident due to the alarming condition in the north transept, and that preparations would be made for such scaffolding, shoring, and supporting as might be required.

HULL.—The enlargement of the present, or the provision of a new, Sanatorium, is estimated to cost anything up to £15,000.

LEEDS.—A L.G. Board enquiry has been held, respecting an application by the Leeds Corporation for sanction to borrow a sum of £15,737 for the reconstruction and widening of the bridge carrying the Leeds and Bradford road over the river Aire, near Kirkstall Station. The new bridge will be 50ft. in width, whereas the present one is only 22ft. wide.

LONDON.—Mr. Emslie J. Horniman, M.P., whose father presented Horniman's Museum and ground to London, has promised to give £4 500 for the erection of a lecture hall at that institution, to accommodate about 200 persons. The only conditions attaching to the gift are (1) that the architectural designs shall be subject to Mr. Horniman's approval, and (2) that at least forty-eight lectures are given each year to teachers or children without charge for admission.

NEW MILLS.—About £1,200 has been subscribed towards building a church at Bank End, between Newtown (New Mills) and Furness Vale, on a site given by Colonel Cotton Jodrell, C.B.

NORWICH.—A public meeting has been held here in support of the appeal of the Governors of the Norfolk and Norwich Hospital in aid of the fund which is being raised to defray the cost of the considerable additions which have been found to be necessary for the development of the institution. To provide these will cost about £25,000, and a further like sum is required for endowment purposes. £14,000 has already been subscribed, his Majesty the King, who is patron of the hospital, showing his interest in the scheme by subscribing two hundred and fifty guineas. His Majesty has graciously signified his intention of laying the foundation-stone of the new isolation block for cases of infectious disease amongst the patients, and of a separate building for septic surgical cases—two of the chief requirements—on the occasion of his visit to the city on the 25th inst.

NORTON.—The Town Council, having received a communication from the Board of Education stating that, after careful consideration they had decided that the proposed new school was not necessary, have addressed a letter to the Board, pointing out that the provision of a new school is not of immediate urgency, and expressing an earnest hope that the decision may be reconsidered.

NOTTINGHAM.—A L.G. Board enquiry into the application in regard to the sanction of a loan of £4,300 for the rebuilding of part of the Shire Hall at Nottingham, has been held. It was explained that in March last a fire occurred on the premises occupied by the county departments, several rooms being completely destroyed and others considerably damaged. The Standing Joint Committee came to the decision that it was advisable to erect entirely new property. A scheme was, therefore, prepared, and it has been submitted to the County Council. The proposed new building will consist of a basement, the ground floor, first floor, second floor, and third floor, with a Mansard roof.

ROATH.—A sum of £12,000 is needed for the erection of a parish hall, enlargement of St. Margaret's Church, and the erection of a vicarage, mission-hall, and room near Kimberley Road, Penylan.

SHREWSBURY.—Mr. Edgar Dudley, F.S.I., a Local Government Board inspector, has held an inquiry in regard to the application of the Shrewsbury Corporation for powers to borrow two sums of £8,000 and £8,080 to be expended in the erection of public slaughter-houses, stables, and depot.

WAKEFIELD.—The Education Committee have reported that, owing to the demands of the Board of Education it had become necessary to build a new school. A resolution that a plot of land situated in Lawfield Lane be purchased for the erection of a school to accommodate 900 scholars has been adopted.

WILLESDEN.—The Willesden District Council are negotiating for the purchase of an acre of land at Neasden for the erection of an elementary school, and are compelled to pay £1,500 for a site which is rated at only £2 per annum.

WIMBLEDON.—An agreement has been completed between the Wimbledon Borough Council and the Surrey County Council, for the extension of the Wimbledon Technical Institute.

Notes and News.

The Lord Mayor of London, as chairman, and the Executive Committee of the Shakespeare Memorial National Theatre, have convened a Conference of local authorities at the Mansion House on October 23rd, at 3 o'clock, for the purpose of discussing the scheme. The speakers will include Mr. Birrell, Lord Lytton, Miss Ellen Terry, Sir John Hare, and Mr. G. Bernard Shaw.

* * *

Messrs. Ed. Wimperis and Best, architects, 61, South Molton Street, W., announce that owing to the necessity for larger and more convenient offices, their address has been changed as given above. Their telephone number and telegraphic address remain unchanged—telephone. 6892 Gerrard; telegraphic address, Wimpelstok, London.

* * *

Messrs. L. and C. Hardtmuth have decided to erect a building, worthy of the magnitude of their business, in Kingsway. This fine erection will be commenced shortly from the designs of Mr. J. S. Gibson, of 5, Old Bond Street, the builder being Mr. Jas. Carmichael, of Wandsworth, Messrs. L. and C. Hardtmuth being the manufacturers of the well-known Koh-i-Noor pencils, as well as the sole European representatives for Waterman's Ideal fountain pens. The building will bear the title of "Koh-i-Noor House."

* * *

The Columbian Fireproofing Co., Ltd., have secured a £14,000 contract for nearly five miles of high-pressure water-pipes, 24ins. diameter, on the "Bonna" system of reinforced concrete, for the Corporation of Swansea, under the the general contractors, Messrs. J. Aird and Son. In addition to the above, the Columbian Fireproofing Co., Ltd., are constructing the "Bonna" pipes, 18ins. diameter, for the Clydebank water trustees (£19,000), also for the Belfast Corporation, 21ins. diameter (£1,700).

* * *

The net profits of the Bath Stone Firms for the six months ended June 30th were £5,003, and £7,045 was brought forward. An interim dividend at the rate of 5 per cent. per annum has been declared, leaving to carry forward £6,371.

* * *

The Agent-General in London for Queensland has just received the annual report of the Forestry Department in that colony. The total forest area in Queensland is 40,000,000 acres. The whole forest area of Australia is 97,003,000 acres. Special areas of timber amounting to close on 4,000,000 acres are reserved by the Government. The export of timber from Queensland for 1908 was 800,000 super feet, the greater part of this was undressed timber. Japan took about half of this quantity, and the United Kingdom and Germany came next as buyers. The saw milling industry is active in Queensland; 65,000,000ft. of soft woods, and 35,000,000ft, of hardwood were cut in 1908. The value at the mill per 100 super feet is: soft woods 12s. 6d., hardwood 13s. 10d., and cedar 33s. 4d.

* * *

The construction of the new Campanile at Venice is proceeding apace, and 1911 should see its completion. It has been fortunate in being relieved of all pecuniary embarrassments, and the original estimate of £72,000, and the later calculation of £80,000, have already been supplied, together with a comfortable surplus for emergencies. The new Campanile will resemble the old in appearance, though iron clamps and girders will, in reality, make it entirely safe. The only proposed alteration is the removal of a pillar which stood in the centre of the tower, in favour of a passenger lift. For the most part, too, old associations are being preserved, the stone being quarried in Istria, the cement coming from Montferrat, the sand from Brenta—places all famous in Venetian history.

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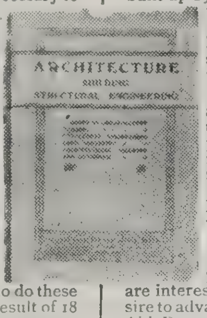

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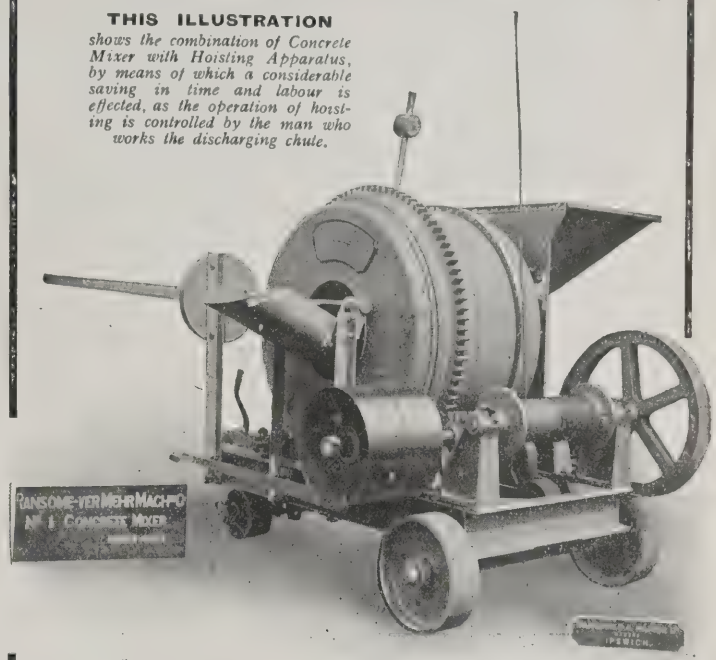

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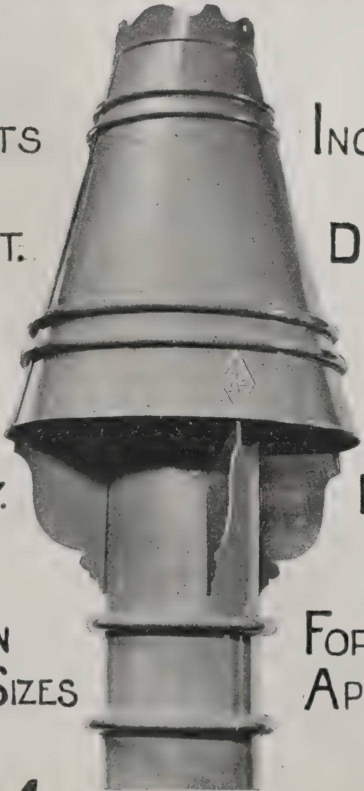

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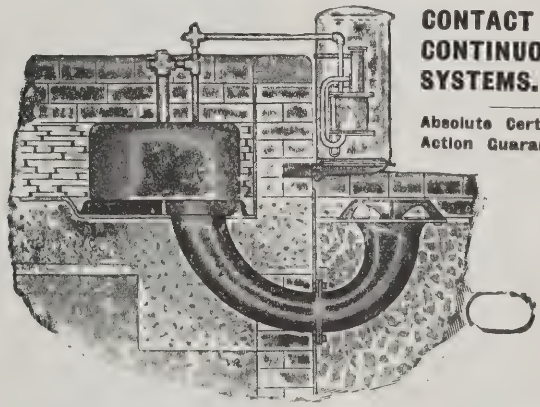

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Armthorpe (Doncaster).—For extension of Armthorpe National Schools. Mr. John Simmons, Architect, Doncaster.

	£	s.	d.
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C. Sprakes and Sons	677	10	0
B. Wortley	666	14	0
Mullins and Richardson	622	11	0
D. Gill and Son,*	617	0	0

All of Doncaster.

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T. Kenny, Ipswich	11,[illegible]10
Spencer Santo and Co., London	11,209
E. Farr, Frinton	11,143
T. Parkington and Son,* Ipswich	11,120

Rest of Colchester.

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W. Anelay	998
Mullins and Richardson	992
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Somervail and Co., Dalmuir, near Glasgow	1,037	4	11
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T. Russell, Dundee	949	0	0
A. Findlay and Co., Ltd., Motherwell, Lanarkshire	941	4	9
Redpath, Brown and Co., Ltd. Edinburgh	898	16	2
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Rest of Glasgow.

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London, S.E.—For alterations and additions at the police station at Kennington Road, S.E. Mr. J. Dixon Butler, F.R.I.B.A., Surveyor to the Metropolitan Force, Architect, New Scotland Yard. Quantities by Messrs. Thurgood, Son, and Chidgey, 8, Adelphi Terrace, Strand, W.C.

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(Tenders continued on page viii.)

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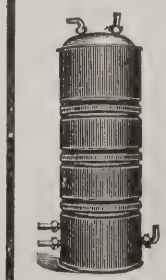

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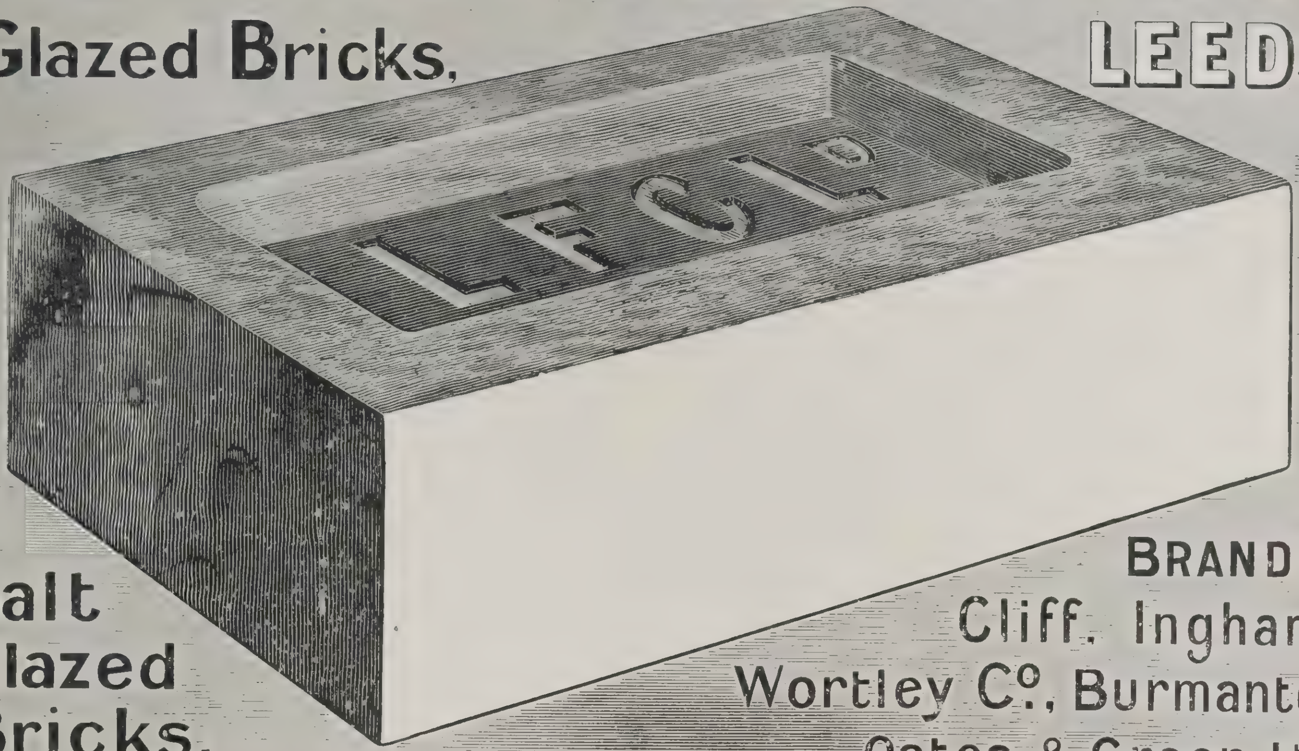

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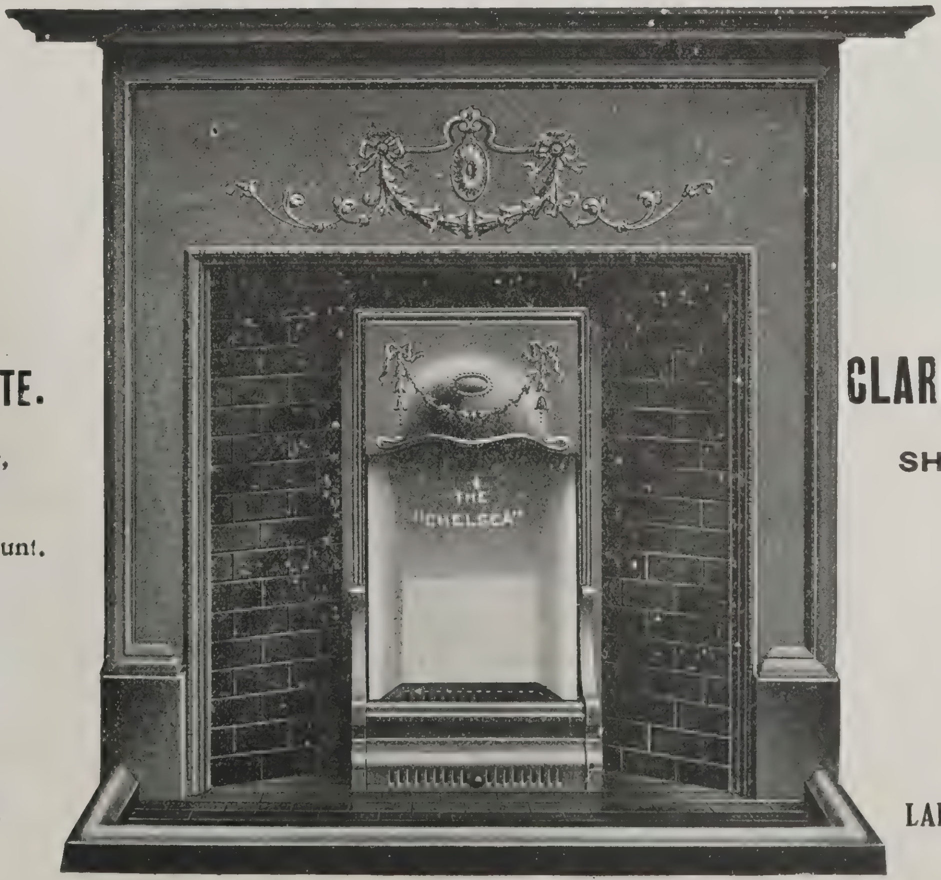

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(Tenders continued from page vi.)

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Mullins and Richardson*	... 667	10	6

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Ashby Bros., London	9,390
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Holland and Hannen,* London ...	9,292
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†Subject to extension of time clause.

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Holloway Bros., Lambeth	4,900
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J. and C. Bowyer, Ltd., Upper Norwood	4,835
Leslie and Co., Ltd., Kensington ...	4,782
G. Munday and Sons, Trinity Square, E.C.	4,759
Kirk and Randall,* Woolwich	4,747
H. L. Holloway, Deptford (withdrawn)	4,327

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Leslie and Co., Ltd. ...	... 43	7	8
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J. and C. Bowyer, Ltd. ...	... 38	14	9
Kirk and Randall*	... 33	16	11
H. L. Holloway	.30	17	3
J. Mowlem and Co., Ltd.	... 24	0	7
Thomas and Edge ...	... 13	8	4

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Nantwich.—For erection of new shops, Nantwich, for Messrs. Chesters Bros. Messrs. Bower and Edleston, A.R.I.B.A., Architects.

G. Dodd and Son, Whitchurch	£4,150	0	0
S. Manley, Aston	3,225	0	0
J. Harding	3,155	0	0
F. Matthews	2,987	10	0
Cox and Vaughan	2,640	0	0
C. Gresty, Willaston ...	2,538	8	0

Rest of Nantwich.

Owston Ferry, near Doncaster.—For erection of pumping station and works in connection therewith adjoining the River Trent, at Owston Ferry, for the Haxey and Owston Drainage Board. Mr. John Simmons, M.I.C.E., Engineer, Bank Chambers, Doncaster.

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B. Pumfrey, Gainsborough ...	2,200	0	0
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Upwey (Dorset).—For alterations, additions, and repairs to Upwey Manor House, Dorsetshire, for Mr. R. Kersley. Mr. R. E. Brinkworth, F.S.I., Architect, 16, Old Bond Street, Bath.

Jenkins and Sons, Bournemouth	£2,077	0	0
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Erwood and Morris, Bath ...	1,802	0	0
T. Conway, Ltd.,* Weymouth	1,735	13	6

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Thompson	21,333
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Wilson and Son	20,105
Bowen and Son	19,893
Whitehouse and Son	19,647
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Brightside Foundry Co. ...	... 1,120
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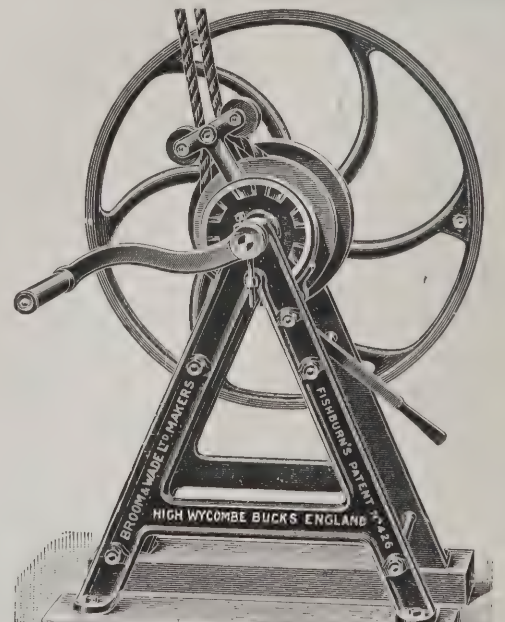

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New Zealand Architecture.

The competent British architect is looking towards New Zealand with mingled hope and despair. It should afford him a fine field for the realisation of his ideals, artistic and financial. But the question is, Would it? Lord Plunkett has said that New Zealand architecture is contemptible. Mr. P. A. Vaile, writing in a London evening newspaper, says of this utterance that "it sounds nasty, but it's true." He indicates how this vileness arises. The Council decided to have one side of Auckland Town Hall ("locally called the Flat Iron") in Oamaru stone (creamy white), and the other in red brick and cement; and you could see both sides at once! Mr. Vaile had a model made to scale and painted to colour, "and now both sides are being made of Oamaru stone!" The admiration mark is Mr. Vaile's, but its precise significance is not clear to us. We are unable to determine whether it may be taken as expressing surprise at the preference for creamy white, or whether, on the other hand, it indicates admiration for his own powers in converting the heathen from their parlous proclivity for piebald perspectives. Evidently their case is not hopeless; for although they are spending £100,000 on this remarkable building, they do not insist on having it variegated in conformity with their luxuriantly exotic tastes. Mr. Vaile hopes that his observations may lead English architects "to watch Colonial competitions, to see how much their work is inspiring Colonial architects, and perhaps to compete themselves." Who will be the pioneer in this missionary work? It would be no mean thing to go down to posterity as the proto-martyr of the architectural conversion of New Zealand.

Labour Exchanges.

An interesting development of the labour exchanges problem is taking place in Germany. The decision of the Rhenish-Westphalian Collieries Union to establish a centralised system of labour exchanges has called forth a strong protest from the trade unions. The objection seems to be based on the fear that centralisation will give employers too complete a control of the stream of labour. This point is worth noticing, because in this country the positions seem to be reversed. The movement in favour of labour exchanges seems to have sprung from the workers, and to be regarded with a certain amount of suspicion by employers. For ourselves, we have from the outset believed that labour exchanges may be and should be of equal advantage to both parties; but we realise that it may possibly be difficult to hold the balance level. Builders, as representing our greatest constructive industry, will certainly watch the movement with the keenest interest, and employers may be trusted to see that it is not wrested to their own disadvantage.

The Selection of "Shocking Examples."

We seem, as a nation, to be getting supersensitive to criticism. A lecturer on architecture who had ventured to treat of "Chorley—Ugly and Beautiful," was surprised to find that his observations "had been received not altogether with favour," and he took the first opportunity of explaining that what he meant to convey was "that Chorley, like many other towns, was very ugly when compared to the beautiful cities of ancient Greece and Rome." We trust that this explanation has been found satisfactory, but should be rather surprised to find that the champions of Chorley are pacified. Have comparisons ceased to be odious? If a man told his wife that she was very ugly, would it be as balm to her wounded vanity to explain that he only meant very ugly as compared with the Venus of Milo? We wish that the lecturer had stuck to his guns, and had endeavoured to strengthen his accusation instead of refining upon it with a sort of half-hearted apology. The incident shows that there is much virtue in the proverb, "The truth always offends." A great deal depends, however, on the method of statement. To any lecturer on architecture who is desirous of speaking the truth in love, we would respectfully commend the delightfully delicate method of Lord Byron in dealing with his publishers. He wished to lodge a complaint with Saunders and Otley; so, "Look here," said he, "I don't wish to be discourteous; but if you are Saunders, confound Otley; if you are Otley, why, confound Saunders." The architectural critic would be on much safer ground. If he wanted to condemn the buildings of A, he should go to the neighbouring township of B to do it, and vice-versa. Then both would be highly delighted, because each likes to be told of the other's faults; and the object in view—that of indicating what is architecturally ugly, and why—would be quite as effectually achieved by this indirect method of approach. We certainly think that this point is worth the attention we are bestowing upon it. We want to make a clean sweep of architectural ugliness; but we realise that while it is tremendously difficult to convince a man of his own sins, it is comparatively easy to make him see the exceeding sinfulness of sin in others.

An International Exchange.

The advantages of organisation have not been exhaustively ascertained. Some of them are very obvious, others need expounding, and yet others reveal themselves somewhat unexpectedly. In this last class may be surely included a development recorded in last week's issue by Mr. A. G. White, the secretary of the National Federation of Building Trades Employers. The Special School for Public Works and the Building Trade, Paris, wanted to obtain for one of its students facilities for gaining experience of practical work in England. Mr. White saw that the idea was good, and was able to make excellent arrangements for carrying it out. Moreover, two of the Belgian master builders who recently visited this country approached Mr. White with a similar object. It then became apparent that if our French and Belgian friends thought English experience desirable, there is no good reason why we should not return the implied compliment. We naturally feel flattered to find that French and Belgian builders think that our methods as well as our language are worth careful study; and our insular conceit is by no means so colossal as to lead us to suppose that we have nothing to learn from the Continent. Mr. White at once saw the possibilities of interchange, and he has ascertained that this view is agreeable to our Continental friends. In Bunyan's phrase, we "wonder whereto this thing may grow." If the notion catches on, its extension beyond the bounds of the building industry is certain. Travelling studentships for young architects and young decorators are already established, and the value of the experience that is thus to be gained is indisputable. The somewhat similar movement which Mr. White has set on foot should be hardly less valuable. It should give the young builders of each nation a broader outlook as to men, methods, and materials. It is very certain, indeed, that the various nations have still much to learn from each other, and Mr. White has indicated one very practicable way in which valuable experience may be interchanged, and more cordial international relationships encouraged. The essential unity of the building industry, about which we had a good deal to say a few weeks ago, seems, in the light of Mr. White's announcement, to have assumed at least a tinge of international significance!

Sooty Cities. An intensification of the colour sense is a very natural concomitant of the growing revival of taste. It is therefore becoming a habit to talk of the colour of cities. Books are being published under such titles as "The Colour of London," "The Colour of Paris," and so forth; and we now see that Professor Adshead, of the University of Liverpool School of Civic Design, has been making observations on the colour of cities. He is reported as saying, "A city which is white, and which scintillates and reflects the blue of the sky and the light of the sun, is the only fit background for the brilliant crowd with which every progressive city from Athens to New York has stood possessed. The city which is white has the greatest refinement and charm. Cities which are grey, like Edinburgh, suggest endurance, grandness, and romance. All great cities are either white or grey." This, it has been said locally, is rather a serious aspersion on Liverpool, which, it has been promptly pointed out, is neither grey nor white; for "Liverpool, except at the Pier Head, is certainly a city of soot." We are glad that we were not the first to hiss out those alliterative sibillants. Those who live in sooty cities should not blacken buildings that are elsewhere; and we in London have no redeeming Pier Head, and now, alas! no admonitory Adshead; unless, indeed, we may be allowed to claim that the learned and genial professor belongs as much to London as to Liverpool, and more to architecture than to either. Even our White City is rapidly assuming all the tints of autumn, and is therefore, like Liverpool, and perhaps London, outside Professor Adshead's category, and so are the "brownstone" cities of the United States; while, if whiteness or greyness are essential to real greatness, we fancy that there are some Continental and Eastern cities that could hardly qualify; to say nothing of the cities of New Zealand, where, as mentioned in a previous note, there is an apparent "letch" for buildings that are parti-coloured. But if, as the German proverb has it, "by night all cats are grey," so, perhaps, are all cities; suggesting, therefore, when the lights are out, "endurance, grandness, and romance."

DESIGN IN REINFORCED CONCRETE.

Design in armoured concrete, as in steel construction, naturally resolves itself into two parts. On the one hand the estimation of the possibilities of loading on the structure and the bending moments and thrusts and tensions produced thereby—the external forces, as they are called; and on the other hand the design of the various beams, columns, struts, and ties of such a strength as to enable them to resist the external forces with a certain margin of safety. The first half of the problem is almost the same as for construction in steel, and the necessary knowledge for its solution should already be part of the mental equipment of every engineer, though it is now complicated considerably by the monolithic nature of the finished structure. For, says a writer in "The Times," whether for the purposes of design it is so considered or not, an armoured concrete structure is—unless deliberately sectioned into parts—essentially monlithic, and beams and floors passing over several supports are necessarily continuous girders and must be so considered if satisfactory results are to be obtained.

Unfortunately, the analyses of the moments for beams involving the property of continuity is by no means such a simple business as for beams of a single span, for not only does the maximum bending moment differ considerably in contiguous spans and vary again from the bending moment over the supports, which is usually so much greater as to necessitate the depth of the beam being increased slightly at this point to prevent the concrete from being unduly stressed, but all these figures change again with the number and relative length of the spans. The contingency whereby some of the spans might be loaded while others are left vacant must also be duly considered, and the possible negative moment produced thereby must be guarded against.

Once the external forces have been properly determined, and this can only be done by engineers possessing both practical and mathematical knowledge, the procedure for the design of the beams and columns to resist these forces is fairly simple and perfectly definite and accurate. There is no need at all for the approximate methods of calculation occasionally advocated, which nearly always involve a disquietingly indefinite amount of inaccuracy. The recognised rational formulæ are not unhandy in the working, though perhaps rather terrifying at first sight, whilst the graphical methods are still more accurate and expeditious in use. As soon as the depth of the beams and the size of the columns have been decided, either by the untrammelled considerations of economy or the practical and æsthetic exigencies of architecture, a certain series of points has to be considered. First the necessary areas of metal in tension and concrete in compression must be calculated so that the stresses in these materials do not exceed a selected limit. Since the bending moment is constantly varying in sign and amount from one span over the support to the next, the points at which some of the armouring may be stopped off or at which armouring in the top of the beam over the supports must be introduced must also be inquired into.

The armouring against the shearing forces may be done either by bending up some of the tension bars, by the introduction of stirrups, or by a combination of both methods. In any case the area of metal to resist shear must be carefully calculated, and the stress must not be permitted to exceed the proper limit.

The armouring in a beam should, as it were, reflect the variations of the bending moment and shearing forces. How accurately it must do so, and to what extent it may be advisable to put in an excess of material at certain points, are considerations which the practical difficulties of construction will often determine, but the armouring must never be less than the calculated amount, or the factor of safety is encroached upon and a weak spot is introduced into the structure, which, like the hawser joined with twine, renders the excess of strength of the former at once useless and wasteful. It is this point which is ignored by those who under a plea of greater simplicity—usually to be construed as less expensive work in the drawing office—advocate design by fixed rules and average bending moments. Any averaging of the bending moments must necessarily give too much armouring at some points, which is extravagant, and not enough at others, which makes the other excesses all the more unnecessary. The factor of safety also then becomes a factor of ignorance or parsimony, and must be taken higher in proportion. This does not tend towards economy.

What is really essential for the design of reinforced concrete is a sound engineering instinct, a good mathematical training, and, for the practical side of the question, a large experience in the use of this material.

NOTABLE BUILDINGS OF CHELTENHAM AND DISTRICT.*

By F. Dare Clapham, F.R.I.B.A.

The Romans existed in these parts for a period of 400 years, and, as showing the extent to which they populated this neighbourhood, out of just over 300 parishes in Gloucestershire, Roman remains have been found in about a third.

"The" Garden City.

After giving a succinct history of Cheltenham and district from A.D. 43 downwards, Mr. Clapham noted that Cheltenham has been termed the Garden City, and that it certainly abounds in gardens, both public and private. It is beautifully situated in the valley of the Severn at the foot of the Cotswolds, which bound the valley on the east side, while on the west are the Malvern and Forest of Dean Hills. From these hills come numerous springs, forming brooks, which run through the villages of the district and make them so picturesque. At Seven Kings, about four miles from Cheltenham, the River Thames has one of its sources.

The Cotswold district was for centuries celebrated as the centre of the sheep-farming industry, and even 800 years ago wool from this district was exported to Flanders and elsewhere, and, judging from the size of the farms and the outbuildings generally, the farmers three or four centuries ago must have been very prosperous.

Domestic Architecture.

The domestic architecture is probably as interesting and characteristic as that of any other part of the country. Its chief charms are its great simplicity and splendid proportion. The character of the work is generally the same, owing to the natural use of local materials, built according to local traditions, and influenced by surrounding conditions.

The houses were generally built in some sheltered position, often on sloping sites, but beyond this precaution very little attention seems to have been paid either to aspect or situation. The whole district being a stone one, all buildings were constructed in limestone, usually quarried from the immediate neighbourhood. The stone weathers well, and when first quarried is distinctly yellow, but it soon tones down, and takes on after exposure all kinds of beautiful greys and yellows.

In the better class of work the exterior walling was executed in ashlar, carefully dressed, with upright joints, and laid square on bed.

The plans of the houses were very simple, and the stone outer walls were 2ft. to 2ft. 6ins. thick, the internal divisions being simply lath and plaster or oak panelling. In order that they might be roofed in one span, the plan was usually one room deep, the rooms being 16ft. to 20ft. wide.

The roofs were of a steep pitch, and covered with stone slates, laid in diminishing courses, and the roof space was used for bedrooms and lighted by windows in the gable ends or by dormers

Very often the wall plate was placed in the centre of the wall, and the stone slates at the eaves were bedded on the wall with only a slight projection, which gave a considerable tilt to the eaves.

There were no gutters, and at the intersections of the roofs the stone slates, which were laid without any torching, were brought round in a sweep, a method known locally as "galetting," and the ridge piece, too, was sawn out of a block of stone.

In many cases the copings to the gables are only a few inches higher than the stone slating behind, and in the smaller houses the slates simply project a little in advance of the wall face.

The chimneys were usually carried up centrally over the ridge, the flues being built separately, either square or diagonally in groups of three or four; they were formed of thin sawn blocks of stone, and finished with a moulded cornice and a weather mould at the base as a protection to the roof.

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*Substance of a paper read to the Architectural Association on Friday, October 22nd.

The finials on the top of the gables and over the springing stones are of great variety, and were often pierced on all four sides.

The windows have stone mullions with square heads and a label mould over. These labels were very often carried round the house as a string course, and in several houses there is a set-off at each string course. The lights were narrow and squat, and usually decreased in number on each succeeding storey. There was generally a thicker central mullion where the lights exceeded three in number.

The lead glazing of the windows was ornamental, and the opening casements were fitted with wrought-iron fastenings, very often beautiful in design, and showing what excellent work used to be executed by the local smiths.

There was no external porch, and where one does occur it has usually been added at some later date. The doorways were simple, the doorhead being, as a rule, four-centred and out of one stone, and internally there was no arch, but always a flat lintel. All the original doors were plain, and, like the windows, the wrought-ironwork was always good in design. A predominating feature of the interiors of the houses was the large open fireplace, very often of great width compared with the size of the rooms.

The staircase was placed in the centre of the house, and in many cases had a solid newel about 5ins. square, with solid oak treads, and when the house was built on a sloping site the different levels were very cleverly arranged. Most of the work in the district was executed between the end of the sixteenth and the close of the eighteenth century.

I do not propose to take each place in the order in which we saw them, but in the order in which they are situated on the chief roads out of Cheltenham.

Postlip Hall.

About five miles to the north east of Cheltenham is Postlip Hall, picturesquely situated on the slope of the hills and overlooking a valley on the south. Originally the house consisted of three distinct blocks of buildings, the eastern part being a farmhouse, with a dwelling-house on the west, and two cottages to the north. Not much is known of its early history, but at the beginning of the seventeenth century the house was rebuilt by a certain Giles Broadway, or Giles of Broadway. The main elevation which faces south has a frontage of 94ft., broken by three bays and roofed with a range of sharply-pitched gables, six in all, the one on the east being wider than the others, and evidently the older part of the house. The return elevation on the east has a series of small simple dormers along the whole length of the roof. In the centre of the house is a picturesque courtyard, containing a circular fountain, which gives it quite a continental appearance. Internally there are some fine rooms, richly panelled, and some good chimneypieces.

The best room is the drawing-room on the first floor, which has some good panelling that has not been tampered with, and an elaborate stone chimneypiece with some curious emblematical figures in the upper part, one representing apparently Temperance triumphant over Intemperance.

The chimneypieces in the dining-room and hall are richly carved in wood, but appear to have been made up to a certain extent. The one in the dining-room is dated 1614, and bears the initials of the original owner and his wife. The staircase, like others in the district, winds round a square newel wall, and has solid oak treads, with a nosing worked on.

A Norman Chapel.

On the slope of the hill behind the house on the north side is a small Norman chapel dedicated to St. James. Its origin is interesting, for it appears that the tenants of Postlip, in the early part of the twelfth century, petitioned the Lord of the Manor, William de Solers, to build them a chapel in their immediate neighbourhood, as, owing to the unsettled state of the country during the Civil Wars, they were afraid to attend their parish church. At the time of the Reformation it was despoiled and allowed to fall into decay, and until twenty years ago was used as a barn. It was restored in 1891, and is now used as a private chapel. It is an interesting Norman building, with a doorway on the south side. Perpendicular windows have been inserted in the west and east ends, but the original Norman windows still remain on the north and south sides, mere narrow slits in the walls with a deep splay inside. Over the chancel wall is a simple stone bell turret, and another interesting feature is a small opening high up in the nave wall on the south sire with an external corbel; this was probably intended to hold what is known as the "Poor Soul light," which was a lamp lighted nightly to remind those who passed by and saw it to pray for the souls of the departed.

M. RODIN AND HIS LATEST WORK. *Photo: Topical.*

The new Monument to Victor Hugo in the Garden of the Palais Royal. The Sculptor, M. Rodin, is standing beside it.

At the foot of the hill to the south-west of the house is an old barn, cruciform on plan, about 96ft. long and 28ft. wide, and the manor house, chapel, and farm buildings form a very picturesque group amidst the surrounding trees.

A few miles further along this road is Winchcombe, an ancient town, called in Anglo-Saxon times "Wincelcombe," which means "a corner of the valley," a very appropriate name, as it lies at the end of a beautiful valley, almost entirely encircled by the Cotswolds.

Winchcombe Abbey.

In the ninth century Winchcombe was the capital of Mercia, and a royal residence, but its importance was chiefly due to the fame of its Abbey. King Offa built a nunnery there in 787, and towards the end of the same century his son Cenulph founded a Benedictine Abbey on the same site for 300 monks, and dedicated it to the Blessed Virgin Mary. At his death he was succeeded by his young son Kenelm, aged seven, who was murdered by order of his sister. Tradition says that the fate of the young King was miraculously revealed in various ways. At any rate, when his body was discovered it was removed to Winchcombe, and the Abbey in consequence became popular as a place of pilgrimage, as the relics were credited with working miracles. A famous historian of the period, William of Malmesbury, says "that there was hardly any place in England more venerated." The Abbey was partly destroyed by the Danes, and it is believed to have passed into the hands of secular priests, but towards the end of the tenth century it was rebuilt and given back to the Benedictines. Up to the reign of King Canute the town had been a county in itself, but it was then united with Gloucester. The town was made a borough in the reign of Edward the Confessor, and the Doomsday Book records that the possessions of the Abbey were unusually large, no fewer than nineteen manors being attached to it. The Abbey was destroyed by fire in 1151, and rebuilt again in 1239. That it was considered of great importance is confirmed by two facts—first, it was a mitred Abbey, and its abbot sat in the House of Lords, and secondly, Edward III. granted it permission to fortify its buildings, a rare privilege and one seldom granted.

On the dissolution of the monasteries the inhabitants who possessed a parish church did not trouble about the Abbey, which gradually fell into decay and disappeared, and now all traces of it above ground are lost. In the fifteenth and sixteenth centuries the prosperity of the town was evidently on the decline, for Edward IV., and later on Elizabeth, granted it charters for holding fairs in order to relieve the poverty of the inhabitants.

The parish church was built by Abbot William in 1490. It is a fine example of Perpendicular work, and consists of a western tower, nave, aisles, and chancel. There is no chancel arch, but the divisions between the nave and the chancel is marked by screens, and in addition across the nave an upper screen or roof truss. There is a lofty clerestory which makes the church remarkably well lighted. There is a curious Jacobean front, dated 1634, and some elaborate sedilia on the south side of the chancel. In the eighteenth century the altar stood centrally, surrounded on four sides by rails, with seats for communicants on the south, east, and north sides, an arrangement which also existed at the neighbouring church of Deerhurst. The church contains some good furniture, and some fine silver plate. Externally, the chief feature is the western tower, with a good weathercock, said to have been brought from St. Mary's, Redcliffe, Bristol. The church is also notable for the great grotesque gargoyles, some forty in number, on the parapets and tower.

Seventeenth Century Houses.

There are several good seventeenth century houses in the town, the best being a picturesque gabled building known as the "Jacobean House," which stands opposite the church, the detail of the entrance front being particularly good. According to an inscription in Sudeley Church, this house was restored and enlarged by Mr. Wyatt in 1879, who had also restored the church some few years before.

Other interesting houses are the George Inn, which was the resort of the old pilgrims, and is inscribed with the initials, "R.K." Robert Kidderminster, an abbot of the time of Henry VII., and another inn in the main street called "The Corner Cupboard," a long, low, rambling place on the street approached by a flight of stone steps, semi-circular on plan There is also a simple Georgian house with interesting detail.

Sudeley Castle.

About one mile from Winchcombe is Sudeley Castle; the property belonged in the olden times to King Ethelred, and was granted by him to his youngest daughter, the Countess of Goda. In those days its value must have been great, for it included a forest of oaks, covering an area of about 6sq. miles. In the French wars during the reigns of Henry V. and VI. a certain Ralph Boteler took an active part and rebuilt the castle from booty gained in the war; he it was who helped to build the parish church in Winchcombe.

In the time of the Civil Wars Sudeley was looked upon as the strongest fortress in the neighbourhood, ranking with Berkeley and Warwick, and as the royal forces occupied Oxford, it became of great importance, for it could command all the district between Camden and Cirencester, but it was captured by Colonel Massey in 1643, and given up to the Royalists later on at the fall of Cirencester. It again surrendered to Sir William Waller, who trained his guns on the castle from Dunn's Hill on the east, and the Parliamentary forces, although only 300 yards off, are supposed to have only hit the castle once. Later on Lord Chandos seceded to the Parliament, and the Commonwealth ordered it to be rendered unfit for a military post, and it was accordingly demolished after being garrisoned for five years. From this time nothing much is known of the castle, and at one time it became a public-house. In the early part of the nineteenth century the estate was purchased by John and William Dent, of Worcester, and they set to work to make the castle fit for a country residence.

There are some interesting pieces of furniture in the house, among them the bed of Amy Robsart, from Cumnor Castle—it is peculiar as having a secret panel in the head containing a crucifix—and in another room there is the bedstead and tapestry from Marie Antoinette's bedroom, removed here when sold at the Revolution, and there is also some good Spanish leather in the dining-room, and generally the house is full of interest.

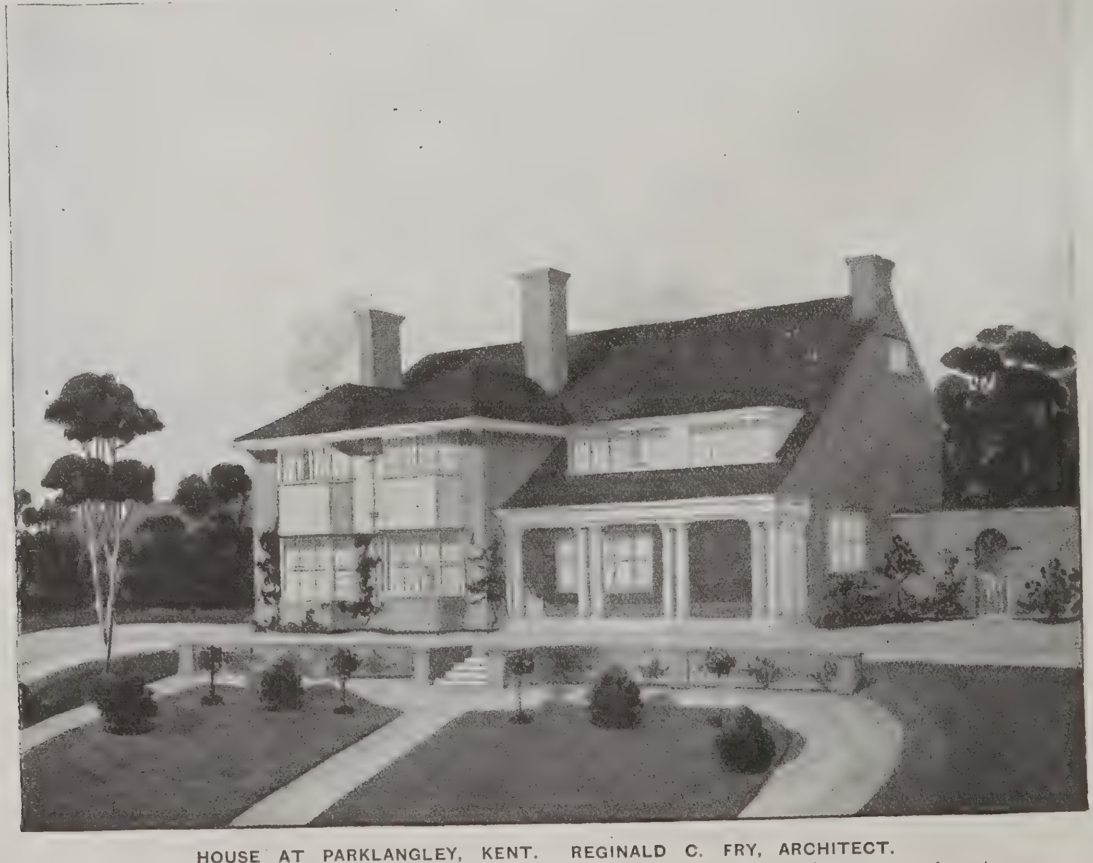
Sudeley must have been one of the finest baronial castles in this part of Gloucestershire. The original house was built in the reign of King Stephen, and rebuilt entirely in Henry VI.'s reign by the famous sea captain, Ralph, Lord Boteler of Sudeley. The ruins of the banqueting hall remain to show what a fine room it must have been, being on the first floor, and approached by a stone newel staircase. The windows at the ends and sides of the hall still remain, and the whole forms a splendid example of late Perpendicular work. The northern quadrangle has been restored by the Dent family, and at the same time the church, which dated from the middle of the fifteenth century, and adjoins the house on the east side, was also restored by Sir Gilbert Scott; it had been very much damaged by the Parliamentary forces in 1643, and had remained in a very neglected state. He also designed the tomb with the recumbent figure which is placed over the remains of Katherine Parr, and contains fragments of the old tomb with the lead coffin inside.

Charlton Abbots.

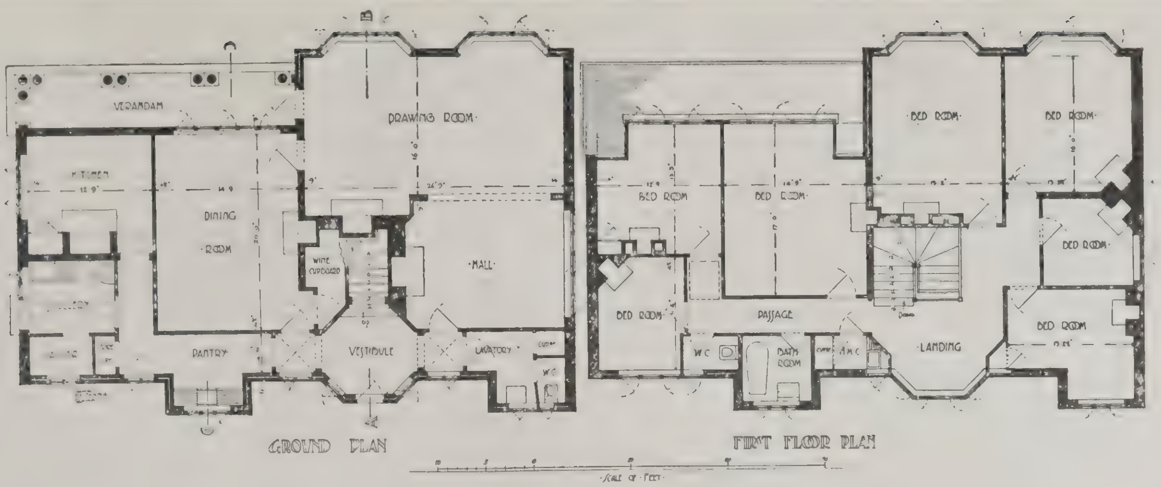
Two miles south of Sudeley Castle is Charlton Abbots, a fine Cotswold building with some later additions, and grouped round the house are the old farm buildings, including a large barn, the whole forming a very picturesque group on the slight slope of a hill. The house has three stories, and is roofed in a single span running east and west; there are three gables on the south side, and two on the north, the projecting portion on this side being evidently an addition—on the eastern side of the building is a two-storied square bay with the centre light 6ins. wider than the others. The most interesting feature internally is the staircase, 5ft. 6ins. wide, carried round a square newel wall of the same dimensions, and off each landing doors lead to the different rooms, the various levels of the different floors making the external elevations particularly interesting. In one of the first floor rooms, which is panelled and has a segmental ceiling, there is a seventeenth century carved oak chimneypiece, and in all probability the house was originally far richer in panelling than it is at the present day, as it has now been converted into a farmhouse. Near the house is a small church, and it is said that there used to exist in the village a lazar house belonging to the Abbey of Winchcombe, but at the present day no trace of it exists.

Sevenhampton Manorhouse and Church.

Leaving Charlton Abbots and going south another mile along the road is Sevenhampton, or, as it is often called locally, Sennington, which has a manor house with a church adjoining. The latter is a small cruciform building, with a central tower, transepts, and no aisles; the curious feature of the tower is that it is narrower than the nave, and is placed east of the crossing, so that the western piers stand free. These piers have been strengthened by flying buttresses placed diagonally inside the church from the piers of the tower to the corresponding angles of the nave and transepts. The tower, which is



HOUSE AT PARKLANGLEY, KENT. REGINALD C. FRY, ARCHITECT.
The walls are of grey plum-coloured bricks, while the upper portion and twin bays are rough-cast



HOUSE AT PARKLANGLEY, KENT. REGINALD C. FRY, ARCHITECT.

These plans are of the house shown on the opposite page.

lighted by windows above the roofs of the transepts, has a turret staircase on the south-east angle. The porch, which is on the south side, has a good door with a four-centred arch and pierced tracery head.

The dimensions of the church are interesting. The nave is only 13ft. 9ins. wide, and the total length of the church is 84ft. The internal dimensions of the tower are 10ft. by 9ft. 6ins. The greater part of the church is fifteenth century work, but the chancel is earlier, and has single lancet windows on the north and south sides; probably the south porch and the tower were built at the close of the fifteenth century. The east window is a three-light Perpendicular one, and probably replaced an earlier one of the thirteenth century. Between the north transept and the chancel is a passage which may also have served as a hagioscope, and the stone forming the roof of this passage is believed to have been an old altar stone, as there are traces of crosses on it. In the chancel also there is an old stone shelf which shows the height of the original altar; it is interesting, as it was not used to raise the altar above the floor level in the early days of the church.

The manor house, which is to the north-west of the church, is a seventeenth century building, but it has been very much modernised, both internally and externally, and the only old part is the back or eastern side. One of the windows in a room on the attic floor has a stone sill, with a stoop for holy water, and, as in earlier days the house was used as a retreat by the nuns from Sudeley Castle, the room may have been used as a chapel. An interesting feature of the out-buildings is the small four-gabled dovecote over the stables.

Whittington.

Another short walk will bring you to Whittington, which is only about five miles east of Cheltenham on the Oxford Road. The village is particularly picturesque, for most of the cottages have very small bay windows. The manor house is a typical specimen of the local architecture, but unfortunately the west wing has been pulled down and replaced by modern additions; the north or main elevation has three-pointed gables with windows, which still retain their original glazing. Like other houses in the neighbourhood, the most interesting feature internally is the open newel staircase, 5ft. 9ins. wide, which goes from basement to attic in a series of flights of seven steps each; at the top of the first flight is a quaint and original dog-gate—the whole staircase shows a prodigal use of timber, for the newels are 7½ins. square, and are continuous, but the turned posts on the top of each newel supporting the one above have been removed, the reason being, so it is said that sacks of corn might be the more easily carried up and down; the solid strings are 14ins. by 7½ins., and the hand-rails 6ins. by 6½ins., with 3½ins. turned balusters. The eastern end of the ground floor originally formed one room. The house contains some good stone chimneypieces, and several of the rooms are panelled. A corner lobby or tambour in one of the bedrooms has an angle pilaster with an Ionic capping treated in a noble but curious manner, for in order to solve the difficulty of the angle volute it is omitted altogether. Close to the house on the east side is the church, so close that at the north-west corner it is only 3ft. off. It is a picturesque though diminutive building, with several traces of Norman work, notably the north doorway, which is now blocked up. It consists of a nave and chancel 12ft. wide, with a south aisle, and a further aisle or chapel on the same side as wide as the nave and separated from it by an arcade. A timber bell turret, with a shingled roof, is placed over the junction of the nave and chancel roofs. In the south aisle are placed three recumbent monumental effigies in stone, which probably date from the early part of the fourteenth century, and are believed to have been brought from another church in the neighbourhood when it was pulled down. The figures are about 7ft. long. One is of a lady, and the other two represent knights, each with their legs crossed; in each case the armorial bearings are the same, and are believed to be those of the Crupe family, who resided at Whittington until the middle of the fourteenth century. In the chancel wall is a fragment of a tomb bearing the same arms. Fragments of very early work and some tiles from the old chancel are carefully preserved in the church, which was restored in 1872. In the churchyard at the east end of the church is the shaft of an old cross. The church and house were originally surrounded by a moat, traces of which still exist, and on the north-east are some very picturesque farm buildings.

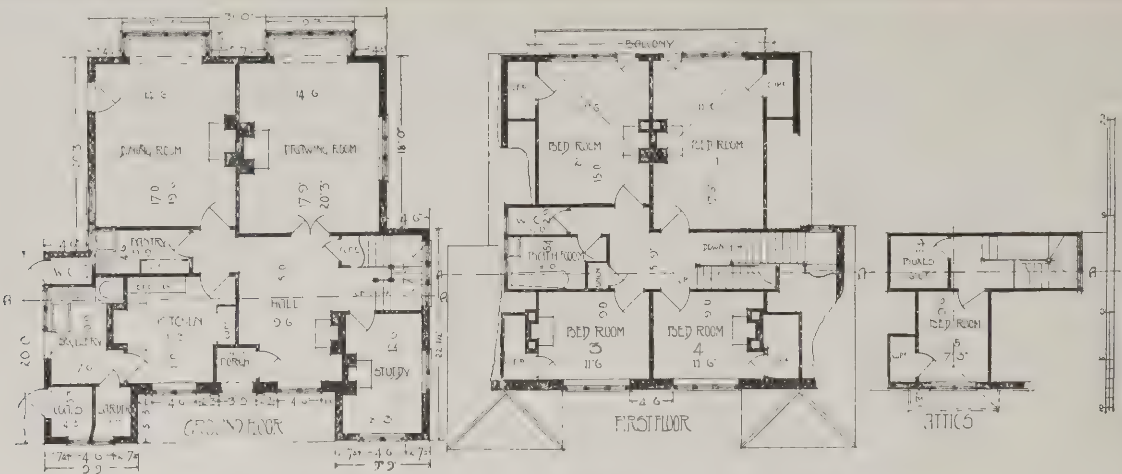
Chipping Norton.

Leaving Whittington and turning to the left off the main road to Chipping Norton, about 10 miles off is Upper Slaughter, a small village containing a fine old manor house and a church. The former is a most interesting building, mainly dating from the sixteenth century, but the basement is probably a couple of centuries earlier, and the two-storied porch is evidently a later addition. The house is situated on the edge of a hollow, there being a difference of about 9ft. between the level of the entrance courtyard and the basement—the house is L-shaped in plan, and the entrance front which faces west has four gables, the one above the porch being much smaller than the others, while the southern elevation, which has three gables, forms the arm of the L. The eastern or back elevation is perhaps the most picturesque, as the grouping and the design of the chimneys are particularly good. Internally there do not seem to have been any dividing walls, and evidently the house has been considerably altered at various times. In one of the rooms there are some good panelling and a fine stone chimneypiece—the house which has recently been occupied as a farmhouse is now being restored.

The church which is close by is an interesting structure of Transitional Norman work, and consists of a nave, western tower, and a chancel, with a stone bell turret surmounting the gable at the east end of the nave. The tower, which is square on plan and somewhat squat, is embattled, and has angle pinnacles, but the upper part is of a later date than the nave. On the south-east of the church is a group of small cottages recently restored by Mr. Lutyens. About 2 miles east of Upper Slaughter is a new house designed by Mr. Guy Dawber, called Netherswell Manor; it was originally built about five years ago, but it has recently been added to and, in fact, completely remodelled. The stables, farm buildings, kennels and engine-house, and the lay-out of the gardens and terraces have all been most carefully designed by the architect. The house is most beautifully situated, and commands some fine views.

Chasleton House.

Some nine miles further on the road between Chipping Norton and Moreton-in-the-Marsh is Chasleton House, perhaps the most interesting building in this district, for as it now appears it seems to belong to the seventeenth century, and everything about it suggests the Stuart period. As it was planned and designed in the reign of Charles I. so it has remained. It was built in 1603 by Walter Jones, a wealthy wool merchant of Witney. The property and original house belonged to the Catesby family, and it was the celebrated Robert Catesby, one of the Gunpowder Plot conspirators, who sold the property to Walter Jones, in all probability to raise money to carry out the plot. The house is a fine specimen of Jacobean work, being built on more formal and symmetrical lines than the other houses in the district. It is square on plan, with a small central courtyard. The entrance front is on the south, with two projecting square bays with no side lights on either side. The one on the left forms a porch, and the other is a bay to the dais of the hall. The staircases are placed in two central towers on the east and west fronts, and on the north side is a small square projecting bay in the centre of the elevation, the whole forming a very symmetrical plan. Externally the house is very imposing, being higher than usual, and the two staircase towers accentuate this. The rooms are full of interesting furniture and good tapestry, and the screen in the hall is a very fine example of Jacobean work. The great parlour at the north-east corner of the building is panelled, and has a fine chimneypiece; there are also several good chimney-



HOUSE AT PARKLANGLEY, KENT. REGINALD C. FRY, ARCHITECT.
These plans are of the house illustrated on the opposite page.

pieces in some of the other rooms. The house contains some good plaster ceilings, that of the long gallery, which has lately been restored, being particularly fine. This gallery, which runs the whole length of the northern front, is 70ft. long and 18ft. 6in. wide. About fifty years ago the house was re-roofed with Westmorland slates. From the top of the east staircase tower a very fine view can be obtained of the beautiful formal gardens below.

Chasleton Church.

On the south-east side of the house is the church dedicated to St. Mary. Part of it dates from the beginning of the twelfth century, Bardolph de Cestron building a church there on the site of an old British burying-place. It is a picturesque building, with a southern tower, the whole forming, with the house, a very pretty group. The church was restored in 1878, when the west-end gallery and high pews were removed, and the old three-decked pulpit, which bears the date 1629, was cut down and reduced in height. The oldest part of the church is the north door; the original tower of the church was destroyed by lightning, and the present one dates from the end of the seventeenth century. To the north-west of Chasleton is Moreton-in-the-Marsh, a very interesting town which time did not permit us to visit, but some ten miles further off in the same direction is Broadway, which has the reputation of being one of the most picturesque villages in this part of the country. The old church is dedicated to St. Eadburga, the granddaughter of King Alfred the Great, and dates from the middle of the twelfth century. It is cruciform in plan, with a plain central tower, the chancel and transepts being of a later date. The nave and aisles were originally covered with lead, but this being stolen, the remainder was taken off and sold about fifty years ago, and the present slate roof substituted. The font is peculiar, being very deep and circular, and entirely without ornament, and probably dates from the sixteenth century. In the north transept are stored the remains of a good Jacobean pulpit and sounding-board. There is also some good glass of the fifteenth century in the windows of the chancel and west end.

The church is some distance from the village, and consequently is very little used, as a modern church has been built which is more accessible. Adjoining the churchyard is Broadway Court, which has been recently added on to by Mr. Guy Dawber. The old house was formerly the residence of the Sheldon family, but the only part of it that is left is the old gateway, which has been utilised as a front entrance to the new house.

Abbots Grange.

One of the most interesting houses in Broadway is Abbots Grange, which formerly belonged to Pershore Abbey, and was built in the fourteenth century. This house has been so often sketched and measured that probably everyone is familiar with it. Considering that it has in turn been used as a village lock-up, a workhouse, and sub-divided into cottages, it has really suffered very little, and its present owner has very carefully preserved the old features of the house, and even the new studio which Mr. A. N. Prentice has lately added is built on the foundations of the old kitchens. Some of the windows show traces of the floors which had been inserted as they are filled in above the transoms. The hall, which has a good open timber roof, runs north and south, with the dais at the south end and the kitchens on the north. There is no trace of any fireplace, and if there was one in the centre of the room there is no sign of any exit for the smoke.

A curiously contrived staircase leads to the Abbot's solar, which has a squint which commands the kitchen door; this room also contains the remains of a fireplace, and has a good two-light window with reticulated tracery.

A Sixteenth Century Inn.

The Lygon Arms is another interesting house. This inn dates from the middle of the sixteenth century, and the entrance door bears the date 1620, and the names John and Ursula Trevis. For over 300 years the inn was known as the old White Hart, the name being changed when it came into the Lygon family at the beginning of the nineteenth century. Charles I. is supposed to have stayed there, and met Sheldon, one of his supporters, in the oak-panelled room, and Cromwell slept here before the battle of Worcester, probably occupying the room which now bears his name. This room has a fine enriched plaster ceiling and frieze.

Chipping Camden.

Passing through the villages of Willersley and Ashton-sub-Edge, both of them containing some very nice domestic work, you come to Chipping Camden, which is supposed to have derived its name from its being the meeting-place of the Saxon Kings, who, at the end of the seventh century, held a conference here about the war with Britons.

The church dedicated to St. James was built at the end of the fourteenth century, chiefly at the cost of William Grevel, the wool stapler. It is in the Decorated style, with a fine embattled tower at the west end 120ft. high, with massive buttresses and surmounted with twelve pinnacles. It has two side chapels, the one on the south side containing a fine monument to Sir Baptist Hicks, first Viscount Camden, who died in 1629. There are also monuments to the Noel family and some brasses, the earliest of which is to the memory of William Grevel, the supposed founder of the church, and his wife; he is described thereon as the "Flower of the Wool Merchants of England." The nave consists of five bays, and has an east window above the chancel arch. There is a tradition that the tower was built by the same builder as that of Gloucester Cathedral, for there is an old rhyme in existence which runs:—

"A man by the name of Bower built
Gloucester Cathedral and Camden Tower."

Near the church a fine mansion was erected by Sir Baptist Hicks at the end of the sixteenth century. It was destroyed by the General in command of the Royalist forces in the civil wars to prevent it from falling into the hands of Cromwell. Very little of the old manor house remains; it was built in the Italian style, and it was probably one of the most magnificent houses of the day, as it is stated that £30,000 was spent on it. Sir Baptist Hicks also built the row of picturesque almshouses near the church, and in 1627 the old market hall, which has a stone arcade and fine open timber roof, and forms the most noteworthy feature in the main street.

The old Wool Staplers' Hall is now used by Mr. C. R. Ashbee as a private residence. It has a curious oriel window which Mr. Ashbee explains was probably the result of rebuilding, in the sixteenth century, the original mediæval window, which had probably fallen. In the big room on the first floor there is a large open fireplace with the arms of the Calfe family in one of the spandrils. Its present owner has done much to preserve the original features of the house. Opposite this house is the one formerly occupied by William Grevel. It has two fine bay windows showing distinct traces of Flemish design.

Some few years ago the Guild of Handicrafts moved from London to Chipping Camden, and the old silk mill became their principal workshop.

Chosen.

Some three miles west of Cheltenham, on the way to Gloucester, is Churchdown, or Chosen, with its church standing right on the summit of a hill some 600ft. to 700ft. high. In all probability this hill served as a Roman signalling station. There is a quaint inscription on the tower recording that this "Belhows was Bvyldede in the yeere of ovr Lorde God 1601." Tradition says that this church served two villages, the one on the north being called Chosen and the one on the south Hucclecote. The inhabitants of the latter village appear to have been very jealous of the former, and it is said that they objected one Sunday to the text, "Make Thy Chosen people joyful," and indignantly asked, "What have the Hucclecote people done?"

(*To be concluded.*)

At Clevedon, Somerset, on October 9th, Mr. Thomas Henry Coles, late manager of the Bristol branch of John Russell and Co., Ltd., died, after a long period of ill-health. In July, 1908, Mr. Coles retired from active work, and was succeeded in his position by Mr. A. H. Sutton.

FIRE-RESISTING PROPERTIES OF VARIOUS BUILDING MATERIALS

Mr. Richard L. Humphrey, reporting upon tests made under his supervision at the Structural Materials Laboratories of the United States Geological Survey, St. Louis, states that the tests were made on thirty panels of various building materials. They were made with a furnace in the Underwriters' Laboratories, Chicago, Ill., to determine the effect of fire and subsequent quenching with water on mortar building blocks made of river and slag sands; common, hydraulic-pressed, and sand-lime brick; gravel, cinder, limestone, and granite concrete; glazed building and partition, terra cotta tiles, and limestone, sandstone, granite, and marble building stone. The mortar building blocks and the concrete were made in the structural materials testing laboratories; the other materials, except some of the common brick, were obtained in the open market at Chicago, Ill. The conditions under which the tests were made were unusually severe, and none of the material passed perfectly. The temperatures used would hardly be reached in an ordinary fire. The furnace has an arched opening, 6ft. by 9ft., in which the material to be tested is built as a wall, against the back of which a gas fire from the furnace is made to play. This wall is on rollers so that it can be run out of the furnace door into the open, where a stream of water can be thrown against it. There are provided pyrometers and thermocouples, by means of which temperatures on either side of the wall can be read at any time. In the tests the opening was carefully filled with the material to be tested, the furnace started, and continued for two hours, and then, except in five out of the 30 panels, the heated side quenched with a 5-minute application of 50lbs. per sq. inch of water coming through a ⅞-in. nozzle 20ft. from the panel. The temperatures varied between 1,400 degs. and 1,700 degs. F., maximum, most often the latter.

Much of the damage done to the building materials in this series of tests was occasioned by internal stresses, the gas flame heating one face of the test pieces much more rapidly than the other face. All the materials tested, including the hydraulic-pressed brick, cracked more or less. The concrete cracked least, but the tests indicate the necessity for using metal reinforcement in concrete walls to distribute the effect of the expansion.

A fact brought out most clearly by these tests is the low heat-transmission rate of Portland cement mortars and concretes. This is one of the desirable qualities in materials intended for fireproofing purposes. For marking the cement blocks linen tags were fastened by wire nails to the interior walls at the time of moulding. Most of these tags remained in place during the test, and when the walls were dismantled, the tags in every case were found entirely undamaged.

An average of all the tests shows that about 90 per cent. of the maximum temperatures attained by the faces of the panels were reached in one hour, while in the case of the mortar blocks the increase in temperature of the backs of the panels in one hour was only about 20 per cent. of the total increase in the two hours. Of the solid concrete panels the cinder concrete showed the smallest increase in the temperatures of the backs of the walls, and the granite concrete the largest. The total increase in the temperatures of the mortar panels was about the same as the total increase in the temperatures of the backs of the concrete, but the increase in one hour was somewhat greater in the case of concrete.

The damage done to the faces of the mortar and concrete panels would probably be caused at a temperature about half that of the maximum temperatures reached, owing to the water of crystallisation being driven from the mortar. This thin layer of dehydrated mortar may have formed a protective coating and prevented deep dehydration.

The backs of the brick panels also showed a small increase in temperature, but the natural building stones and the tiles proved poorer non-conductors of heat. The temperature of the back of a panel composed of plastered tiles increased to 128 degs. C. (262.4 degs. F.).

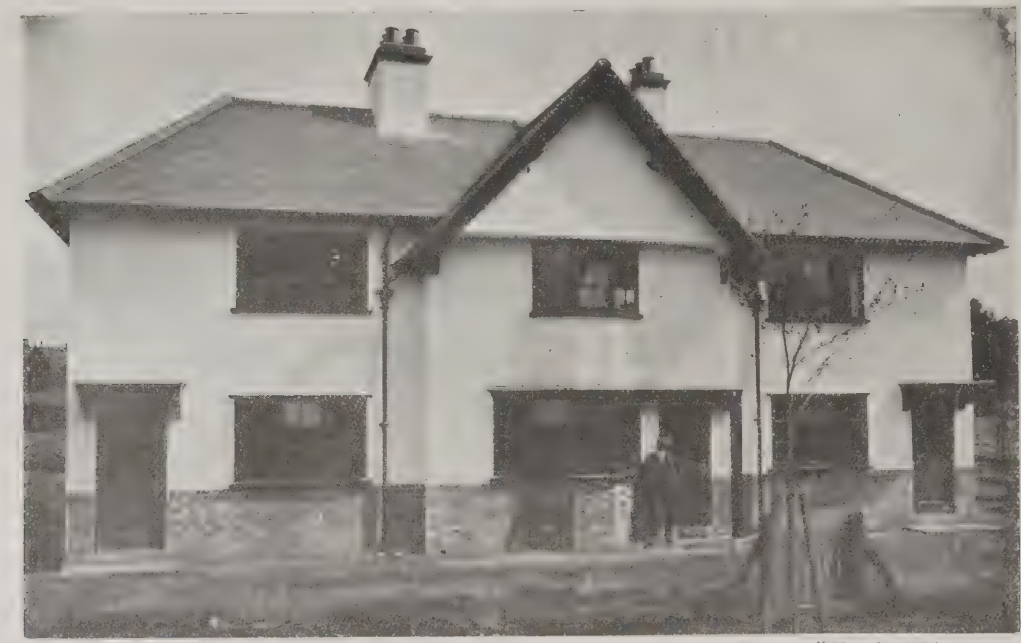
It is apparent that the strength of the webs of ordinary hollow blocks is insufficient to resist the stresses set up in these tests, as in many tests the rapid rise in temperature and the subsequent quenching of one of the faces of the blocks caused the webs to split. It was noticeable that the richer the mortars used in these blocks the better they withstood the tests. The amount of water used in mixing had a similar effect, the greatest percentage of water giving the best results.

When blocks were cracked or spalled before the application of the water, the damage appeared to be greater in the dry mixtures containing the greatest percentage of sand, and it was further observed during the fire test that the richer mixtures warmed up more slowly than the others. It is apparent that one of the causes of weakness in the hollow cement building blocks under these fire tests was the weakness of the concrete, a too dry and lean mixture, which, coupled with the thinness of the webs, provided insufficient strength to resist the stress due to the rapid expansion of the face. It was quite possible, as was shown in some of the block tests, to make blocks which will pass the conditions perfectly; the web must be thick enough to give the necessary strength.

It was difficult to determine whether the limestone, granite, gravel, or cinder concrete sustained the least damage. The faces of all the panels were more or less pitted by the fire and washed away by the stream of water. The test was unfair to the cinder concrete, as the cinder was very poor, containing a large percentage of unburned coal; however, the sample selected was the best of six or eight investigated in St. Louis. During the fire test the coal ignited and left the surface of the concrete very rough and badly pitted. The limestone aggregate in the face calcined, and the granite aggregate split and broke away from the surface mortar. The granite concrete probably behaved the best. The damage in no case extended deeply, probably not more than 1½ins. The evidence shows that even at this depth the temperature was comparatively low. The high stresses produced in the panels by the rapid rise of temperature of the faces while the backs remained cool caused cracks. On taking down the panels the blocks of concrete were found to be cracked vertically for some distance back from the face.

HOUSE AT PARKLANGLEY, KENT. REGINALD C. FRY, ARCHITECT.

The upper part is of warm yellow rough rough-cast, with green shutters, and the base and the two side bays are of soft-red coloured brick.



(*Photo: "Hereford Times."*)

COTTAGES AT THE HEREFORD GARDEN CITY. GROOM AND BETTINGTON, ARCHITECTS.

The serious damage to the various natural building stones precludes any comparison among them.

The tile tested was bought in the open market, and in one panel was taken from a lot of material about to be erected in a building. Large percentages of the faces of the tiles were washed away by the water, and the material composing the faces became soft and could be easily crumbled in the fingers. There was a comparatively rapid rise in the temperature of the back of the panels. The plaster on the panel of partition tile fell off a few minutes after the test was started.

The brick panels probably withstood the tests better than the other materials. The common brick tested comprised unused new Chicago brick, and used St. Louis brick. Fifty per cent. of the new bricks were split, while 60 to 70 per cent. of the old bricks were not damaged. Lime knots seemed to be responsible for most of the damage to the new bricks, as they were found at the bottom of nearly all the cracks. The bricks at the back of the panels were entirely unaffected. While the strength tests are not conclusive, there is apparently little difference in the strength of these bricks before and after firing.

The blocks in tests 1 to 10, inclusive, were made of sand dredged from Meramec River at Drake, Mo., and "typical Portland" cement. They were made in three different consistencies, damp, medium, and wet; and in three proportions, 1 : 2, 1 : 4, and 1 : 8. An equal number of each consistency made in the three proportions were tested in the same panel.

The concrete tested were pieces of broken beams that had been tested in the Government's structural materials testing laboratories at St. Louis, Mo. The pieces were 8ins. by 11ins. in cross section and of various lengths. They were fired with the 11-in. face exposed. In making the concretes, four distinct types of aggregates had been used—limestone, granite, gravel, and cinder. The aggregate was sized to pass a 1-in. screen and be retained on a ¼-in. screen. The concretes had been mixed in proportions of 1 of cement, 2 of Meramec River sand, and 4 of aggregate, and were of medium consistency.

Heretofore fire tests of building material have been made at random, and scarcely any two tests are comparable one with the other; it is, therefore, hoped that the next series of tests made in this type of furnace, where, with the experience gained, the conditions can be more closely controlled, will lead to much more valuable results.

Proposed New Works.

BRISTOL.—A scheme for the rejuvenation of the Bristol and Clifton Fine Arts Academy is shortly to be brought to the attention of prominent citizens, when the Lord Mayor will ask the approval of a plan to bring the society's galleries up to modern requirements. The building in Queen's Road will be substantially remodelled, to allow an entrance on the ground floor, and a fine salon leading to the galleries, and a large verandah on the floor above. The galleries will be extended, and provision made for studios and lecture-rooms for advanced Art, the whole change to entail a cost of some £10,000.

CARLSBAD.—Although considerable sums have been expended in the repair and decoration of the English Church at Carlsbad during recent years, the town architect and engineer have recently reported that large structural and drainage operations are urgently necessary, involving about £500.

DERBY.—After being further amended, the plans of the proposed new Hippodrome at Derby have been again considered by the Improvements Committee of the Corporation. On the last occasion the scheme was unsatisfactory owing to the height of the building, but by making certain alterations it is understood the difficulty has been overcome. Originally the building was to have been three storeys high, but now it will only be two, although the accommodation has not been greatly depleted.

LOUGHTON.—The following plans have been passed:—New drain, Loughton Lodge, Mr. Lomer; villa, Lower Park Road, Mr. G. Booth; re-building "Royal Oak," Messrs. Whitbread and Co.; house, Staples Road, Mr. Carter.

NOTTINGHAM.—A special meeting of the Nottingham City Council has been held for the purpose of dealing with the following resolution:—"That it be an instruction to the General Purposes Committee, and all other committees concerned, to limit the proposed widening of Carrington Street to a total width of 70ft., and that the negotiations with the trustees of the Collins Hospital Estate for the acquisition of land for the widening of the said street and of Greyfriar Gate, and the consequent promotion of a Bill in Parliament be conducted in accordance with the report of the Improvement Committee presented to the Council on February 3rd, 1908." The report referred to dealt with the scheme for widening Greyfriar Gate to 60ft., and Carrington Street to 70ft., the cost being £35,000. The debate in the Council, however, led to the decision being arrived at to widen Carrington Street to 80ft. and Greyfriar Gate to 70ft. at an additional cost of £7,000 or more.

PONTEFRACT.—The Town Council, in spite of pressure from the Board of Education, have been embarrassed for over six months as to the selection of a site for a new elementary school. At a recent meeting of the Council the Education Committee recommended the Friarwood site, and this again was rejected. Other sites were suggested, part of the Micklegate House estates and the old cricket field being included. Ultimately the whole question was again referred back.

WHITBY.—A sub-committee of the County Association have visited Whitby to inspect the equipment, etc., at the headquarters of the local Territorials, the Union Mills. The plans for new buildings, and the question of a suitable site were considered. The matter is to be laid before the County Association and the Army Council.

Falkirk Iron Company have removed from 67, Upper Thames Street, London, E.C., to Craven House, Kingsway, London, W.C. (Telephone: Gerrard 9482.)

* * *

A meeting of the Association of Midland Local Authorities has been held at Birmingham to consider the report in regard to the construction of a new main road from Wolverhampton to Birmingham. Alderman Cook, of Dudley, who presided, referred to the large amount of land lying waste in the Black Country. Such a scheme as that proposed would benefit the numerous districts lying on the route. Mr. G. H. Sankey explained that the proposal was to acquire land for the construction of six miles of new road and the widening of five miles of existing roads. The total cost was estimated at £76,136. The Chairman thought the case was one in which the Development Bill might help them, as the road was not only of local but of national importance. Some discussion followed, and eventually, on the motion of the Town Clerk of Wolverhampton, seconded by the Town Clerk of Walsall, a resolution was passed commending the scheme to the consideration of the local authorities in the districts concerned, and proposing that, subject to their approval, it be submitted to the Commissioners to be appointed under the Development Bill, should that measure become law.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION
Nov. 1.	TECHNICAL SCHOOL, KENDAL. The Corporation of the Borough of Kendal invite architects residing and practising in Westmorland to submit competitive designs, together with written descriptions and estimates, for the erection of a technical school in the borough. A premium of £15 is offered for the design considered by the Corporation first in order of merit, and further premiums of £10 and £5 respectively for those which are, in their opinion, second and third in order of merit; such designs, on payment of the promised premiums, shall become the absolute property of the Corporation. Particulars, etc., together with the plan of site, showing levels, etc., may be obtained free on application to the Borough Surveyor.
Nov. 1.	PRESTON GRAMMAR SCHOOL FOR BOYS. Preston Town Council invite competitive designs and plans from architects practising as principals, for a new grammar school for boys, to be erected in Moor Park Avenue, Preston, and estimates for the same. Premiums of £50, £30. and £20 are offered. The Corporation have appointed a professional assessor. Application to be made to Mr. Alfred Howarth, Town Clerk, Town Hall, Preston, and designs and plans must be sent in by 10 a.m. on Nov. 1.
Nov. 30.	HERNE BAY PAVILION ON PIER. Herne Bay Urban District Council invite competitive drawings for a pavilion to be erected on the proposed extension of the pier at a total cost not exceeding £4,000, exclusive of architect's commission. Premiums of twenty-five guineas and ten guineas. Plan of the site and copy of the conditions may be obtained from J. Jubb, Clerk to the Council, Town Hall, Herne Bay. Deposit: one guinea.
Nov. 30.	TECHNICAL AND SECONDARY SCHOOL, WORKINGTON. The Cumberland Education Committee invite architects to submit sketch plans with outline specification and estimate for a technical and secondary school in the Borough of Workington, Cumberland, for about 300 pupils of both sexes. Further particulars and conditions upon which plans will be received may be obtained from the undersigned on receipt of a stamped and addressed foolscap envelope and the payment of a deposit of one guinea. Deposit returned if all papers sent are returned within seven days. C. Courtenay Hodgson, Secretary, The Courts, Carlisle.
Dec. 18.	TRAINING COLLEGE FOR TEACHERS, Kirkstall Grange, Far Headingly. Leeds. Architects practising in Leeds are invited to submit competitive designs for the above College. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed Assessor. Copies of the conditions of competition and instructions, a plan of each floor of the educational blocks and of the hostel blocks, also an estate plan, showing a suggestion for grouping the various buildings may be obtained from James Graham, Secretary for Education, Education Department, Leeds. Designs to be delivered not later than 12 o'clock noon. Deposit: £2 2s.
Jan. 31 1910.	NATIONAL MUSEUM OF WALES. The Council desires to receive competitive designs for the erection of a new National Museum at Cardiff, Three premiums are offered of £200, £150, and £100, for second, third, and fourth. The Council have appointed Sir Aston Webb, R.A., Mr. John J. Burnet A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A., as Assessors. Particulars and plans of the site will be supplied to competitors on payment of a fee of £2 2s., returnable if all papers are returned within 14 days. Inquiries to be addressed to Dr. Wm. Evans, Hoyle. Director of the Museums. City Hall, Cardiff.

Warrington Elementary School Competition.

The secretary of the Royal Institute of British architects desires us to announce for the information of architects proposing to take part in this competition, that the R.I.B.A. Competitions Committee are corresponding with the promoters with a view to the amendment of the conditions of this competition.

Fire Prevention Notes.

The Fires of Negligence. Speaking of fires in general, Dr. Waldo said, at the inquest held with respect to a fire that occurred last month at London Wall, E.C., that he frequently found that fires in the City of London were due to gross negligence, and that a revision of the law might prevent a lot of unnecessary fires. At present, for instance, it is no offence to throw down a light, unless, at the same time, a felony, such as burglary, is being committed. He was of opinion that culpable carelessness, short of arson, should be made a punishable offence at law. With this, drastic though it may seem, we cannot but concur. Offences of far less serious consequences are made penal. We have advocated, and we should have preferred, the education of the people in the minor arts of fire-prevention. But, even if such education were rendered very complete, and were spread to the utmost extent, there would still remain a large number of criminally careless persons, whom only the sharpest lessons—those consequent upon violation of statute law—would bring to a just sense of their obligations to the community. A very large proportion of the total number of fires of unascertained origin no doubt arise from undisciplined habits, such as the careless throw-down of matches and of cigarette ends. Gross negligence was not alleged with regard to the fire under notice. The outbreak was traced to some warm ashes which had been left in a lift.

Fires and Fees. Inadequate realisation of our obligations with regard to fire prevention is again made evident in some observations that were made by Mr. Christopher W. Surrey, district surveyor for the western division of the City of London, and by Dr. Waldo, the coroner. Mr. Surrey had made a survey of the burnt premises; but, judging from former experiences, he will probably have considerable difficulty in extracting his fees from the London County Council. The Coroner, commenting on Mr. Surrey's position in the matter, said that he (Dr. Waldo) had had a similar difficulty when he was appointed coroner for Southwark. He was unable to get any money until he appealed to the Home Office, who then allowed him at the rate of 6s. 8d. per inquest, whilst other London coroners were paid at the rate of 30s. per inquest! If Dr. Waldo gets no more than 6s. 8d. for inquiring into the causes of a serious fire, if 6s. 8d. is the measure of the Home Office conception of the importance of such inquiries, and if the L.C.C. values the

Photo: Topical.

THE FIRE AT A HOP WAREHOUSE IN SOUTHWARK. PULLING DOWN THE WALLS.

This fire was somewhat remarkable inasmuch as it was left to burn out.

fire surveyor's services at stark naught, it is pretty plain that our public authorities have but a feeble sense of their responsibilities with regard to fire prevention.

Match-boarding. The recommendations of the jury on the London Wall fire deserve more than casual notice, because they admit of pretty general application. "They considered that the premises were not adequately provided with means of escape in case of fire; and they strongly recommended that all businesses of a dangerous nature should have no matchboarding to the walls or lifts." It is to the latter recommendation that we would draw particular attention. This should be more than a recommendation. It should be a legally imposed obligation. The persistency with which building owners adhere to dangerous materials is sufficiently marked to warrant legal enactment compelling the adoption of fire-resisting materials, if not in all buildings, then certainly in buildings which, like the premises under notice, are to house inflammable goods. The building in London Wall was in the occupation of a firm of wholesale milliners, and it was stated that many of the articles used there in the manufacture of ladies' hats were highly inflammable, some containing celluloid. Yet, apparently, matchboarding was used for lining some of the walls! Unfortunately, there is no novelty in this condition; and yet the lesson of frequent fires is not sufficiently impressive to prevent its constant repetition. It is fairly clear that nothing short of legal compulsion will cause the general adoption of fire-resisting materials. It is not as if such materials were unavailable. They exist in abundance, and as they are not exorbitantly dear, there does not seem to be any valid excuse for imperilling life and property by failing to adopt them.

French Fire Prevention Committee. The three days' meeting of the French Fire Brigades Federation recently held at Caen, is likely to be fruitful of result. At the business meeting held under the chairmanship of M. Chéron, Under-Secretary of State for the Navy, Mr. Edwin O. Sachs, who attended by special invitation, read a paper in French on the working of the British Fire Prevention Committee in this country, and the safeguards that have been adopted at its suggestion. After some discussion, it was unanimously decided that a special commission should be formed with a view of organising a similar committee in France in connection with the French Federation, and M. Lepine, Police President in Paris, consented to act as chairman of this commission. Among the matters touched on in the course of the discussion were the great loss incurred by the navy from fire, amounting to something like 69,000,000 francs in a short period of years, also protection of small children from danger of fire, by the prohibition of dangerous flannelette, the compulsory use of fireguards, and the like.

Cement and Brick. Commenting on the report of fire tests of various building materials conducted by Mr. Richard L. Humphrey, of the U.S. Geological Survey, the editor of the "Cement Age" very naturally assumes that the results are encouraging to manufacturers and users of cement. About the only competitor concrete has in the way of a fire-resisting material is brick, and even its efficiency as applied to building construction must depend upon sound Portland cement mortar. In other words, a brick, considered as a clay unit, is not prone to disintegrate under extreme heat; but even with that fact established, or admitting, for argument's sake, that brick is infinitely superior to concrete, there would still be no occasion to fear serious competition on that score. Concrete lends itself to fireproof construction in many ways that make it more desirable than brick from both mechanical and economical standpoints, as, for example, in the construction of columns, beams, floors, etc. In an ordinary conflagration, concrete, the writer claims, offers superior advantages from the standpoint of slow heat penetration and protection to the vital parts of a structure. When it comes to the matter of cheap repairs, no material compares with it. A matter of great importance brought out by these tests is the statement that it is quite possible to make concrete blocks which will pass the conditions perfectly. This should be noted by blockmakers as affording opportunity to put that industry on a better basis. Rich mixtures, the use of plenty of water, and an increase in the thickness of the web, are the essential requirements of a fireproof concrete block as determined by these experiments. Apart from brick, the writer concludes, which is not as economical or satisfactory as concrete for the reasons given above, no other material, according to the government tests, stands upon an equality with it, the various building stones and hollow tiles disintegrating rapidly under the stress of fire and water.

THE FIRE AT THE HOP WAREHOUSE IN SOUTHWARK.

The fire, as mentioned on the preceding page, was allowed to burn itself out, owing to the danger of the hops swelling and bursting the walls if the hose had been turned on them.

Mr. Leonard Stokes, F.R.I.B.A., having been appointed to act as assessor in the competition for the proposed Town Hall and Municipal Offices, Johannesburg, South Africa, will embark on December 11th.

* * *

Messrs. E. A. Roome and Co., builders and contractors, of 36, Basinghall Street, E.C., have secured the contract for the erection of a country house and stables at Ashtead. The architects are Messrs. Whitfield and Thomas.

* * *

We are informed that Mr. Thomas Athey, formerly manager of Messrs. Spencer, Santo and Co., has joined the staff of the British Uralite Company at 16, St. Helens Place, E.C. Mr. Athey's extensive practical experience of all matters appertaining to building operations will be at the service of the company's clients in estimating for the erection of buildings constructed of its various fireproof materials. The company has an extensive connection with the various Government Departments, and with most municipal bodies, which it is believed the foregoing arrangement will tend to extend.

Works in Progress and Completed.

CARDIFF.—The plans of the proposed temperance institute and swimming baths at Clarence Road, which were prepared by Mr. E. W. M. Corbett, F.R.I.B.A., architect, have been approved of. The institute, which will really be a substitute for the present building, is estimated to cost about £8,000 or £10,000, and will provide accommodation for about 2,000 members.

DONCASTER.—The extension of the Doncaster Cattle Market which has just been opened, has been carried out at a cost of about £11,000, of which £6,933 has been paid for property, the remaining £3,000 being expended in the erection of a new sale ring and pens for cattle, paving, etc.

DONCASTER.—The Education Committee have accepted the tender of Mr. J. T. Wright, of Leeds, amounting to £12,733, for the erection of a new High School for Girls, which is to be built on the site of Chequer House. The architects are Messrs. J. M. Bottomley, Son, and Wellburn, of Leeds.

DUNBLANE.—The new institute which has just been opened, consists of billiard-room, library, reading-room, etc. The cost, amounting to over £2,000, was raised by subscriptions. The architects are Messrs. Davidson and Son, of Coatbridge.

GARTH, MAESTEG.—The new Workmen's Hall and Institute, which was opened recently, provides on the ground floor a large hall to accommodate about 500 people, with retiring rooms, etc., as well as a large billiard-hall. On the first floor are a reading-room, library, club-room, etc. The work has been carried out by Mr. W. Lewis, Maesteg, from plans prepared by and under the superintendence of Mr. W. Beddoe Rees, architect, 3, Dumfries Place, Cardiff.

HAMILTON.—We published recently some particulars concerning the new Baptist Church which has been erected here. We are now able to give some additional information. The church buildings occupy a commanding site on rising ground The church has been placed with main gable and entrance fronting Kept Street, the hall build-

THE EFFECT OF FIRE ON EXPOSED GIRDERS. *Photo: Bolak.*
This girder was red-hot for over an hour in the fire at the premises of Messrs. McCorquodale & Co., Ltd.

ings and offices fronting New Street. The main doorway to church enters into the front vestibule, from which there is access to church and galleries. There are transepts at pulpit end, and the apse is formed so as to accommodate an organ. Accommodation for 630 persons is provided. The baptistry is placed in the apse, and is specially planned in relation to retiring rooms. The large hall is seated for 462 persons, including the back gallery. A lesser hall, seated for 133 persons, has been placed at the side of the large hall, having folding partitions, so as to be easily added to the large hall, making the combined accommodation 600. Ample provision is made for heating, lighting, and ventilation on the most approved methods. The church and halls are provided with handsome open timber roofs, and the windows are glazed with leaded glass. The walls are of red stone, and the roofs are slated with green slates, having red tile ridges. The style of architecture is late fifteenth century Gothic. The total cost of the building is £5,200. The architects are Messrs. Miller and Black, F.R.I.B.A., I.A., 58, Renfield Street, Glasgow.

HOYLAND.—The recently opened adult school has been erected at a cost of £2,000. Mr. J. W. Wilson is the architect.

KING'S LYNN.—The parish church of Gaywood, King's Lynn, an ancient structure with remains of Saxon and Norman work, has undergone considerable restoration and extension under the direction of Mr. W. D. Caröe. The chancel has been restored and refitted, and an oak reredos, the work of Mr. N. Hitch, has been erected by the rector, the Rev. H. S. Radcliffe, as a memorial to his father; the east window, the work of Messrs. Powell, of Whitefriars, has been placed in memory of the late Sir David Radcliffe, of Liverpool, by members of his family, and the erection of a vestry, organ chamber, and south chapel and the restoration of the transepts have been carried out by public subscription. A sum of £2,500 is still required to complete the work arranged for by the architects' plans.

LIVERPOOL.—Mr. Gilbert Scott, the architect of the new cathedral, has submitted to the cathedral committee the designs of the chapter house which the Freemasons of West Lancashire have decided to erect, at a cost of £10,000, in memory of the late Lord Lathom.

LONDON.—Owing to the ever-increasing demand for their celebrated productions, the well-known house of Messrs. L. and C. Hardtmuth have decided to erect in Kingsway a building worthy of the magnitude of their business. This will be commenced shortly from the designs of Mr. J. S. Gibson, of 5, Old Bond Street, the builder being Mr. Jas. Carmichael, of Wandsworth. It is needless to add that Messrs. L. and C. Hardtmuth are the well-known manufacturers of pencils, including the celebrated Koh-i-Noor, besides being the sole European representatives for Waterman's Ideal Fountain Pens. The building will bear the appropriate title of "Koh-i-Noor House."

LONDON.—To provide work for the unemployed, a scheme has been prepared for renovating the south and west fronts of the Alexandra Palace. The total cost of the work is estimated at £4,370.

LONDON.—Rapid progress is being made with the scheme for re-erecting Crosby Hall at Chelsea; the houses in Danvers Street have been demolished, and already the contractors have excavated 20ft. of the foundations for the new hall. The work of erecting the building is expected to commence shortly, and the new stonework to take the place of the rubble walls, is being carefully prepared.

LONDON.— The new subway which has been constructed for pedestrians from the north-west corner of Blackfriars Bridge to Queen Victoria Street, with spurs going east and west to opposite the District Railway station and the Royal Hotel respectively, will shortly be opened. The cost has been £30,000.

MANCHESTER.—The Manchester University new chemical laboratories which have been designed by Mr. Paul Waterhouse, F.R.I.B.A., were recently opened by Sir Henry E. Roscoe, Lord Morley presiding at the ceremony in his capacity of Chancellor of the University. The new buildings form the completion of the south-western corner of the western court, as they touch the medical school buildings, being built up against their southern wall. Mr. Waterhouse has kept the design of the building facing the smaller court studiously plain. In the elevations which face the large quadrangle he has endeavoured to produce a result in harmony with the adjoining design of his late father, Mr. Alfred Waterhouse, R.A. The walls are faced with buff bricks, and the window dressings, copings, strings, and other stone work are of Stanton Woodhouse stone. The work has been carried out by Messrs. George Macfarlane and Son, contractors, Manchester, and superintended by Mr. L. Knowles.

MITCHAM, SURREY.—The foundation stone of the new church about to be erected in the Mitcham Lane for the district of St. James', Streatham, which contains an increasing population of over 8,000 souls, has just been laid. The accommodation to be provided is for 723, and the cost will be £4,522.

NEW SOUTHGATE.—The foundation stone of Christ Church Congregational Church, New Southgate, was laid on October 9th. The design is in late Gothic. Bath stone is being used for the dressings, pressed red bricks for the facings, and pitchpine for the joinery. The contract has been let for £4,597, to Mr. Jas. W. Jerram, Crown Works, East Ham, E.; the architects are Messrs. George Baines and Son, 5, Clements Inn, Strand, W.C.

PINNER.—The foundation stones of a new Baptist Church which is to accommodate about 500 worshippers, and which is estimated to cost, exclusive of site, about £4,300, were laid recently. The church has been designed in late Gothic style, and the plan is in the form of a Latin cross. Messrs. Spalding, Spalding and Myers, A.R.I.B.A., of Watford and London, are the architects, and Messrs. Brightman and Son, of Watford, the contractors.

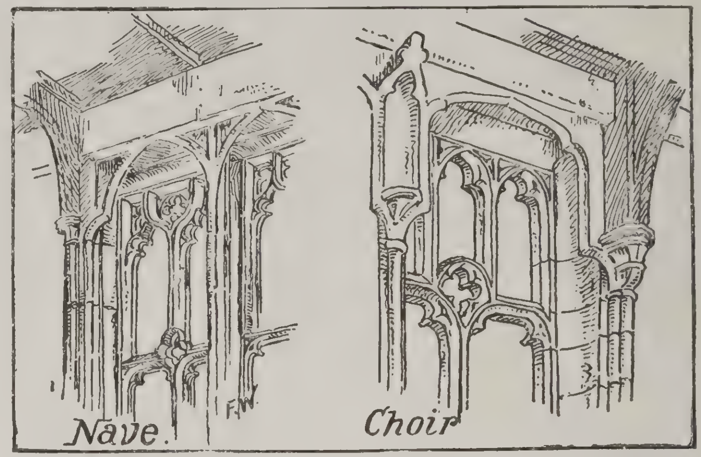
Photo: Bolak.
THE EFFECT OF FIRE ON IRON WINDOW FRAMES.
Another illustration from the fire at the premises of Messrs. McCorquodale & Co., Ltd.

TRURO.—The Truro Cathedral Building Committee have reported that the dedication of the towers, with their spires and the bells, is likely to take place on May 20, 1910. With the completion of the towers and spires, and the provision of the bells, the Cathedral church as such, will be completed, but there will remain the erection of the Chapter House and the cloister court.

WOLVERHAMPTON.—The new swimming baths, Wolverhampton, and the extensions to the Wolverhampton Town Hall, which are under the supervision of Mr. Geo. Green, the Borough Surveyor, are now approaching completion. The whole of the reinforced fire-resisting floors on both these works, including the wood block flooring at the Town Hall, are being carried out by Messrs. Homan and Rodgers, Manchester.

WORCESTER.—The foundation-stone of a new church which is being erected for St. Martin's parish, Worcester, from the designs of Mr. G. H. Fellowes Prynne, F.R.I.B.A., was laid recently. The church, which will accommodate 650 adults, will involve a sum of £4,650 in its building.

WRECCLESHAM.—At Wrecclesham, a little village of under 2,000 inhabitants, near Farnham, new Church schools have been erected at a cost of £3,518.



CLERESTORY WINDOWS, CHURCH OF ST. JOHN THE BAPTIST, COVENTRY. (From "The Churches of Coventry.")

THE CHURCHES OF COVENTRY.*

A most interesting addition to Messrs. George Bell and Sons' excellent "Cathedral Series" is "The Churches of Coventry." To say that it is one of the best of the cycle is to accord it high praise. The "Spires of Coventry" as almost world-famous; and, as Sir William Dugdale has said, the place is "remarkable for antiquity, charters, rights, and privileges, and favours shown by monarchs." Indeed, as the author of this volume has found to his advantage, the unusual fulness of the archives, the accounts and records of its guilds and companies, and the close connection of these with the church, supplies a larger body of information than is often at the disposal of the historian of a parish. Chief among the churches, both architecturally and historically, is St. Michael's, whose special glory is its steeple, the height of which—300ft.—is about equal to the length of the church. The only other parish church having a steeple of equal height is that of Louth, Lincolnshire, and the only English cathedral spires exceeding it are those of Salisbury and Norwich; and the Coventry tower exceeds in richness of design that of any other parish church. The nave, which is 37ft. 6ins. wide in the clear exceeds, in this respect, many cathedrals. It is of six bays, and is 54ft. high in the centre, while each arch is 20ft. wide in the clear. The oldest existing portion of the church is the large south porch, of which the date is not later than 1300. The other buildings or remains dealt with are the churches of Holy Trinity and St. John the Baptist, the Grey Friars' Convent, the White Friars, St. Mary Hall, and the Carthusian Monastery. The book is well produced, and contains forty illustrations, from which we are permitted to reproduce the four here shown.

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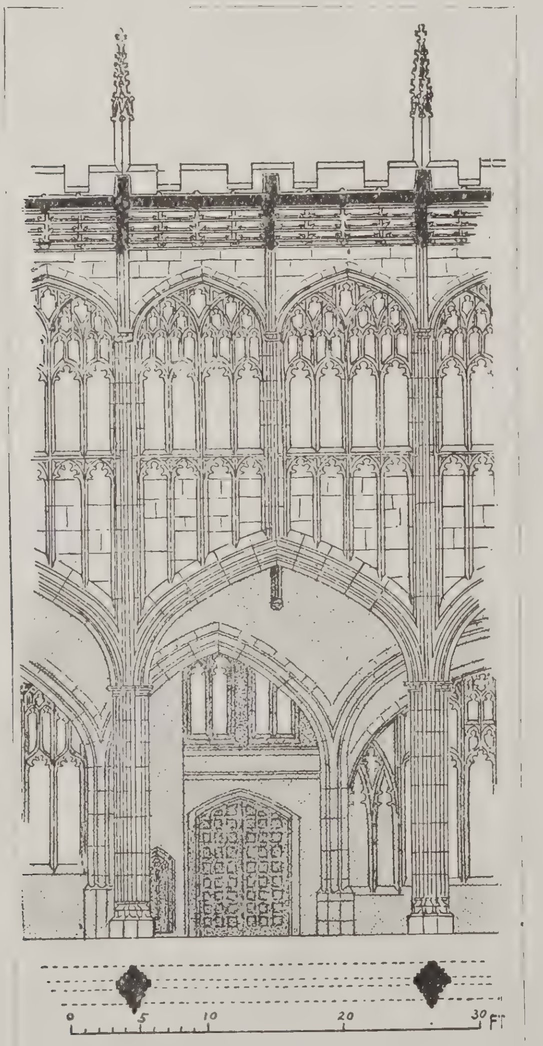
*The Churches of Coventry. A short History of the City and its Mediæval Remains. By Frederick W. Woodhouse. London: George Bell & Sons, Portugal St., W.C.

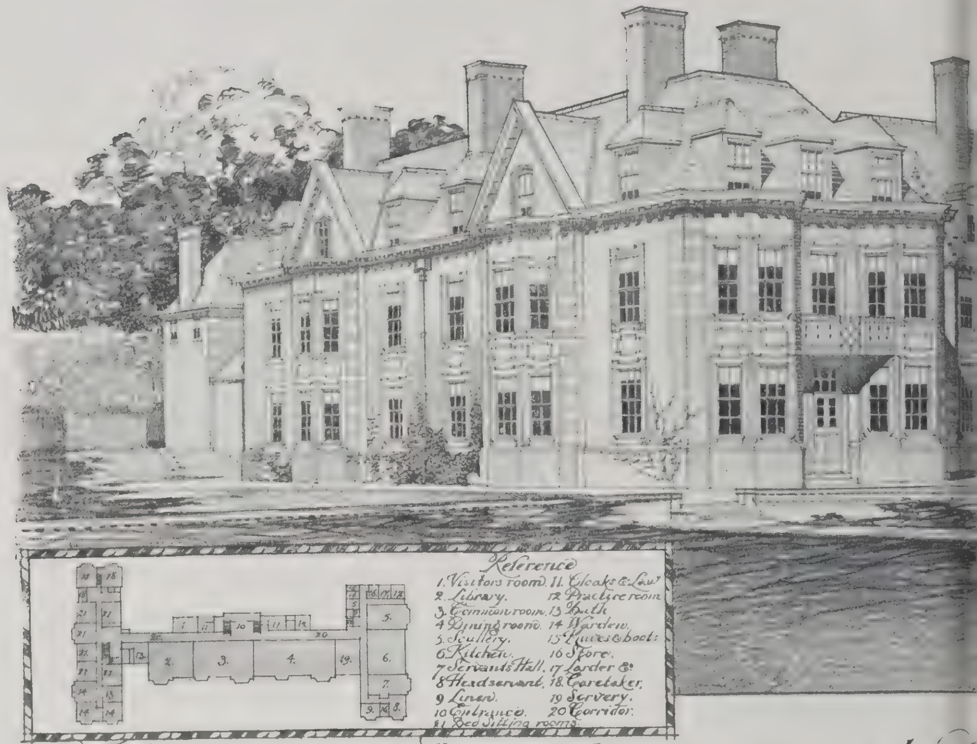


BAY OF NAVE NORTH SIDE, ST. MICHAEL'S CHURCH. COVENTRY. (From "The Churches of Coventry.")

NEW UNIVERSITY COLLEGE OF SOUTH WALES.

The New University College of South Wales and Monmouthshire, which was opened recently, stands on a site of five acres, the gift of the city, valued at £20,000. Of the proposed buildings only the arts department, the library, and the administrative block have been erected. The expenditure on these has been £130,000, and the total amount to be ultimately spent will be £260,000. The buildings occupy a fine position in the park, and have a beautiful outlook on extensive ornamental gardens and King Edward's and Museum Avenues, which are lined with trees. The facade of the college is decorated with designs representing

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS


Reference
1. Visitors room.
2. Library.
3. Common room.
4 Dining room.
5. Scullery.
6 Kitchen.
7 Servants Hall.
8 Headservant.
9 Linen.
10 Entrance.
11 Bed Sitting rooms.
11. Cloaks & Lav.
12 Practice room.
13 Bath
14 Warden.
15 Knives & boots
16 Store.
17 Larder &c.
18. Caretaker.
19 Servery.
20 Corridor.
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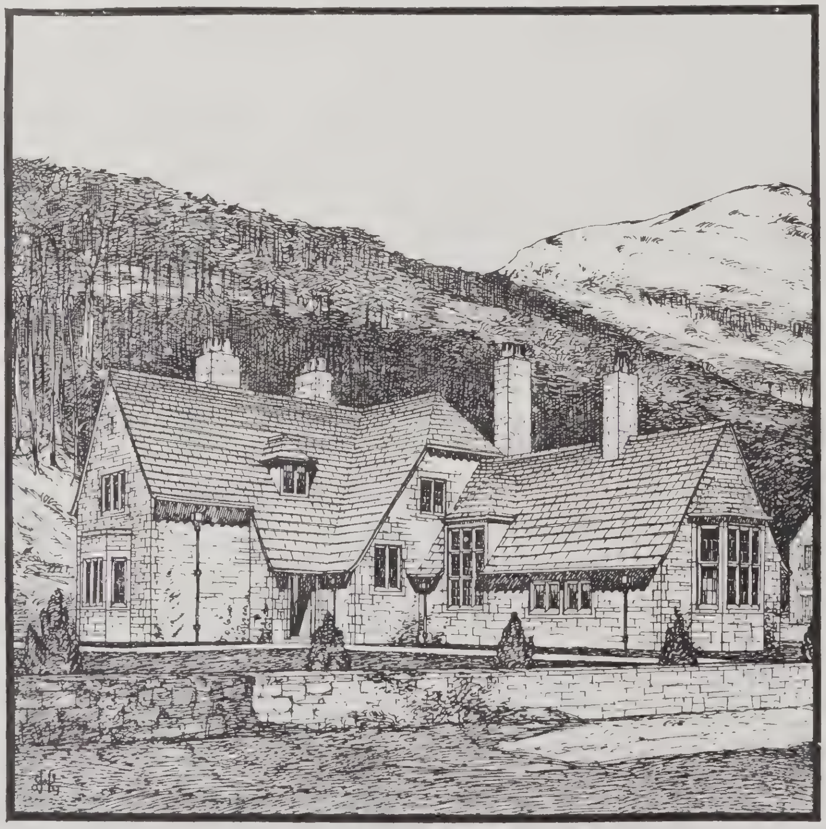
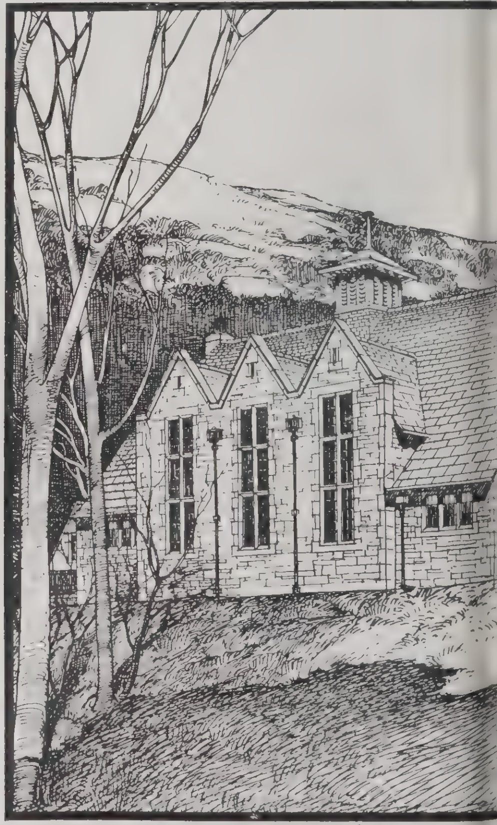
Hostel for Women Students at the B



THE·SUPERINTENDENT'S·HOUSE



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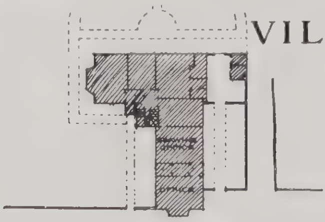
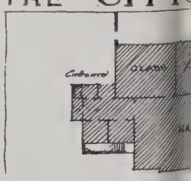
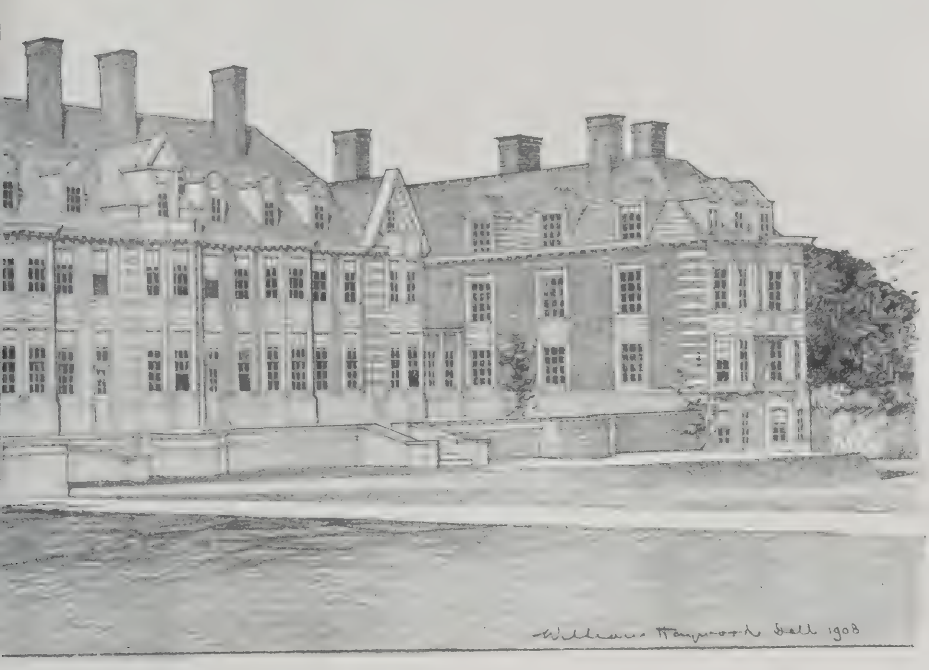


VILLAGE IN·THE ELAN·VALLEY FOR·THE "CITY

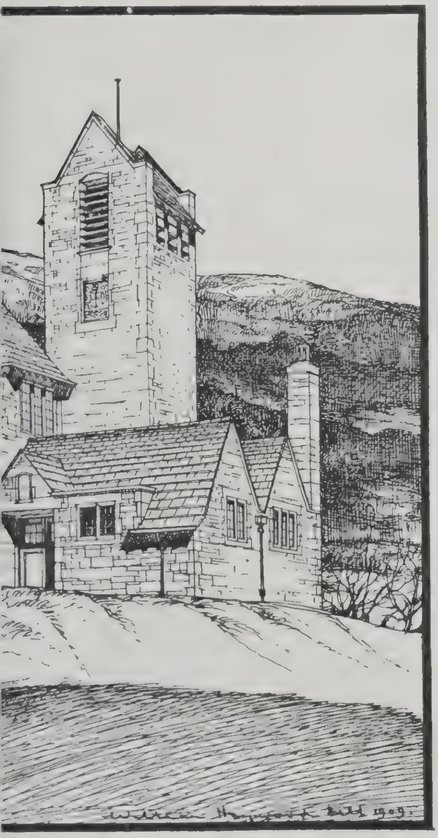


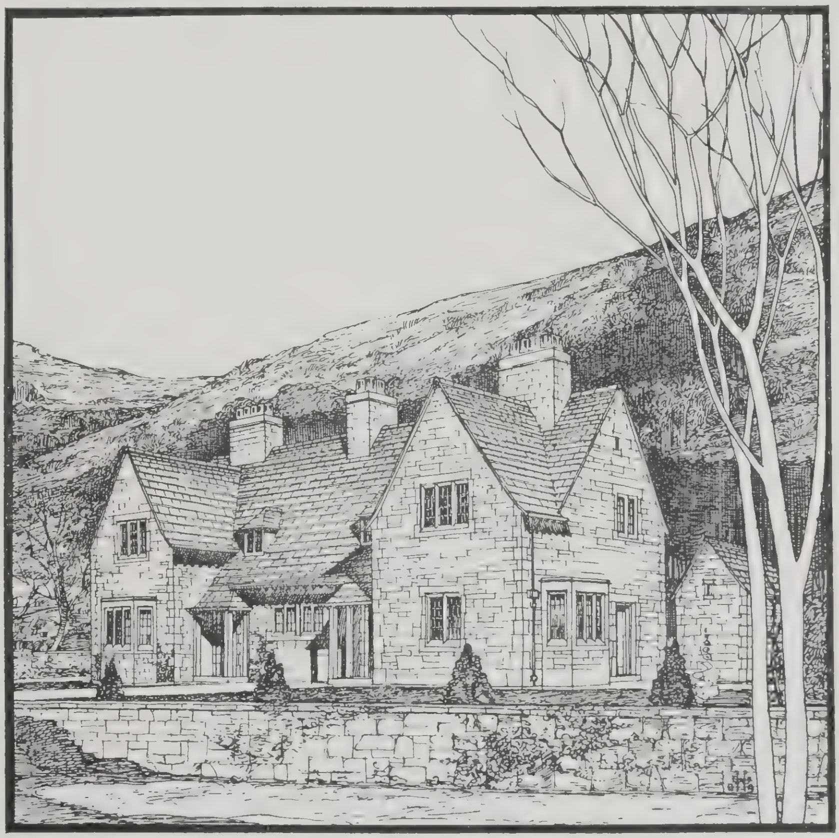
H. T. BUCKLAND AND E. HA



mingham University

Herbert T. Buckland & E. Haywood Farmer
Architects.





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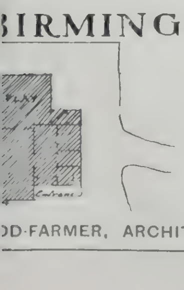
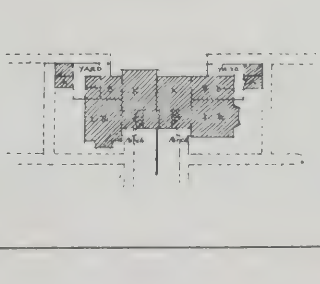
A·PAIR·OF·COTTAGES

BIRMINGHAM·WATER·DEPARTMENT"





OD·FARMER, ARCHITECTS.

the arts and sciences, and the arms of the presidents of the college, past and present, and the arms of Wales and divisions of Wales. One enters into an extensive vestibule, at the further end of which is a finely executed statue by Mr. W. Goscombe John, R.A., of the late Principal Viriamu Jones, first principal of the college. The grand staircase is constructed of alabaster from the Rhetian rocks at Penarth. From the balcony in front a fine view of the park is to be had. The library, to the erection of which the Drapers' Company made a gift of £16,000, is surmounted with a semi-circular roof, and three large windows at one end bear the arms respectively of the Prince of Wales, the Drapers' Company, and the college. It has space for 100,000 volumes, and is lighted in the main from the roof. Until the great hall is erected the library will serve for large meetings. A narrow gallery 100ft. long has been specially constructed for optical experiments. All the interior woodwork is of American white wood or fumed oak. The outer walls of the building are of Portland stone. When the whole scheme is completed the buildings will be symmetrically grouped round a great court, larger than Tom Quad, Christ Church, the largest quad in Oxford. In designing the buildings, the architect (Mr. W. D. Caröe) says that he "had in mind the many delightful classical and semi-classical examples in both our ancient Universities, and has endeavoured to give a flavour to the building which, while being distinctly modern and of its time, is intended to recall some of the feeling which is so characteristic of that typically British, and at the same time scholarly, architectural development."

Our Plate.

Women's Hostel, Birmingham.

The building was completed some months ago and occupies a site in close proximity to the new University. The building has been erected as a residence for the lady students attending the University. About sixty bed sitting rooms are provided, with wardens, private rooms, and office, large common room, library, and dining room. The floors and staircases are of fireproof construction. The buildings are faced with black country bricks and dressings of mottled Hollington stone. The roofs are covered with Westmorland green slates. The general contractors for the work were Messrs. Richard Fenwick, Ltd., who also carried out the reinforced concrete work to floors on the Coignet system. The heating was executed by Messrs. Ashwell and Nesbit, of Leicester. The architects are Messrs. Buckland and Haywood-Farmer, of Birmingham.

Village in the Elan Valley.

The illustrations show some of the buildings which have recently been erected by the Birmingham Corporation in the Elan Valley, near Rhayader, South Wales, in connection with their water scheme, and provide accommodation for the workpeople engaged upon the work in connection with the reservoirs and filter beds. The school buildings take the place of the structure which was removed to make way for the works in connection with the construction of the reservoirs. The village occupies a site which was at one time covered by wooden huts accommodating nearly 2,000 workmen at one time engaged upon the engineering work. The new buildings are constructed of rubble of local stone, with dressings of a hard grit stone, and the roofs of green slates. The contractors were Messrs. Henry Lovatt, Ltd., of Wolverhampton, and the architects are Messrs. Buckland and Haywood-Farmer, of Birmingham.

The London County Council was recommended by the Fire Brigade Committee, on yesterday's agenda, to appoint Lieutenant Henry Spencer, R.N., as Assistant Divisional Officer of the Fire Brigade. Other names submitted were those of Engineer-Lieutenant P. J. King, R.N., and Mr. E. G. French.

Enquiries Answered.

The Portico of the Pantheon.

STAFFORDSHIRE. — NEWCASTLE writes: "I send tracing (not reproduced) from Spiers' Orders, of capital to antae of the portico of the Pantheon. Kindly explain why the mould of the abacus is not of the same section throughout as is that of the columns. The circles xx on tracing are not concentric. The mould at the angle appears narrow on plan, and seems to widen as it approaches the centre of the capital. Also, why are the antae fluted and not the columns, as I understand they were of coloured marble? As the columns and antae were not made for the Pantheon, were they all obtained from the same place?"

—The illustrations to the Orders are reproduced from Normand's Parallels, published in 1829, which have never been contraverted. The column and its capital constituted part of the peristyle of Agrippa's temple, built probably about 27 B.C., and were re-erected after the completion of the Pantheon by Hadrian in 124 A.D. The antae are part of the latter, consequently the abaci are of two different periods, and Hadrian's architect decided not to make the curves of the upper and lower edge of the abacus concentric. The antae of the portico are in marble and fluted; the columns are monoliths in polished granite, which accounts for their not being fluted.

R. PHENE SPIERS.

Book on Reinforced Concrete Formulæ.

LIVERPOOL.—E. B. G. writes: "Please let me know whether there is any hand-book of reasonable size dealing with reinforced concrete formulæ, on the same lines as, say, Molesworth, for ordinary engineering calculative rules?"

—Marsh and Dunn's "Manual of Reinforced Concrete" (Constable, 7s 6d.) would no doubt suit our correspondent's purpose.

Reinforced Concrete Flooring.

In renewing the floor of a 1st floor barrack block, one floor high, it was discovered that the binder was rotten and must be renewed. Some Kahn bars being spare from another job, it is proposed to make a reinforced concrete beam with these bars, to support joists and floor. The old joists are to be used again. The walls of the building are 18in. thick, built with lime mortar, and are fairly old. The space is 22ft. × 21ft., but, owing to openings in walls, the beam must be built 14ft. 6in. from one end. Will you please say what you consider the size for this beam? These Kahn bars are ¾in. thick, and are long enough for stirrups of bars to tension from centre of span."

—The larger slabs need to be 7ins. thick, with ¾in. Kahn bars placed at 16in. centres, and in the smaller slab at 24in. centres in 4in. thickness, while the beam should be 15in. deep × 20in. wide over all depth from top of floor, and embedded in same 2in. from the bottom there should be No. 8—¾in. Kahn bars. In the floor slabs the bars may be only placed about ½in. above the soffit.

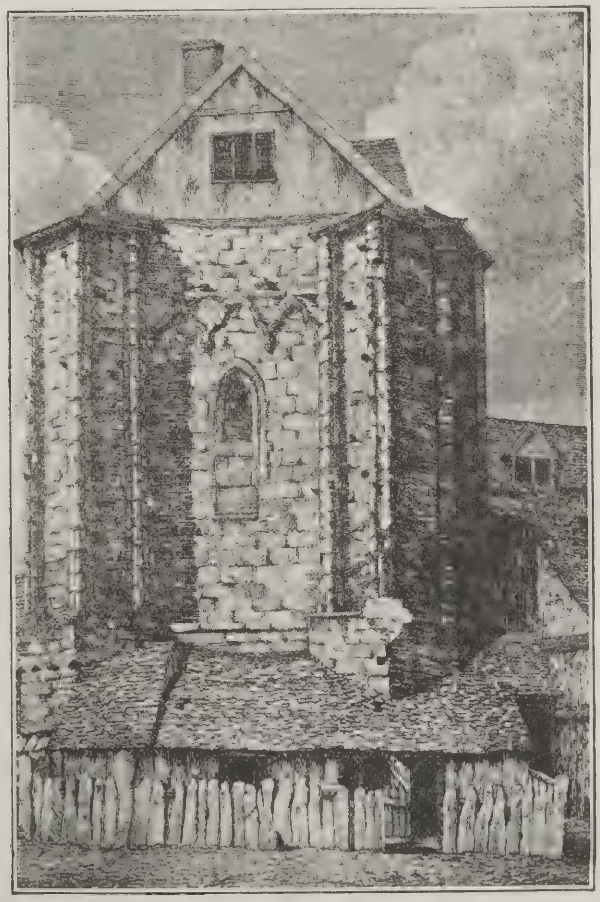
Taking-off Quantities.

ST. HELENS.—A. W. writes: "Please show how the quantities should be taken out for the work shown in the accompanying sheet of drawings [not reproduced]."

—The correct dimensions for the deductions of brickwork and facings for the window opening shown are as follows:—

4 0 1 Bk. deduct and
7 0 Deduct Ex. to red brick facing.

It is the custom, when dealing with these arches, to deduct only up to the springing of the arch, with semi-circular Gothic pointed or even with segmental arches, having a very considerable rise, the nett area of the void would be taken. The dimension I give is, however, correct in this instance.



REMAINS OF THE NORTH-WEST TOWER OF THE PRIORY AND CATHEDRAL CHURCH, COVENTRY. (From "The Churches of Coventry.")

SOUTH-WEST DOORWAY, ST. MICHAEL'S CHURCH, COVENTRY.
(From "The Churches of Coventry.")

The space occupied by the sill is not deducted from the common brickwork, nor is the face area of the sill deducted from the facings—the sill is only shown two courses high; if it were three or four courses high it would be correct to make the deductions.

It is customary to make the deductions for openings in two dimensions—one for the external reveal, which I presume we are taking now, and another for the internal reveal, the external reveals being deep. There is the facing to them to be measured as under:

2/ 9 Add Red Bk. facings (reveals).
7 0

Then as regards the arch:—

4 3 Centre to segmental aperture.
9

4 3
4 9
2)9 0
4 6

4 6 Extra on Common Brickwork to neatly axed segmental arches in red bricks set in cement and pointed to match facing.
1 1 and
Deduct Ex. to red Bk. facings.

4 3 Add Arch as above (soffit)
9 and
Clean off soffit of arches after pointing centres.

2/1 1 Fair skewback cutting in red Bks.

4 9
2/1 1 2 2
6 11

4 9 Fair circular cutting in do.

Cuttings measured by the foot run are assumed to be only 4½in. from the face of the wall—in this case we have 9in. to make up—therefore add,

6 11
4½ Rough cutting.

Assuming that you do not intend to measure the labours on the stonework, you are practically correct. A better description would be however:—

16 6 String 10ins. × 8½ins. weathered, moulded, girth, and dentilled.

2/ 1 Labour only to working mitres, returned end to weathered, moulded, girth, and dentilled string.

Assuming that the stone is jointed each side of the pilaster caps, the correct description is:—

6/ 1 Pilaster caps 1ft. 9ins. on face, 1ft. 1in. on bed, and 10ins. high; weathered, moulded, girth and dentilled on face, and two short returns with internal and external mitre to each return.

The correct size of the stack shown is 3ft. 4½ins. × 2ft. 7½ins. (unless the bricks used are larger than London stocks), and the following dimensions give the quantities of the cap:—

3 4½
Mean projection. 2/3 6
3 10½

2/3 11
1 6
2/2 8 } ⅓ B add.
1 6

3 4½
2 7½
6 0
2 0
12 0
Add
8/3 2 0
14 0

14 0 Add Extra to red brick facings:—
1 6 (face of cap)

6 0
2 0
12 0
4/3 1 0
13 0

2/13 0 Add facing as last (top and bottom of cap).
3

8/14 0 Oversail one course facings.

This is the correct method, and follows the usual custom, which is to measure the length by the height by the average projection for the common brickwork, and the length by the girth for the facings, measuring in addition all oversailing and moulded courses as "extra on facings."

½/16 6 1½ B. Gable and
8 3 Ex. to Red Bk. facings.

2/12 6 1½ B. add for back of verge.
9

9
4½
1 1½

2/12 6 ⅓ B. add for oversail.
9

2/12 6 Extra to red brick facing (girth
1 1½ of verge).

And I should, in this case, take the oversailing in one dimension (as follows):—

2/12 6 Extra on facings to plain oversailing verge, 3 courses deep, set all headers in cement.

1 Cutting apex untie to do.

2/12 6 Fair raking cutting in facings.

2/12 6 Rough cutting.
9

A. G. C.

A correspondent travelling in the West of England reports that, in consequence of the strike in Sweden, many lines of timber are in short supply, and prices rule higher. Stocks of red deals are lighter than they had been for some time, and quotations have grown correspondingly firmer. He further reports that supplies of slates are inadequate to the demand, and that there is difficulty in obtaining some of the favourite sizes. Local cement merchants complain that outside firms are offering cement at prices barely equal to cost, thus compelling local firms to reduce to unprofitable rates.

* * *

About 20 members of the Newcastle Society of Antiquaries assembled at Gilsland for the last country meeting of the season, the object being to view the excavations which have been carried out there under the superintendence of Mr. F. Gerald Simpson and Mr. J. P. Gibson. The site of the excavations, according to popular Arthurian legend always called the "King's Stables," is in reality that of a mile castle, which was slightly excavated in 1886. Mr. Simpson said the structure, the largest of its kind yet known on the line of the wall, was 80ft. square. These mile castles, as the name given to them betokens, existed at intervals of about a mile right along the wall, projecting from its south face. They had gates in their northern and southern faces and thus formed guarded passageways through the great barrier. The bolt holes in the centre of the massive gateways just unearthed show where the gates fastened. These gateways, a springer stone of one of which was discovered, had been half-walled up in later Roman times. Remains of buildings discovered within mile castles have hitherto been very fragmentary, but in that at Gilsland the foundations of two structures run along almost the entire east and west sides, occupying about half the area of the castle, and are of the same date. Any doubt that might have existed as to whether the Wall and mile castles were contemporaneous is put at rest by these excavations, as the two have been found to be bonded together. Objects of interest found include coins, pieces of plate armour, two carved gems from rings, fibulæ, pieces of pottery, including Samian ware, etc.

LEEDS CONFERENCE OF SECRETARIES FEDERATION OF BUILDING TRADES EMPLOYERS.)

At the annual Conference of Secretaries of the National Federation of Building Trades Employers of Great Britain and Ireland, which was held on Tuesday, Oct. 19th, at the Hotel Metropole, King Street, Leeds, Mr. Ernest J. Brown, President of the National Federation, took the chair, and the following gentlemen signed the muster-roll:—J. C. Addyman, Barnoldswick; Fred. W. Amphlet, Midland Centre; Geo. Astwood, Burnley; W. J. Barton, Nottingham; J. Cameron, Edinburgh; A. W. Chamberlain, Burton-on-Trent; T. Costigan, London; W. C. Creasor, Stockton-on-Tees; J. Davidson, Leeds; Edward Dean, Oldham; J. Denton, Barnsley; James Denver, Manchester; S. A. Dove, Leicester; Councillor England, Barnsley; John R. Hadaway, North Shields; J. Hague, York; Robt. Hall, Bury; Percy Hastings, London ("Builders' Journal"); W. H. Hope, Sunderland; Bertram B. Moss, Liverpool; A. Peers, Hull; Richard Richards, Newport (Mon.); Walter Rigby, Middlesbrough-on-Tees; J. G. Robertson, South Shields; Wilton A. Rycroft; Thos. Smith, Sheffield; John E. Sykes, Huddersfield; W. R. Thompson, Dewsbury; J. R. Vose, Bolton; and A. G. White, National Secretary. Apologies for non-attendance were intimated from:—J. Baker, Barrow-in-Furness; W. Bullen, Liverpool; H. Duerden, Longridge; S. Easten, Newcastle-on-Tyne; W. J. Forsdike, Sheffield; F. Grundy, Loughborough; R. Hollows, Wigan; W. Knowles, Grimsby; G. Macfarlane, Manchester; H. Oldham, Rochdale; W. Pollock, Kilmarnock; J. F. Reid, Lancaster; J. Tomlison, Preston; J. Tonge, Loughborough; and J. Wilkie, Dundee.

The President (Mr. E. J. Brown) said in his opening address, that he was glad to visit (for the first time) the celebrated city of Leeds, which was so easily accessible that he had hoped for an even bigger meeting than that which had assembled to discuss Federation affairs from the secretarial point of view. He was exceedingly glad to have the honour of presiding at a meeting of secretaries, because he realised very clearly that the secretaries have to bear the brunt of the work of their respective centres or associations, and that upon the manner in which that work is done the success of the Federation largely depends. He was very specially proud of those secretaries who are doing excellent work under difficulties. The work is comparatively easy and pleasant where the builders of the district are loyal and united; but he (the President) was very well aware of the disheartening effect of working under the opposite conditions. He and the secretary had engaged in missionary work in certain unorganised districts, and the truth was then forcibly borne in upon him that it is impossible to form and sustain organisation where there are no leaders, and that it is almost impossible to exaggerate the extent to which the organisation of a district depends on the energy and enthusiasm of the secretary. It was necessary for the secretary to have plenty of enthusiasm. Without it he would not be able to overcome the apathy and indifference that are so fatal to combination. The secretary must have full confidence (as the President has) that the Federation is going to be an increasingly powerful factor in industrial and economic issues that are of national importance. Even London is gradually coming round to this view. It had been found very difficult to persuade London builders that the Federation could be of any use to them; but he (the President) was glad to report that the interest London is now taking in the Federation is increasing every day. During his term of office as President, there had been but little trouble in the trade. He had enjoyed a year of peace, but by no means a year of inactivity. The Federation had been setting its house in order, and in particular had succeeded in establishing working rules and conditions that are likely to prove of immense value. Being now a considerable distance North, he took the opportunity of expressing his admiration for the high degree of organisation to which the North had attained. As a striking instance—rather astonishing to one accustomed to the somewhat invertebrate South—the builders of the North were solid in the determination not to tender for a job unless the quantities are provided. Here again London is backward, but that it is not altogether indifferent to the question, may be inferred from the fact [chronicled in last week's Journal] that a meeting of professional gentlemen had been held, at which the subject had been discussed at considerable length, and an important resolution was passed. It was a matter in which secretaries might do valuable work by maintaining and insisting upon the firm attitude that had been adopted in the North and in the Midlands. He was afraid that secretaries do not obtain much kudos for the work they do; but he was, nevertheless, sure that it was highly appreciated by the Federation. He looked forward hopefully to the time when funds will be more plentiful and secretaries better rewarded. Referring to "my own pet scheme"—the adoption of an official journal—the President felt that he need not dilate on that subject, as he had brought down from London with him Mr. Hastings, who would place before them some perfectly irresistible arguments. He (the President) felt that before sitting down he, being amongst secretaries, could not refrain from bearing witness to the excellent and heartwhole manner in which the National Secretary, Mr. A. G. White, does his work. The National Secretary was a model for all.

He then asked Mr. Percy Hastings to read a paper on "The Use, Interest, and Influence of the Official Journal." At the conclusion, Mr. A. G. White moved a hearty vote of thanks to Mr. Hastings for coming from London to Leeds, at the National Secretary's request, to read so important and valuable a paper as that to which they had just had the pleasure of listening. Mr. White again called attention to the first paragraph in the report issued by the Journal Committee, and presented and adopted at the last half-yearly general meeting. The paragraph is as follows:—"1. The Committee fully appreciate the valuable subscription support already accorded, but feel that it is essential to the prestige of the Federation and its branches that the Official Journal should be received and read by every member in every Association, therefore they are very desirous that the excellent plan adopted at Newcastle and Sunderland of purchasing the paper on wholesale terms and distributing it to every member, arranging their Association subscription so as to cover the cost, should be generally adopted as being the true way to make a big success of our Official Journal." There could be no question, Mr. White thought, that this recommendation showed the best way of extending the effective influence of the Journal, but how far the advice is practicable remains to be seen. This, however, is really a question of the Federation making good an undertaking into which it has entered. Now, said Mr. White, when a local association enters into an agreement with a trade union of operatives, it does so in the full intention, and with the fullest confidence, that every one of its members will honourably observe in both letter and spirit the terms of such agreement. The operative union in a similar manner relies upon its members to observe the agreement. Both sides rely entirely on the personal honour of their members to fulfil their obligations, and we all know that, speaking broadly, experience shows that such reliance is not misplaced. Further, relying entirely upon the personal honour of members, Federations have entered into conciliation schemes. In an exactly similar way this Federation has entered into an agreement with the "Builders' Journal," which thereby became our official journal. As to its material side, the agreement was based on the mutual benefit which would be likely to accrue to the parties through, on the one hand, the great increase of subscribers which the Federation undertook to do its best to secure, and, on the other, the increased advertisement revenue which the adhesion of the Federation membership was expected to make possible. Over and above the material side of the matter, the main object of the whole affair was to be able to say that our official journal spoke for, and voiced the opinion of 5,000 to 6,000 firms, representing the most responsible and the most honourable firms in all branches of this great industry, so that an influence might be created which would help to prevent, ameliorate, or remedy grievances of all kinds. The honour and the reputation of the Federation are pledged to secure a subscription from practically every member of it, or the objects which were to be obtained will not be obtained, and the whole agreement will not be kept. The honour of the Federation is the honour of every member of it, and therefore it is the duty of every member, be he general contractor or sub-contractor, be he personally interested in the subject matter of the journal or not, to do his part by subscribing for it, so that the Federation may make good its undertaking. "In my opinion," said Mr. White, "this question will be a test of the capacity of the Federation for practical work on a National scale, and upon its result will largely depend its future usefulness. It is evident that if the members fail to back up their representatives in a question like this, any future questions will be prejudiced by the failure, and that the representatives, in consequence, will hesitate to undertake any reforms requiring the support of the membership for their effective carrying out. If members realise that loyal support of their journal is a question of honour, there will be not the slightest difficulty in getting them to act accordingly."

Mr. Thos. Smith (Sheffield) seconded the motion. He thought the suggestions contained at the end of Mr. Hastings's paper were very businesslike.

The Chairman, in supporting the resolution, said that he hoped that secretaries and members would realise that they have a powerful organ to support their interests, and that they would make every legitimate use of it.

Mr. E. Dean (Oldham) made a practical suggestion as to a method of subscribing.

Mr. J. G. Robertson (South Shields) spoke enthusiastically of the value and interest of the Journal. "It is," he said, "a live Journal. It voices our opinions, and gives us information that we cannot get elsewhere."

The vote of thanks having been carried with acclamation,

Mr. Percy Hastings briefly returned thanks.

Mr. Thos. Smith (Sheffield) then read a paper on "The Mixed Clauses for dealing with Conciliation and Disputes which exist in Working Rules as Survivals from a period anterior to the National Scheme of Conciliation." The resolution which he proposed was as follows:—"That in view of the fact that the Conciliation Boards and the antecedary committee therein referred to, provide, or should provide, machinery for dealing with all disputes or questions which may conceivably arise between employers and operatives, it is desirable that, in all districts where Conciliation Boards have been established, that joint conferences should be held with the object of abrogating such existing working rules as provide alternate methods of settling disputes, but having regard always to existing provisions for dealing with disputes as provided in existing working rules, and also to the length of notice which either party may demand in specifically important matters."

The Chairman remarked that this was the longest resolution he had ever had to put. It was seconded by Mr. W. H. Hope, who said that within his own experience the supposed clashing, or apparent conflict, between association rules and the rules of the Conciliation Board, had created difficulties, the association rules being sometimes in need of interpretation in the light of the conciliation rules. He suggested, however, that as the meeting had not had an opportunity of reading and digesting Mr. Smith's paper [which had not been prepared in time for printing with the others], discussion on it should be adjourned.

Mr. Bertram B. Moss (Liverpool) said that to his mind the Conciliation rules were well-nigh perfect; but he was afraid that, in the nature of things, it was impossible that association rules and working rules could be made equally clear and definitive. If they could be made as perfect as Mr. Smith seemed to desire, there would probably be no need for Conciliation rules.

Mr. A. W. Chamberlain (Burton-on-Trent) said that his association had asked the operatives to consider the advisability of deleting some of the old rules in favour of new ones recognising and bearing reference to the Conciliation rules.

Mr. J. Davidson (Leeds) said that he had strongly advised his association not to abrogate existing local rules. To do so would be to destroy the machinery that was best adapted for the settlement of local disputes. There were so many peculiarities of local circumstances in various districts, that he thought any attempt to bring local rules into precise conformity with any set of general rules would be most undesirable. Indeed, in some instances that could be easily imagined, the effect might be absolutely disastrous.

Mr. Thos. Smith said that the idea in his mind was that the various rules should not be in conflict, and he certainly thought that this surely very desirable object could be attained without producing the disastrous consequences imagined by Mr. Davidson. Mr. Smith did not mean that working rules should be superseded by Conciliation rules, but that the respective rules should be brought into substantial and reasonable agreement, and not cross each other as they were apt to do when working rules had not been really brought up to date, but represented more or less perplexing survivals of a period prior to the National scheme of conciliation. All that he advocated was some uniformity of standard.

Mr. Edward Dean (Oldham) then read his paper on "Rules for Conciliation Boards."

Mr. Moss, answering Mr. Dean's question, "When does a dispute arise?" contended that a dispute does not arise until there is an absolute difference of opinion between the parties, and that before this condition is reached it is often possible to arrive at agreement without going to the Conciliation Board. As to Mr. Dean's contention that the Conciliation rules should include instructions as to how any party or parties failing to abide by a decision should be dealt with by the local association, Mr. Moss thought that the pains and penalties were wisely left undefined. Such matters were best left to the discretion of the association. The offence of the recalcitrant party might be either very serious or very trivial, and therefore any hard-and-fast rule as to what should be done to the rebel was unadvisable.

Mr. Davidson expressed the opinion that a dispute arises as soon as discussion of a matter is formally requested. With regard to the resolution proposed by Mr. Dean, to the effect that the conference should recommend the Federation to amend certain rules for the establishment and governance of Conciliation Boards, Mr. Davidson thought it unwise to put forward such general propositions without advancing cogent and specific reasons. He did not think that sufficiently cogent reasons had been advanced to justify the meeting in passing the resolution.

Mr. Fred W. Amphlet (Midland Centre) thought that most of the points that had been raised in both papers were frivolous. With regard to Mr. Smith's general contention, Mr. Amphlet was of opinion that instead of elaborating working rules, it would be far more convenient to consider them as being subsidiary to the machinery for settlement that was provided by the Conciliation rules. With respect to Mr. Dean's recommendation as to Rule 6—that in case of failure to agree, the seven days allowed for appealing to the National Board is insufficient, the speaker thought that, seeing the desirability of geting disputes settled as quickly as possible, the period allowed was ample. As to Mr. Dean's complaint that Rule 13 does not include instructions that amendments may be moved to a proposition on the actual dispute, he thought that closer examination would convince Mr. Dean that the rules as to procedure provide for amendments. He thought, indeed, that the rules generally were ample for all purposes, and that therefore Mr. Dean's resolution was superfluous.

Mr. Smith explained that for his part he had by no means contended that more disputes should be thrown on to the overworked hands of the Conciliation Boards; but, at the same time, he contended that inefficient working rules should not be employed for settling and finishing disputes.

Mr. Moss agreed that if any revision was necessary, it was the local rules that required to be altered, in order to bring them into line.

Mr. Dean said that actual disagreements having arisen upon the points he had raised, he certainly thought it necessary to seek from the National Federation enlightenment on points that had been found to be somewhat obscure.

Mr. Moss: Surely it is a reflection on our intelligence to ask the National Federation to interpret the rules.

Votes of thanks to Mr. Smith and Mr. Dean having been carried with applause, it was resolved that the discussion of Mr. Smith's resolution should be resumed at the next conference of secretaries, Mr. Dean having withdrawn his resolution.

Mr. A. G. White's short paper on the working of conciliation boards having been, at his request, taken as read,

Mr. W. H. Hope remarked that this paper, like everything that the National secretary undertakes, is carefully and thoroughly and philosophically thought out. He was a well-spring of wise counsel; and it had come within Mr. Hope's experience that the statesmanlike advice proceeding from the National secretary had created, in the minds of local authorities, a great respect for the National Federation.

Mr. Fred. W. Amphlet, adding his tribute to the value of Mr. White's paper, said that, in his experience, representatives of the operatives were too apt to go to the Board with their minds made up before hearing the evidence. Both parties should go into conference with unbiassed minds, prepared to do their best in the interests of the industry.

Mr. W. H. Hope (Sunderland) read a paper (which had not been printed, but which we shall be glad to publish when space allows), on the subject of sub-contracts. It was supplementary to the valuable paper on a builder's general contract, which was read by Mr. Hope at the preceding conference.

At the conclusion of the paper, the Chairman said that he should like to have the pleasure of proposing a vote of thanks to Mr. Hope, to whom he almost felt himself to be under a personal obligation, because it happened that the ideas thrown out by Mr. Hope would be of great service to him (the chairman), as they no doubt would be to many others who had heard them.

Mr. W. R. Thompson (Dewsbury) had much pleasure in seconding the vote and in endorsing the observations of the chairman. He was sure that Mr. Hope's elucidation of the subject would be of great benefit to the industry, because, as most of those present were aware, Mr. Hope had made a special study of the subject. He might be allowed to mention that in Yorkshire they had a useful form of sub-contract which owed much of its success to the valuable suggestions that had been made by Mr. Hope, to whom it had been submitted for revision. With regard to Mr. Hope's recommendation that accident insurance policies should be taken out in the joint names of the contractor and his sub-contractors, Mr. Thompson hardly thought it necesary, or in all cases expedient, to have a joint policy.

Mr. Hope, in reply, said that it was above all things necessary "to insure that the man is insured," to make insurance doubly sure. In the absence of the safeguard he had suggested, the contractor could never be certain that the sub-contractor's policy had not been allowed to lapse.

Mr. James Cameron (Edinburgh), when invited to read his paper entitled "Past Conferences—some Impressions," said that as the paper had been printed, and as time was pressing, he would ask that the paper should be taken as read. He would like to suggest that proofs of the papers to be read at future conferences should be posted to those who intended to be present at the meetings, so that the matters brought forward for discussion could be properly digested.

Mr. A. G. White said that there was no question as to the desirability of doing what Mr. Cameron had suggested. The difficulty was that it was impossible to know, many days in advance, who was coming to the conference. To send proofs to all who were entitled to be present would involve unnecessary expense, as most, if not all, the papers would ultimately be seen in the official journal.

The Chairman thanked Mr. Cameron for the trouble he had taken in writing his excellent paper, which would certainly be read with interest.

Mr. W. J. Barton (Nottingham) asked that his "Note on the Inter-trading Rule" should be taken as read, but the Chairman said that as it was so very short, the meeting would no doubt prefer that Mr. Barton should read it. Mr. Barton's paper is as follows:—

A NOTE ON THE INTER-TRADING RULE.

I have felt for some time that the inter-trading rule as recommended by the National Federation is too strict according to the present wording, and thus causes unnecessary opposition to its acceptance in many quarters, especially from the sub-trades.

Also from what I can learn, where the rule is in use, it is not enforced as drafted, but modifications are allowed to the members.

Now, would it not be better to have a rule which avoids opposition as far as possible, and also more nearly accords with the actual practice?

The second paragraph of the rule appears to be all right, but my objection is to the first paragraph, which bars members from giving or taking *tenders* to or from an outsider.

Sub-contractors especially resent this, and say they cannot consent to their opportunities of obtaining business being thus curtailed.

I understand that in practice, a member is allowed to give or take tenders to or from anyone, but must endeavour to induce the persons to join an association before entering into a contract for the work for which he has tendered.

In order to obtain the opinion of my fellow secretaries on this point, I propose (if the chairman consents) putting the following resolution:—

"This Conference of Secretaries of Building Trades Associations recommends that the first paragraph of the inter-trading rule should read as follows:—*Inter-trading.*—Members shall not enter into contracts with or otherwise employ or deal with regular employers in the building trades unless such employers are members of this or a kindred Association affiliated to the National Federation of Building Trade Employers."

P.S.—On sending the above to Mr. White, he kindly wrote me pointing out a weak point in my remarks, namely, that a tender might be converted into a contract by simple acceptance and stamping the offer. To meet this objection, I suggest that sub-tenders should contain a note to the effect that "This estimate (should it be accepted) is subject to a written contract, containing all usual and proper terms, including compliance with the inter-trading rule of the Building

Trades Association of this district, being signed by the parties, and shall not be taken as in itself constituting a contract."

Mr. Amphlet commented on the difficulty of enforcing any rules upon the subject that might be thought too stringent.

Mr. Smith said that the Sheffield rule was not quite so strong. On the wall calendar issued by the associations there was a notification to the effect that builders are not expected to give or take tenders from those who are not members of the association.

Mr. A. G. White thought that the weak point about Mr. Barton's suggestion was that probably contractors could not always be relied on to insert it in their conditions.

Mr. A. W. Chamberlain approved of the suggestion.

Mr. Moss said that he was strongly opposed to any sudden or violent enforcement of the inter-trading rule, because it was likely to do more harm than good by scaring away those who might be susceptible to a more gradual approach. The object should be to show the advantages of the rule—members should be educated up to it.

Mr. Cameron said that the attitude advised by Mr. Moss was precisely that which was being adopted in Edinburgh. The practice was there introduced as a recommendation, and in that form it was undoubtedly doing a certain amount of good.

The Chairman said that Mr. Barton would no doubt see the wisdom of Mr. Moss's advice. At present it would be better if each association acted within its own discretion.

Mr. T. Costigan (London) did not feel at liberty to say—and in fact he was not in a position to state definitely—what was the attitude of London with regard to the inter-trading rule.

Mr. A. W. Thompson, president of the Yorkshire Federation, read a short paper [which we hope to print in a future issue] on "The Position of the Sub-trades in Various Towns as Regards Membership of the Builders' Association," in which he urged the importance of doing all that is possible to bring in the sub-traders—who sometimes have organisations of their own, and are sometimes unorganised—so as to bring about consolidation into one strong and united body that shall represent all sections of the industry.

Mr. Moss was grateful for Mr. Thompson's paper, because it was evident that the National Federation had not paid a sufficient amount of attention to the sub-trades. He suggested that Mr. White should send to secretaries a circular requesting information as to the position of the sub-trades in each district, and as to the best means of bringing them all into the National Federation.

Mr. Amphlet pointed out a difficulty with regard to associations that, possessing but fifteen or twenty members, were apt to be feeble and inert.

Mr. Thompson said that the difficulty might be overcome by grouping small towns together.

The Chairman remarked that he had heard Mr. Thompson's paper with great pleasure, and was glad to say that London was beginning to put its house in order in the way indicated. It was one of its ambitions to get traders and merchants into the association.

Mr. A. G. White asked that his paper on "Building Trade Organisation in France" [part of which was printed in last week's journal], might be taken as read. It was, he thought, desirable to know what builders are doing in the sister country. The Federation had sent him to France, and he was glad of this opportunity of showing that the expenses of the journey were not thrown away. [See next column.]

Mr. Chairman thought that international inter-communication was both pleasant and profitable. It had been found so in the case of our friends the Belgians, with whom very charming visits had been interchanged. Mr. White's paper contained a great deal of valuable information, and was in itself a complete justification of his visit.

Mr. E. Dean read a paper on "A National Insurance Scheme," in which he raised the question of the desirability of suggesting to the Council the creation of a National scheme for insurance of members against all the usual risks.

Mr. Hope thought that such a scheme was beyond the scope of the Federation, and was almost equivalent to the municipal trading that was held in such abhorrence by the Federation.

Mr. Amphlet could not admit the validity of Mr. Hope's comparison. In the Midlands the associations had launched a scheme which gave a clean policy without undue restrictions, and at remarkably low rates; and he saw no reason why the movement should not become national.

Mr. Davidson thought it should be possible to devise some practicable means of placing insurance on a national basis, on the lines not of municipal trading but of collective bargaining. In Yorkshire the rates would have been much higher but for combination of interests. He suggested the adjournment of the discussion.

Mr. Dean, replying, said that his idea was not that of collective bargaining, but of amalgamation of the various offices; yet even collective bargaining would be better than vacillation between the various offices.

Mr. White supported the proposal for adjournment, which was adopted.

Mr. J. R. Vose (Bolton) introduced some business of a semi-private character, upon which he sought and obtained the advice and experience of his fellow-secretaries.

Mr. Moss then made a proposition with regard to the means of distributing the official organ. This having been carried unanimously, a hearty vote of thanks was accorded to the chairman, who, in acknowledging it, said that his visit to Leeds would always be to him a very pleasant remembrance.

It was decided, on the proposition of Mr. Hall, seconded by Mr. Dean, that the next conference should be held at Manchester.

At the conclusion of the conference, the visitors were entertained to tea at the invitation of the Yorkshire Federation, to whom Mr. E. J. Brown tendered the thanks of the guests for a splendid example of the hospitality for which Yorkshire is renowned the world over. Mr. Thompson briefly replied.

[A report of the meeting, somewhat amplified, and including all the papers read or presented at the meeting, is being prepared for distribution in separate form. Most of the papers will also appear in due course, as room can be found for them, in the pages of the "Builders' Journal." Any corrections required should be sent to the National secretary.]

BUILDING TRADE ORGANISATION IN FRANCE.*

By A. G. White.

(Concluded from page 305, *No.* 767.)

The workmen also boldly declare war against the State, they say: "Thus the working class does not confine its action to struggling directly against employers, it struggles also, and always directly, that is to say without recourse to parliamentary action and the system of participation in the work of government by means of representatives, against the State which is the defender of the employer class, and its obliged supporter. So the workers' action, besides the assault it makes against the power of the State, with the object of causing it to retreat, aims at the same time at diminishing its oppressive power until it disappears entirely." Their eventual aim is stated to be a "general strike," which shall make the workers masters of the situation, and enable them to establish a Communistic State. They say that then, "the cohesive centres will be the corporate federations and syndicates of workers, who will carry on all useful functions now devolving on the public and communal authorities." The expropriation of the capitalist class is to follow.

Such is the programme publicly announced by the larger part of the working classes in France, including those in the building trade. Is it to be wondered at that the employers have been very busy the last few years forming defensive syndicates and federations, and that they have a total membership of over 20,000?

(For an independent contribution which confirms the foregoing definition of the objects of the French Unions (or some of them), see the "Contemporary Review" for June, 1909.)

The continual rise in wages due to these agitations has of course brought about an increase in the cost of materials for building.

In the face of these facts, the isolated employer was helpless, the ordinary employers' association could do nothing to resist the increased cost of production. Not being companies or corporations they could not enter into contracts, and had to submit to the demands of the merchants for higher prices. In consequence of this situation, they formed the Professional Association aforesaid, which under the company law would enjoy full liberty of action.

The Association's programme is stated to be:—

1. To make contracts with furnishers of materials.
2. To re-organise their workmen.
3. To establish general works fitted with the requisite mechanical appliances for masonry work.
4. To study and put into operation mechanical appliances for transport, hoisting and setting all materials.
5. The utilisation of material acquired and stored in common.
6. The regulation of the output of its members.

"These various combinations are intended to diminish, as far as practicable, the general expenses, regulate the cost of materials, save hand labour by means of all kinds of labour-saving devices, in order to make good, wholly or in part, the increased cost of labour, and the various other charges which have been imposed on industry." Part of this programme is already in course of realisation, viz., items 1 and 3.

Workmen's Organisations in France.

I have no data for any exhaustive review of the workmen's organisations, but the following facts extracted from a report by M. Leon de Seilhac, permanent delegate of the Social Museum, together with the preceding particulars, which, though given by the Employers' Association, are by them quoted from workmen's publications, will give some idea of the position.

The General Federation of Workers is composed of labour exchanges and of federations.

Labour exchanges exist in every industrial town, and appear to fulfil a similar function to what are called Trades Councils in England. Federations of a single trade or industry are as yet few in number. The most important are "The National Syndicate" of the railway employees having 45,590 members, the Building Federation with 40,000, the Textile Workers' Federation with 20,000, the Miners' Federation with 30,000, the Metal Workers' Federation with 14,000, the Mechanics' Federation with 5,000, the Tobacco Workers with 9,000, the Leather and Skin Workers with 8,000, and the Printing and Bookbinding with 10,000.

The federations of the building, metal, and leather trades are revolutionary in their character and objects, and object to accumulate large funds; indeed, they reproach the English Trade Unions for having too much money.

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*Concluding portion of a paper presented by Mr. A. G. White, National Secretary, at the annual Conference of Secretaries of the National Federation of Building Trades Employers of Great Britain and Ireland, held at the Hotel Metropole, King Street, Leeds, on October 19th.

The remainder are reformers, have accumulated funds, and are careful and prudent in their policy.

A contest is in progress for ascendency between the two groups just mentioned.

The revolutionary federations are seeking to overwhelm the reforming federations by sheer numbers, and by insisting on methods of representation and organisation which will tend to absorb the latter in the former.

There are other phases of the struggle, such as the attitude of workers to the militarism of the Continent and their tendency to an anti-patriotic attitude, but these do not interest us much.

The chief factor of interest to us is that the revolutionary character of the building trades unions profoundly influences their point of view towards their employers, and is responsible for the unreasonable way in which they insist on an immediate concession of ameliorations which have only been secured step by step in this country, regardless of the dislocating effect which violent changes in hours of work and rates of pay, such as they demand, cannot fail to have on the prosperity of the industry by which they live. The majority apparently entirely fail to see the potent effect of a big bank balance in securing objects. One of the delegates, M. Coupat, told his confrères, "Pay high contributions. The question of big funds is important. You reproach foreign workmen with having too much money, but if money does not count, don't turn to them so often for help. It is because of money that the English workmen have a 54-hour week since 1871. They would not have obtained such results if they had only had infected communist pots like those I have had regret in seeing."

Again he says: "The workers in the same town pay small contributions to their syndicate, but pay large ones to the Societies for Mutual Help, which exist under the aegis of the employers. There is a million of workers who go to the Mutual Help Societies for what they cannot find in their syndicates—viz., out of work benefit and sick benefit."

It is evident that the character and functions of trades unions in France, especially in the building trade, is very different from and we must think inferior to those we know over here.

In connection with this matter, the following particulars are given by the Board of Trade Gazette for July, 1909:—

Number of unions of the building trade in France, 826.

Membership of same, 87,423.

Proportion of members to total employed in the trade (1901 census), 16.40 per cent.

Workmen's Compensation in France.

The following, taken from pamphlets issued by the Building Trades Employers' Associations in Paris, will give some idea of what French legislation in regard to workmen's compensation has brought about in that country.

The object sought by the makers of the law governing workmen's compensation is apparently fully attained, the wide interpretation given to the words, "by reason of or in connection with work," by the Court of Appeal causes the law of 1898 to benefit not only all accidents in connection with the task assigned to the workman who has become a victim, but also accidents which happen in a shop or works, even though they have no direct connection with the work, from the moment a workman arrives and places himself at the disposition of the foreman until the moment he has left the works and recovered his liberty. It has even been decided that a place 1,500 metres away from the spot where the workman was working constituted "an extension of the works."

Consequent upon this very liberal interpretation of the law, all accidents connected with work receive indemnity. Subsequent legislation in 1902 and 1905 has, however, produced most unfortunate results due to two distinct causes, one due to defects in the law of 1898, aggravated by the effect of the law of 1905, and the other due to the manner in which the laws have been interpreted by the magistrates. The defects referred to have given rise to innumerable abuses, such as simulated injuries, unduly prolonged disablements, exaggerated medical fees and legal expenses.

The interpretations referred to have resulted in an indemnity tax for permanent incapacity of the injured where the actual functional incapacity does not cause any professional depreciation.

The consequences are seen in an increase in insurance rates in 7 years of at least 50 per cent., and in some industries 100 per cent. and more, and in the demoralisation of a daily increasing number of workmen by the contagion of bad example and the facility for fraud contained in the law, which act as incitements to malingering and to idleness.

The cost of resisting the abuses is so great that they are rarely contested.

Particular complaint is made of the provision by which, if incapacity lasts more than 10 days, indemnity becomes payable as from the first day of incapacity. Statistics are given for various mutual insurance companies, by which it appears that between 1899 and 1906 the number of temporary incapacities per million francs of wages insured has risen from 74.6 to 145.54, and their cost from 5.034 francs to 11.073 francs per case. The increase has been a progressive one from 8.03 per cent. in 1904 of workmen assured, to 9.61 per cent. in 1905 and 12.03 per cent. in 1906.

The duration has increased from 17 days in 1899 progressively, to 23 days in 1907, an increase in lost time of 35 per cent. in 7 years.

Since the law of 1905, the number of accidents of more than five days and less than 11 days incapacity has continually decreased, showing a tendency, each year more accentuated, to unduly prolong the period of incapacity in order to obtain half wages for the four first days, which the law of 1905 prescribes in cases where the incapacity exceeds 10 days.

There does not appear to be any means of preventing this abuse. Similarly there is a formidable increase in the cost of medical and pharmacal expenses, which have to be also indemnified. The workman has the right to choose his own doctor and chemist, with the result that a class of practitioners has arisen who lay themselves out to exploit workmen's accident cases, and they make an excellent thing out of it for themselves. They employ touts to frequent works and jobs and secure them cases. They prolong the cases for their own and the workmen's advantage, piling up the cost of medicaments, visits, massaging, electric fomentations, ray examinations and the like.

No resistance can be offered because it is generally impossible after the event to say whether the things charged were necessary or not, and as the injured person is usually induced to sign in advance a number of blanks of attendances in a register, there is opened up a wide field for charging attendances which have never been made. In most cases the medical expenses exceed the value of the indemnity paid to the injured person. For example, in a case of a simple contusion of the thumb the indemnity came to 85 francs, but the medical, etc., expenses amounted to 124 francs. Numerous other examples are given. The like remarks apply to the pharmacal expenses. In the case of a workman having a contusion to the stomach, his indemnity was 162 francs, and the chemist's bill was 183 francs. Medical men of repute are scandalised at the way in which these medical exploiters teach the workmen to rob their employer or his insurer, by showing them how to simulate injury, but they appear to be powerless to prevent these abuses.

There are other abuses such as those connected with judicial fees and experts employed judicially, and the too liberal interpretation of the law as to the diminished earning capacity in cases of partial permanent incapacity.

It is said that the same abuses exist in Germany, and to a like extent. When we consider that insurance rates for workmen's compensation in France are, to begin with, much higher than in this country, it will be apparent that our French confrères have ample ground of complaint. Unfortunately our turn is probably coming. Since in our last Workmen's Compensation Act some of the features common to French law were introduced into our law, and a great augmentation of insurance cost has followed its application, the end of this augmentation is probably not yet in sight.

Apprenticeship Question.

The question of apprenticeship is considered to be a serious one in the French building trade.

The Revolution destroyed the then existing guilds and associations, and left every man a law unto himself as respects the training of apprentices.

The result has been that what is every one's business is nobody's business, and as a result, apprenticeship has decayed in France.

In addition, the following causes are alleged to contribute to the scarcity of apprentices:—

1. The desire of parents to see their children earning at as early an age as possible.
2. The effect of certain legal enactments in regard to hours of adult workers, and the forbidding of young persons who work shorter hours being employed in the same places as workmen whose hours are longer.
3. Increased use of machinery and subdivision of labour.
4. Tendency of masters to use the apprentice for other things than those specified in the indenture.
5. Objections by workmen's societies to the making of apprentices.
6. No means of controlling refractory apprentices.

Although to some extent schools intended for the training of apprentices exist, they are quite inadequate to the purpose, and the cost of the training is excessive, amounting on an average to 500 francs per year per pupil.

It is said there are 500,000 young persons employed in industry, only a small percentage (perhaps 10 per cent.) of whom receive any school training for apprentices; but if the whole of them were so trained, the cost would be about 250,000,000 francs per annum. The remedies which are suggested by the President of the Masonry Contractors of Paris, M. Villemin, are as follows:—

He suggests that a better scale of pay in the earlier years might be given, that the law as to apprentices and their indentures might be perfected, and that employers might be restrained from abusing the position.

The most novel and important suggestion is that it is the duty of society not only to care for infants, see that a primary education is given to each child, and that each youth serves his country for a term in the army. These things are admitted; but he asserts that it is the duty of society to train every young person in some department of industry, commerce or whatnot, so that he shall be rendered capable of earning his own living and be a productive unit of the nation.

He therefore considers that State supervision should not cease when the child leaves the primary school, but should be continued until the child has served an apprenticeship.

He would begin by having in the primary schools half the time devoted to three classes of practical instruction, comprised as follows:—1, Manual training; 2, commercial training; 3, liberal arts training. The training in each to be on general lines calculated to ascertain the disposition and capabilities of the children. Such a training should inculcate in the child the habit and love of work by teaching him to use his hands, to look at things from the practical side, and dispose him towards the study of what is likely to be necessary to him in later life and take away the idea that to go to a manual occupation on leaving school involves degradation.

Secondary education on similar lines should be also provided from pupils selected, judiciously, according to the aptitudes shown in the primary schools.

Finally the apprenticeship proper in a workshop, commercial house or otherwise, should be obligatory.

He would raise the primary school age to 14, and prescribe secondary schooling until 16, with apprenticeship of 3 to 5 years to follow. He would place by law the obligation of organising a system of apprenticeship and of carrying it out on the shoulders of the employers and require every employer to bear his share of the cost, as a tax on industry, he bases this suggestion on the ground that a workman is, practically speaking, a machine for production, and as such should be provided and trained by the employer for the same reason that the latter purchases and maintains the machinery which takes the place of manual work.

He further maintains that employers are the proper people to prescribe and direct such training, and that apprenticeship can only be effective if carried on in, on or about the works.

For this purpose he would make use of the Chambers of Commerce and employers' associations formed into corporate bodies 'ad hoc.'

They would have powers conferred enabling them to—

1. Fix the number of workmen required in the respective branches of commerce and industry.
2. Fix the number of apprentices required each year to replace workers dropping out.
3. Fix the number to be provided by each industrial or commercial unit.
4. Fix the amount of the annual tax for the training of apprentices based upon the average cost of training.
5. Study the best types of apprentice indenture.
6. Submit these types and supervise their application.
7. Discuss and settle with localities the possibilities in the way of courses of theoretical teaching and the remuneration therefor.
8. Study and prepare all agreements relative to this question, with the State, the counties, districts and Chambers of Commerce.
9. Study, supervise, and if need be, create ateliers for apprenticeship.
10. Pass certificates for finished apprentices.
11. Indicate, after competitive examination, those apprentices who, having obtained their certificates, were worthy to receive a superior practical and theoretical instruction.
12. Receive the part of taxation allotted for their use, and to direct and supervise its expenditure.

Mr. Villemin considers the certificate of apprenticeship under such conditions as affording a guarantee for the good behaviour of the apprentice, and as overcoming the difficulty at present felt in carrying out the agreement where an apprentice is refractory. Such in broad outlines is the scheme propounded by M. Villemin, and it must be admitted that it looks practical and should be much less costly than any State system of apprentice schools.

I have referred to it because I believe the time is not distant when some general action will be required in England to secure a proper system of apprentice training, and I certainly think in the building trade that time has already arrived.

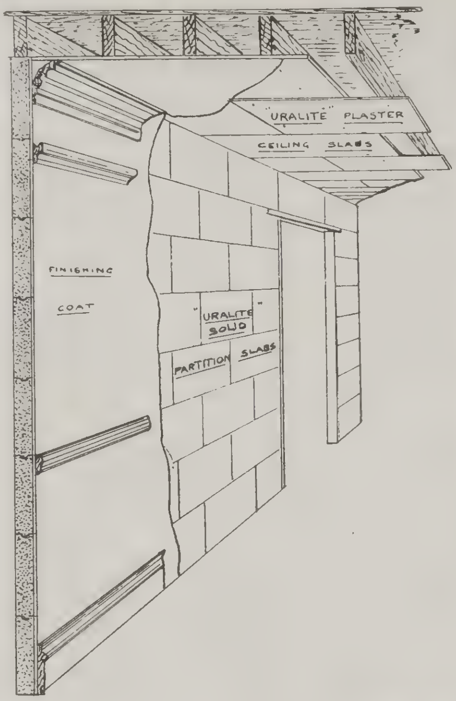
In conclusion, it appears from the documents which I have considered that our brethren of the building industry in France are taking themselves and their organisations very seriously, the work done is mostly voluntary, and a man is sometimes president of one part of the federation and secretary of another part; for example, the president of the Paris Masons' Association is, or was, secretary of the French National Federation.

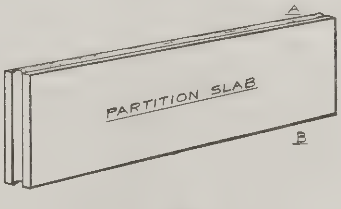
Their fees are remarkably low, about 1-6th of ours, and this no doubt is due to the voluntary work just mentioned. Probably as time goes on they will find as we have done that the work outgrows voluntary effort, and then the cost will have to increase. In the case of the Professional Association, for instance, a paid secretary must be a necessity.

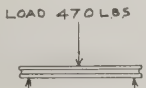
Trade and Craft.

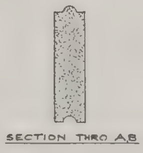
Uralite Co.'s New Partition and Ceiling Slab.

The fireproof nature of Uralite and Asbestone manufactured by the British Uralite Co., 16, St. Helens Place, E.C., is already well known to our readers, and it will interest them to learn that this company have now, after exhaustive tests and experiments, placed upon the market a new partition and ceiling slab, which, while possessing the fireproof qualities of uralite, is at the same time capable of erection without framing or supports These slabs are made from a high-quality plaster, combined with asbestos reinforced in all directions by very strong fibres, thus forming an ideal composition for slabs which are used for so many purposes and under such varying conditions. Some idea of the strength of the new product may be gathered from the following figures, these being the result of a series of tests carried out at the Engineers' Laboratory, King's College, London:—Tested as a beam 7½ span, the average breaking strain was found to be 293.6lbs. per square inch, while the crushing strain was 421lbs. per square inch.









Being partly composed of asbestos, the slabs are fireproof to the highest degree, whilst their semi-fibrous nature renders them sound-proof, thus making them invaluable for the division of rooms or cubicles where a thin partition is necessary to economise both in floor space and cost.

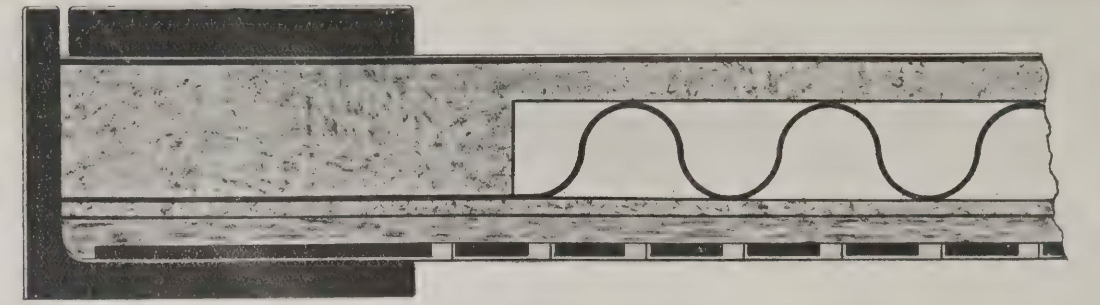
As will naturally be concluded, they are excellent non-conductors of heat and cold, thereby greatly reducing the cost of maintaining rooms, cold stores, etc., at an equable temperature.

These slabs are also proof against the attacks of rodents; and as they are constructed without the use of reeds, there are no cavities to harbour vermin of any sort.

Erection is most simple and rapid; and whilst the amount of wet plastering required as a finishing coat is reduced to a minimum, when completed an absolutely rigid partition is assured.

The "Checkfire" Doors.

We are informed that the "Checkfire" doors, as manufactured by the "Checkfire" Door Co., Tutaport Works, 2, Lonsdale Road, Kilburn, N.W., are now, after having successfully passed all the official tests, accepted by the Fire Offices Committee, and consequently by all the insurance companies. The following very succinct description of the "Checkfire" doors will, if read in connection with the accompanying illustration, which shows in section the exact dimensions of the various parts, fully explain the construction:—The door surface construction is fixed in an angle-iron frame 2ins. wide by 1½ins. deep by 3-16ths in. thick. One face consists of No. 19 S.W.G. sheet iron, adjoined by a 3-16ths in. sheet of asbestos composition, after which is a sheet of horizontally corrugated iron, No. 25, S.W.G. Following the corrugated iron is a 3-32nds. in. sheet of asbestos composition, followed in turn by a 5-32nds. in. sheet of asbestos slate adjoining the other face of the door, which consists of an iron plate of No. 14 S.W.G. perforated by holes 7-8ths. in. by 3-32nds. in. The whole is secured to the angle iron frame by means of an iron cover strip 2ins. wide and ¼in. thick, placed on the non-perforated face of the door and riveted through. Three iron strap hinges 1¾ins. wide by 5-16ths in. thick are riveted across the entire width, one in the centre, and the other two 9ins. from top and bottom respectively. The door is fitted with a lock. The door thickness at frame is 1½ins., and the thickness between the metal face sheets is 1in. For doors of dimensions not exceeding 6ft. by 2ft. 9ins., only two strap hinges are fitted. When made in two leaves, each leaf is fitted with a bolt at top and bottom, and one is fitted with a lock, and latches are provided for all doors. The rebates into which the doors are fixed are not less than 2¼ins. It is hardly necessary to add—what, indeed, is self-evident—that the "Checkfire" door is designed upon well-thought-out and thoroughly scientific principles. Theoretically, a door constructed in this way promises the utmost fire-resisting efficiency, and the promise has been completely fulfilled in practice, these doors having emerged triumphant from the severest tests. It will be observed that the door is of exceedingly light weight. It is a total thickness of only 1in. and half of this is accounted for by air-spaces. Moreover, the door is hung in plain brick rebates, and, the usual iron framework to the opening being thus dispensed with, a saving in cost and labour is effected, buckling through bulging of the frame is prevented, and the unpleasant creaking and grating noises caused by a door moving in an iron frame are avoided. The system of fixing adopted by the company is singularly easy and effective. All that is necessary is to cut rough reveals in the brickwork, and press the door home on to a bedding of cement, perfect adjustment being obtained without the least planing or trimming of either door or opening. The door is thus made to act as its own mould, and a perfectly smoke-proof joint is obtained. Among recent users of "Checkfire" doors are: H.M. Office of Works, for Ocean House and the Custom House; the



SECTION OF THE CHECKFIRE DOOR.

London County Council, for Bexley Asylum; the County Asylum, Wakefield; the Cinematograph Hall, Cardiff; and the Alhambra Theatre, Openshaw. For banks, hotels, and similar buildings, the doors may be rendered of decorative appearance; but their strong recommendation is their high efficiency.

Automatic Continuous Water Boiler.

Messrs. Richard Crittall and Co., 197, Wardour Street, W., point out that while it is possible to make a perfect cup of tea by boiling the water in a kettle or urn, it is probable that the tea will be unsatisfactory owing to water not quite boiling or over-boiled being used. Their automatic continuous water boiler, however, not only overcomes these difficulties, but has many other advantages. All working parts are outside the boiler, removed from the action of heat, and easily accessible for inspection. Every boiler is tested under working conditions before leaving the works. A large cleaning door is provided, through which every part of the interior may be cleaned, and the boiler refitted ready for use within two hours by an intelligent fitter or plumber, without the removal of the boiler. The boiler will supply boiling water at the rate of three pints per minute. Cold water is automatically admitted to the boiler in direct proportion to the amount drawn off. The gas supply is separately controlled, being instantly reduced when the water boils to consumption of 8ft. of gas per hour, and increased only sufficiently to heat the equivalent of the water used. The boiler is coated with non-conducting composition wired on. All parts are made to standard patterns, and replacements can be supplied by return of post. The boiler is provided with the following fittings:—Safety valve, gun-metal, enclosed type, with easing lever to meet Board of Trade requirements; dial pressure gauge and syphon to indicate exact pressure in boiler; water gauge fittings to indicate water level; interlocking device to prevent the gas valve being opened until water is turned on.

HOUSES AT PARKLANGLEY, BECKENHAM, KENT.

An independent and unusually dignified essay in town-planning has been made at Parklangley, Beckenham, where Messrs. H. and G. Taylor, the owners, have laid out an estate of about 700 acres. Mr. Reginald C. Fry, of Clifford's Inn, the architect, has grouped his artistically designed houses round a commonly accessible shopping centre. An avenue, 1¼ miles long, runs from east to west of the estate, very many tennis-courts have been formed, and the interests of motorists, cyclists, and golfers have been studied. A fully illustrated booklet, in which the houses are described and illustrated, shows a number of elevations that are so well diversified in design that they seem to have only one characteristic in common—their decided charm. We reproduce illustrations of two houses on pages 318 to 321 of this issue.

The portrait of the Lord Mayor-Elect of Bristol, appearing in our last issue was published by the courtesy of our contemporary "The Bristol Observer."

Federation News.

BARNSLEY ASSOCIATION.

Secretary: J. Denton.

The Barnsley Federation held their monthly meeting on Wednesday, October 13th, Councillor G. Haigh, the president, occupied the chair, and was supported by thirteen members. The usual preliminary routine of business having been concluded, special attention was given to important correspondence. A letter was read from Mr. A. G. White, the National secretary, containing valuable suggestions towards the settlement of a difficulty between a Federation member, a non-federated master, and an apprentice transferring his services before the completion of his apprenticeship. The matter has been already reported in the "Builders' Journal," of September 22nd. Mr. White's suggestions were very favourably received and commented upon, as opening out excellent new suggestive ideas of solving a difficulty after the case had been practically given up as hopeless. The incident affords yet another direct proof of the valuable assistance the "Builders' Journal" renders through the medium of the secretaries' reports being carefully read by the right people.

The National Reserve Fund received attention, a special levy being made and promptly responded to by the various members generally.

A letter from the National secretary was read, containing suggestions and arrangements from the Journal Committee of the National Federation, re the furtherance of the influence of the "Builders' Journal." The suggestions were favourably received, and several copies of the Journal were distributed among the non-subscribing members by the secretary.

The secretary was instructed to attend the Secretaries' Conference held in Leeds.

The forthcoming municipal elections were next discussed, prominent members of the Federation being specially urged to allow themselves to be nominated as candidates. Each member, however, urged the ever-ready excuse "stress of business," and declined with thanks. The Barnsley Federation, nevertheless, is not entirely unrepresented, as included in its membership are two town councillors and two urban district councillors.

A meeting of the Executive Council of Tyne and Blyth District Federation was held at the Hotel Metropole, Newcastle-on-Tyne, on October 8th, Mr. W. T. Weir, president, in the chair, when representatives were present from the different local associations.

Tyne and Blyth District Building Trades Federation.

The minutes of the Executive Council meeting held on June 17th, 1909, were signed by the President as correct.

A report was given upon the annual meeting of the Tyne and Blyth District Conciliation Board, and correspondence was submitted which had passed between the employers and operatives with respect to the interpretation of rule 2 of the Conciliation Board rules, providing for trade matters being dealt with by trade committees. The action of the secretary in respect to the latter was confirmed.

The question of appointing various trade committees was considered, when it was pointed out that it would be advantageous to have standing committees for the district, and representing the different branches of the trade, to deal in the first instance with the disputes affecting particular trades. After discussion, it was agreed, on the proposition of Mr. J. T. Armstrong, seconded by Mr. Ferguson, to appoint trade committees, and that the following should be the employers' representatives, and that the operatives should be invited to elect a similar number upon the committees. Bricklayers: The President (Mr. W. T. Weir), Messrs. R. Heslop, Geo. Cocks, Brown, Leighton. Joiners: The President and Messrs. S. Easten, W. Foster, J. Simpson, J. T. Armstrong and J. Pelton. Stonemasons: The President, and Messrs. J. Lant, J. Simpson, Fairbridge and W. Gray. Plasterers: The President and Messrs. W. Ferguson, J. Niven, T. Anderson and P. Erskine.

The secretary reported that the agreement for working rules with the N.A.O.P. had been signed by all parties concerned. It was decided that a supply should be obtained and a copy forwarded to each member.

The question of the remuneration of the organising secretary was considered, along with his report, and it was resolved unanimously "That the Federation pay the organising secretary the sum of five pounds in payment of his services for the years 1908 and 1909."

The organisation of North Shields Association was further considered, and, on the proposition of Mr. W. Foster, seconded by Mr. J. T. Armstrong, Messrs. W. T. Weir, R. Heslop, W. Foster (Newcastle), J. R. Hadaway (North Shields), J. T. Armstrong (South Shields), and the Federation and organising secretary were appointed to interview the master builders of North Shields and Whitley.

The question of holding a Federation dinner was discussed, and it was decided to hold a dinner. The wish was expressed that the dinner should be held at Blyth, and this was agreed to.

The financial statement was considered, and on the proposition of Mr. J. T. Armstrong, seconded by Mr. W. Foster, accounts amounting to £18 18s. were passed for payment.—W. H. HOPE, solicitor, secretary, Post Office Chambers, 14, Norfolk Street, Sunderland.

Insurance.

Free £500 Accident Insurance Coupons have this week been sent to the following:—

C. H. E. (Aberdare), B. C. A. (St. Austell), C. J. D. (Bray), W. H. (St. Pancras), L. W. T. (Dinas Powis), C. W. R. (Hull), J. G. (Bridgend), C. E. H. (Croydon), H. T. S. (Ilkeston), J. A. M. (Grantham), R. V. H. (Halifax), J. H. P. (Whitchurch), F. E. C. (Rochester).

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Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Abersychan. — For erection of two houses at Mount Pleasant, Waterloo Road, Abersychan. Messrs. Pitten and Wilton, Architects, Club Chambers, Pontypool.

Powell Bros., Pontypool	£512	0	0
Bailey Bros., Pontypool	478	0	0
W. Brouch, Abersychan	465	5	0
W. H. Campbell, Pontypool	465	5	0
R. Meara, Ffrwd Road, Abersychan	458	0	0
W. Cleaves,* Abersychan	435	0	0

*Accepted.

Acrefair, near Ruabon.—For erecting a new hall adjoining the Trinity Presbyterian Church, Acrefair. Messrs. Dickens-Lewis and Haymes, Architects, Talbot Chambers, Shrewsbury. Quantities by Mr. Thos. Barlass.

R. Roberts	£2,257
E. H. Nicholas	1,987
J. Carden	1,987
G. H. Bickerton	1,970
I. Jones	1,966
J. T. Jones	1,965
I. Jenkins	1,953
W. F. Humphreys	1,950
J. Hayes,* Shrewsbury	1,790

*Accepted.

Annfield Plain (Durham).—For building a church for the United Methodists at Annfield Plain. Mr. A. T. B. Kell, 61a, Front Street, Chester-le-Street, Architect.

T. Auld, Huthwaite	£1,511	0	0
J. E. Walker, Leadgate	1,461	0	0
D. and J. Rankin, Sunderland	1,370	0	0
J. Morley, Tantobie	1 341	8	7
E. Dyson, Pelton	1,320	0	0
Middlemiss Bros., Newcastle-on-Tyne	1,285	0	0
S. Fenwick and Co., Newcastle-on-Tyne	1,283	0	0
J. W. White, Sunderland	1,275	0	0
R. Southren, Dipton	1,273	0	0
T. Reynoldson and Son,* Dipton	1,236	0	0

*Accepted.

Barwell.—For the erection of a new Council school, for the Leicestershire County Council Education Committee. Messrs. A. E. and T. Sawday, FF.R.I.B.A., Architects, Market Street, Leicester. Mr. Ernest G. Fowler, Surveyor, 33, Bowling Green Street, Leicester.

J. T. Richardson, Leicester	£5,870	0	0
T. Barker and Sons, Loughborough	5,699	0	0
G. W. Wainer, Nottingham	5,608	0	0
G. W. Heath, March, Cambs.	5,515	0	0
Bowles and Son, Leicester	5,460	0	0
G. Greaves, Hinckley	5,358	10	0
A. Woodcock and Son, Leicester	5,347	0	0
J. Cole and Sons, Leicester	5,292	0	0
Wileman and Gange, Ibstock	5 183	0	0
S. Chaplin, Stoke Golding	5,080	13	0
W. Hanson, Leicester	5,070	0	0
H. H. Garlick, Mowsley	5,044	19	8
W. Moss and Son, Coalville	5,040	0	0
F. J. Bradford, Leicester	5,027	0	0
Clark and Garrett, Leicester	5.015	0	0
W. Potter, Blaby	5,007	15	0
F. Oldershaw, South Wigston	5,006	9	6
F. Sleath, Rothley	4,985	0	0
Bradshaw Bros., Leicester	4,967	18	6
E. Fox,* 6, Evington Street, Leicester	4,949	0	0
G. Gurney,† 99, Vulcan Road, Leicester	4,880	0	0

†Withdrawn.

*Accepted.

Burslem.—Accepted for extensions at the electricity Works, for the Town Council:—

J. Grant, buildings, £1.400; Babcock and Wilcox, boiler £1,100, pipework £108; Bellis-Siemens generator set, £2,922; I. Storey, condenser, £1,600; Crompton and Co., switch gear, £100.

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G. F. Kenny, Ipswich	1,593	0	0
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H. E. Ambrose, Cambridge	1,497	18	1
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F. R. Warren, Bury St. Edmunds	1,411	15	5
Hinnels and Son, Bury St. Edmunds	1,393	9	8
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G. Grimwood and Sons, Sudbury	1,314	0	0
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W. H. Hinkins and Sons, Ltd., Royston	1,247	0	0

(Tenders continued on page viii.)

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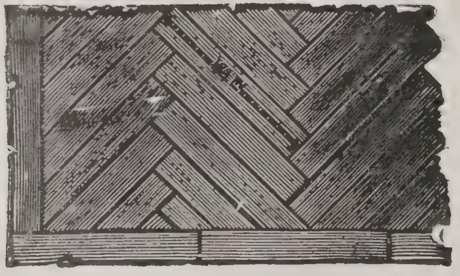

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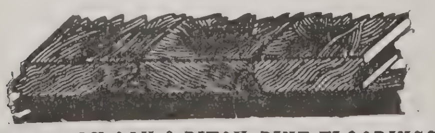

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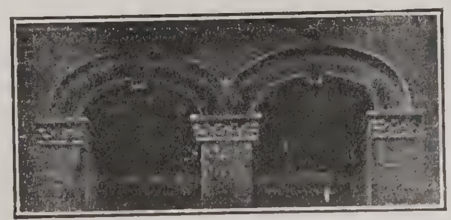

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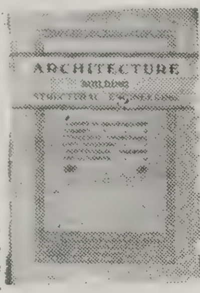

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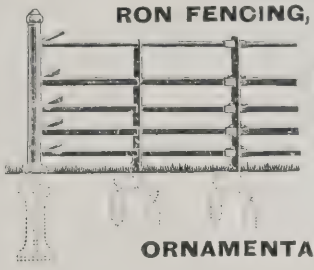

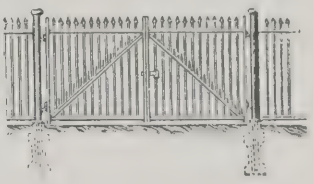

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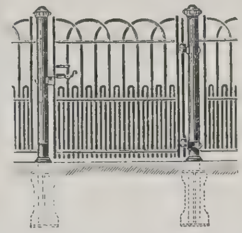

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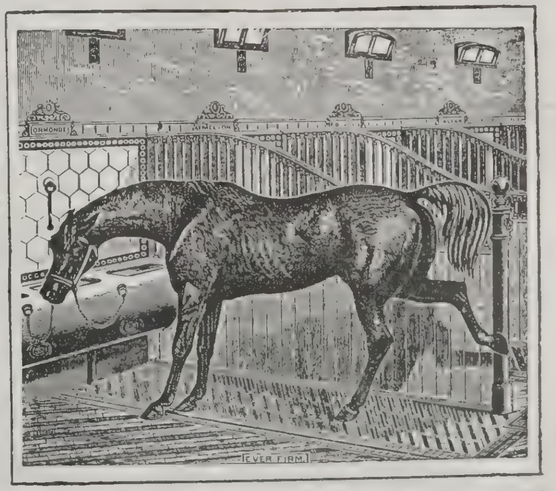

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(Tenders continued from page vi.)

Caxton (Kent).—For cattle cake mill at Caxton, for Mr. W. J. Mackey. Messrs. Ruck and Smith, Architects, 86, Week Street, Maidstone.

W. T. Burrows	£7,275	0	0
G. F. Burr, Gravesend	6,156	14	8
J. W. Ellingham, Dartford	5,297	0	0
Cox Bros.	5,260	0	0
R. Corben and Co.	5,245	0	0
Barden and Head	5,240	0	0
H. Dixon, Smarden	5,210	10	0
Kemp Bros., Rainham	5,173	0	0
H. E. Phillips, Gillingham	5,130	0	0
G. Baker and Son, Strood	5,043	0	0
J. Wilford, Snodland	5,015	10	0
Elmore and Son	5,015	0	0
J. A. Davidson, West Malling	5,010	0	0
G. Gates and Son, Frindsbury	4,998	0	0
Clarke and Epps	4,989	0	0
C. E. Skinner, Chatham	4,946	0	0
West Bros., Strood	4,933	0	0
J. Smith and Sons, Ltd., South Norwood	4,758	0	0
G. E. Wallis and Sons, Ltd.*	4,750	0	0

Rest of Maidstone.

*Accepted.

Deal.—For alterations and additions to the parochial schools, Deal, for the school managers. Mr. C. L. Crowther, Architect, Queen Street, Deal.

J. H. Forwalk, Ramsgate	£1,607	13	0
W. W. Martin, Ramsgate	1,325	0	0
G. Lewis and Sons, Dover	1,187	0	0
G. Browning, Canterbury	1,164	0	0
S. H. Jefford, Walmer	1,159	0	0
E. Bowles, Ashford	1,127	0	0
H. Dixon, Smarden	1,123	11	0
J. E. Hayward and Son	1,120	0	0
G. H. Denne and Son	1,079	0	0
W. Grigg, Dover	1,079	0	0
J. Parsons, Dover	1,033	8	8
G. B. Cottew	995	0	0
E. Trevers*	896	0	0

Rest of Deal.

*Accepted.

Deal.—For erection of new Masonic Hall, Deal, for the Freemasons. Mr. C. L. Crowther, Architect, Deal.

W. H. Grigg, Dover	£2,998
W. W. Martin, Ramsgate	1 897
S. H. Jefford, Walmer	1,689
G. Browning, Canterbury	1,687
E. J. Bowles, Ashford	1,680
E. Trevers, Deal	1,633
G. Lewis and Sons, Dover	1 573
J. Parsons, Dover	1,543

Deal.—For erection of house for Mr. F. Franklin. Mr. C. L. Crowther, Architect, Deal.

G. Browning, Canterbury	£997
G. Lewis and Sons, Dover.	994
G. B. Cottew, Deal	942
J. Parsons, Dover	850
J. Hayward and Son,* Deal	839
S. H. Jefford, Walmer	829
E. Trevers, Deal	800

*Accepted.

East Kirkby (Notts.).—For branch stores, Diamond Avenue. Mr. W. H. Woods, Architect, High Street, Long Eaton. Quantities by the architect.

J. Beckett	£710
W. Bains	706
A. W. Hoole	675
Stubbings and Fell	670
T. Auld	641
J. Tate and Son,* Annesley, Woodhouse	640
J. Greenwood	637

*Accepted.

Heathfield (Sussex).—For erection of recreation hall, for Messrs. Reed and Ticehurst. Mr. Arthur H. Burtenshaw, P.A.S.I., Architect, 7, Bolton Road, Eastbourne.

O'Connor	£2,177
F. G. Collins	2,159
T. Rich	2,150
Siever	2.040
T. O. Harmer*	1,787

* Accepted.

Kingsdown, near Deal.—For erection of house at Kingsdown, for Mr. Will Owen. Mr. C. L. Crowther, Architect, Deal.

E. Trevers	£788
J. Hayward and Son	744
S. H. Jefford, Walmer	759
G. H. Denne and Son*	748
G. B. Cottew	734

Rest of Deal.

* Accepted.

London, S.W.—For erection of shops with flats above, upon site of 118, Draycott Avenue, and 119 to 121, Walton Street, Fulham Road, S.W., for Mr. H. E. Beddington. Messrs. Joseph and Smithem, Architects, 83, Queen Street, E.C. Quantities by Mr. Chas. W. Latter, 53, Doughty Street, W.C.

Ashby and Horner	£2,595
Holloway Bros.	2,590
J. Carmichael	2,494
F. G. Minter	2,470
Higgs and Hill	2.424
C. W. Bovis and Co., Ltd.	2,399
Holliday and Greenwood	2,388
G. E. Wallis and Sons, Ltd.	2,337
W. Lawrence	2,332
J. Lenn and Co., Ltd*	2,305

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London.—For erection of domestic economy and manual training centres at Duncombe Road School, Islington, for the London County Council.

Treasure and Son, Ltd., Upper Holloway	£1,885	0	0
J. and M. Patrick, Wandsworth	1,873	0	0
Brand, Pettit and Co., West Green Road, South Tottenham	1,870	0	0
G. Godson and Sons, Kilburn	1,840	0	0
McLaughlin and Harvey, Ltd. Brecknock Road	1,836	0	0
G. S. S. Williams and Sons, Richmond Street, Thornhill Square	1,828	0	0
J. Grover and Son, New North Road	1,827	0	0
C. P. Roberts and Co, Highbury	1,816	0	0
McCormick and Sons, Northampton Street, Essex Road	1,688	0	0
Stevens and Sons, Yonge Park	1,676	0	0
G. Neal, Tennyson Works, Willesden Lane	1,565	0	0
J. Stewart,* 174, West Green Road, Tottenham	1,391	5	0

Architect's (Education) estimate, £1,400.

*Recommended for acceptance.

Newtown (Montgomery).—For erection of the Carreghofa new Council school, for the Montgomeryshire Education Authority.

W. Felton, Oswald Road, Oswestry	£1,950	0	0
R. Turnbull, Lymore, Montgomery	1,796	0	0
E. Davies, Welshpool	1,758	0	0
Wall and Beckett, Llanymynech	1,730	0	0
W. H. Thomas, Oswestry	1,482	12	7
J. J. Meredith, Hafren Building Yard, Llanidloes	1,380	0	0
I. Jones, Llanfechain	1,367	19	0
W. Griffiths and Sons,* Ellesmere	1,200	0	0

*Accepted.

Norwich.—For erection of factory, for Messrs. Brett and Sons, Ltd. Messrs. Morgan and Buckingham, Architects, 1, Upper King Street, Norwich.

T. Gill and Son	£2,433
Podd and Fisher	2,358
G. E. Hawes and Sons	2,345
J. Youngs and Son	2,277
Scarles Bros.	2,270
T. Yelf	2,175
Anderson and Sons	2,140
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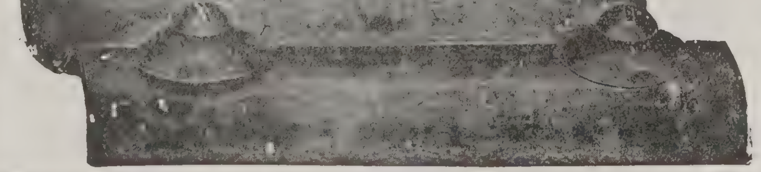

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The Moral of Middlesbrough.

The Middlesbrough Library Competition incident has now apparently reached its close. It will be remembered that a large number of the unsuccessful competitors protested strongly against the awards, on the alleged ground that in two of the premiated designs the conditions had been violated, to the advantage of the winning designs and to the disadvantage of those in which the conditions were supposed to have been more punctiliously observed. Eighty-three of the unsuccessful competitors (about 200 sets of designs were sent in) having the courage of their own opinion, sought and obtained the opinion of counsel. Two eminent barristers were consulted, and both agree that there is no ground of action against either the Council or the assessor—particularly not against the assessor, between whom and the competitors there was no contract. The immunity of the assessor in such cases seems to us to be perfectly just. If an assessor were liable to be dragged into court by all the unsuccessful competitors who felt (as in such cases we are all apt to feel) that they had a just cause of complaint against him, the position of an assessor would become utterly untenable. An excellent object has been served in showing that, according to eminent counsel, the assessor has, under ordinary conditions, no legal liability towards the competitors. The assessor's duty is "of a judicial or quasi-judicial character, and not one for breach of which an action would lie against the assessor." Less gratifying is the inference that the organisers of a competition are almost equally free from liability to the competitors. The organisers, it would seem, can effectually shelter themselves behind their assessor, who, as we have seen, cannot be called to account. In ordinary cases, therefore, where authorities take the common means of safe-guarding their own interests, the competitors who may feel that they have just cause of complaint are apparently destitute of all legal remedy or redress. As Mr. C. A. Russell has said, "the only effectual protection of the competitors is the competence and fairness of the assessor." Here we would repeat the perhaps unpalatable truism on which we have, in an earlier note on the Middlesbrough competititon, laid some stress—namely, that competitions are not held for the benefit of the architects, but in order that the organisers may get the design that is thought to be most suitable for their purpose; and they rely on the assessor to see that they get it. We imagine that the assessor, as a rule, will adjudicate in this spirit; and if the design that he thinks is on the whole the best happens to override in some particulars the conditions that have been laid down, he will not hesitate between the spirit and the letter. Hence it is difficult to agree entirely with the suggestion of the spokesmen of the Middlesbrough protesters as to "the necessity of the assessor drawing up the conditions himself when practicable, or, if he accept them, being bound to see that they are fully carried out." As to the advisability of the assessor himself drawing up the conditions, we are not for the moment concerned to discuss a proposition that is perhaps not so simple as on the surface it may appear to be; and with regard to the contention that the assessor is bound to see that the conditions are "fully carried out," while we admit that such a course would greatly simplify the work of adjudication, and would be extremely convenient for the competitors, we cannot help feeling that it would have a narrowing effect on both assessor and competitors, and would rather tend to destroy the *raison d'être* of competitions. When, therefore, Mr. Russell, K.C., observes that "Possibly it would be some protection to competitors if in all such cases it was made a definite instruction to the assessor that he was to treat as disqualified for a prize any design (however excellent in other respects) which did not fully comply with the conditions of the competition," he seems to us to encourage an illusory hope. The object of a competition is not to give prizes to architects, and it is simply inconceivable that a corporation will issue instructions to the assessor to disregard its own interests in the manner suggested. When any corporation becomes so loftily altruistic as to say to the assessor, "Never mind about getting the best design; give the prizes to the men who toe the line," the millennium will be appreciably closer. We still think that the road to reform lies in the direction not of greater stringency, but of larger freedom. Certainly competitors should not be harassed with doubts as to whether or not they may venture to override an awkward condition. They should have a free hand as regards well-nigh everything but accommodation and cost; and corporations would save themselves, the assessor, and the competitors a world of trouble and annoyance if they made their conditions few, essential, and explicit, and left everything else to the skill and intelligence of the competitors, and the discretion of the assessor. This appears to us to be the real moral of Middlesbrough, and we certainly think that the gentlemen who have had the public spirit to obtain counsel's opinion are to be congratulated on having placed competitions in a clearer light if not on a more satisfactory footing.

Arbitration Clauses

Three legal cases that are summarised in the present issue, are of more than ordinary interest to contractors. In one, the Court of Appeal decided that certain words alleged by the Corporation of Barrow to constitute an arbitration clause, had no such force. Consequently, a former order by Lord Justice Buckley, based on the supposition that the terms of contract made the defendant's engineer sole arbitrator in the event of disputes, has been upset in the Court of Appeal, the Court holding that the clause in question gave the engineer administrative powers only, and not judicial powers. That is a minor point in favour of those who contend, as we have contended, that an architect or an engineer, or any other person who may be regarded as the agent of one of the parties, ought not to possess the right to act as sole arbitrator in a dispute arising between those parties. Such an arbitrator is placed in a most invidious position, and it is gratifying to find that, in the course of the action, Lord Justice Vaughan Williams expressed the opinion that, if there was good reason, having regard to events that had occurred, to think that justice might not be done in an arbitration, the Court might, in the exercise of their discretion, override such a clause in a contract—an utterance that will do much to strengthen the position that contractors are taking with respect to this very important question of contractual referees.

Extras and Agency.

The second case raises the eternal question of extras, and the equally persistent problem of agency. In this case the contractor for the construction of a sewer found that actual physical conditions were different from those that had been anticipated, and that expensive deviations became necessary as the work proceeded. Some of these deviations were, it was contended, sanctioned by defendants' agents, and here an important point arises. "If," said the Official Referee, "the work was in fact so changed as to be a different one, there would be the difficulty of implying a contract to pay for it, as the engineer had no authority to make such a contract for the defendant Council." The engineer's powers, it would therefore seem, may be freely limited in favour of his employers, who may apparently disavow his agency almost whenever they think proper—when, for instance, he sanctions extras for which they do not wish to pay, or when they affect to regard him as a disinterested arbitrator between themselves and the contractors. This is certainly consistent; but as certainly it points to the necessity for some modification or re-adjustment of both the legal and the lay views of the relationship at present subsisting between the owner, the intermediary, and the contractor; for it is evident that under the present conditions the contractor incurs more than his fair share of the responsibility. The chief lesson to be drawn from the present case, however, seems to be that contractors should refuse to proceed with extensive extras until they get an authoritative order in writing.

Waiting for Wages.

In the third case to which attention is drawn, employers successfully resisted the claim of a dismissed workman to be paid for the time during which he was kept waiting for his wages. He was given an hour's notice at five o'clock in the morning, and he was not paid his wages until 10.45. He claimed 3s. 11d. for the time. The county court judge had allowed his claim, but, on the appeal, Mr. Justice Darling held that the plaintiff was under no obligation to wait about for his money, and was no more entitled to be paid for waiting than any ordinary creditor—a tailor, for instance, or a barrister who was kept waiting for his fees—or, his lordship might have added, a builder who is kept waiting an outrageous length of time for what is due to him on a long-finished contract. It is just and necessary that wages should be promptly paid; and employers have generally agreed to the demand that not one precious minute of the workman's leisure shall be unnecessarily consumed in waiting for wages. This, however, is a humane or an expedient concession to circumstances. The case under notice seems to illustrate a not very amiable characteristic of workmen, and a spirit that has a most discouraging and depressing effect on employers, who naturally feel hurt at the tendency to assume as a legal right the privileges that have been conceded as an act of grace, and to expect preferential treatment in both the making and the administration of the nation's laws.

Freak Architecture.

In a recent issue of a popular magazine, there is an illustrated description of what is assumed to be an extraordinary freak on the part of a Colonial architect. Some of the windows, high up in a public building, are supposed to be shaped like the broad arrow, the decorative device that adorns the convict's uniform, while over one of the openings is a moulding that is thought to bear a strong resemblance to "the hangman's rope," although it is perhaps only inferentially that specific brand of cordage. The explanation is that the building was erected by convict labour, and that the architect took advantage of his opportunity of symbolising that fact. The resemblance to a broad arrow and to a rope is (as shown by the illustration in the magazine) in each case sufficiently strong to give colour to the story; which, nevertheless, is probably one of the happy inventions of "that ingenious merry gentleman Mr. Benjamin Trovato," who has elaborated for our entertainment and edification many another gaily eponymous legend, such as that of the apprentice's column, whose transcendent beauty so incensed the master mason that, in a fit of jealous rage, he incontinently slew the clever but ill-fated youth; or that less tragic but equally unveracious narrative of the vane resembling what the dictionary calls "a wingless insect, parasitic in man," which was alleged to have been set up on the church steeple to typify the disgustingly mean treatment of the builder by parsimonious trustees; the vane being actually intended to represent, however, not the kind of "crawlin' ferlie" which Burns saw on a lady's bonnet in church, and which, with wretched taste, he immortalised in the paltriest of poems, but a majestic comet. For either object, the scale was purely arbitrary. Frankly, we have no belief whatever in the arrow and rope story. But it is good enough for the Marines—and the popular magazines.

Guildhall "Vernacular Gothic."

It is recorded, in the account of our representative's interview with Messrs. Lanchester and Rickards, that one of the *obiter dicta* thrown out by the gentleman first named was that he did not favour the term "town planning." He preferred the expression, "civic design." If (which is highly improbable) he has since happened to read in the newspapers an account of a recent instructive debate in the London Court of Common Council, he may see reason to revise his preference; "civic design," in the light of these proceedings, having assumed an aspect which he had possibly not foreseen. The Common Councillors were in uncommonly jocular mood, and some of their speeches were in the "vernacular Gothic" style. On a recommendation by the Lands Committee that three storeys should be added over the library corridor of the Guildhall, at an estimated cost of £3,800, Mr. Deputy Wallace moved the reference back. There ought, he thought, to be "a grand scheme of improvement which would enable the old Guildhall to stand for the next five thousand years." Mr. Banister Fletcher imported a little real architectural interest into the discussion by stating that the Guildhall is virtually a modern building, as the late Sir Horace Jones, when architect of the City, succeeded in producing, in the nineteenth century a fifteenth century building, and "Dance's front represented a page of the City's history of which they were not proud." Whereupon, "God bless my soul and body!" piously ejaculated a worthy deputy, "you have only to inspect the pillars that have been scraped in the Guildhall to see traces of the Great Fire," and he contended that the only new part of the great hall is the roof. Another gentleman said that the present front is "an architectural abortion;" yet another deprecated the perpetuation of "bastard Gothic." The upshot of the debate, however, was that the amendment was negatived. There was a hint at entire re-building. Would that it might speedily fructify! The City of London surely ought to possess a Guildhall constructed on the best principles of civic design, and pure and dignified beyond the cavilling of Common Councilmen.

It is announced in Rome that Professor Toramelle has discovered a prehistoric town in the centre of Barbagia (Sardinia), with streets, houses, and temples, and a surrounding wall of Cyclopean proportions. Professor Orsi and Professor Mackenzie of Edinburgh have arrived at Sassari to investigate the discovery.

MUNICIPAL TRADING.

The following letter has been published in the "Yorkshire Observer":—

LEEDS CORPORATION WORKS DEPARTMENT.

Sir,—The members of the Leeds Master Builders' Association, who belong to different political bodies and have every desire as a trade society to maintain strict political neutrality, take the liberty of trespassing on your courtesy to make one or two observations on the various statements which have recently appeared with respect to the Works Department of the Leeds Corporation.

The members desire to place on record their appreciation of the additional opportunities which have been afforded to private traders during the year of tendering for works which had been previously carried out by the Works Department, and note with satisfaction the increased volume of work which has been let to them. When comparison of labour is being made one should bear in mind not only the workmen at present directly engaged by the Corporation, but also have regard to the additional work carried out by contract. So far as the members of this association are concerned the volume of Corporation work has increased very appreciably during the past year, with its incident benefit to their employees and their dependents; while the ratepayers have also derived substantial financial benefits by this policy.

That this procedure is not detrimental to the workmen employed, either as regards wages or conditions of labour, is beyond question. One of the leading operative officials recently admitted that the Leeds Corporation were harder taskmasters than the private employers. Nothing further need be said on this point in the face of such testimony.

Many examples could be quoted as to the increased burden which has fallen on rates when municipalities have unduly trespassed on undertakings outside the recognised monopolies. The Bradford Corporation some years ago established a Team Labour Department, and notwithstanding the fact that it has prior claims for work on the other Corporation departments, it has been a charge on the rates since its inception, the loss last year being £1,556.

The association confidently assert that the policy recently pursued of giving private traders an opportunity of tendering for Corporation work is in the best interests of the workmen in particular, and of the ratepayers in general. It is gratifying to note that, while there are observations by both political parties on this subject, there appears to be no difference of opinion in regard to the wisdom and expediency of the Corporation entering into direct competition with private traders for works which are usually carried out by them.—I am, etc., J. Davidson, secretary to the Leeds Master Builders' Association.

Mr. Arthur Marshall, the well-known Nottingham architect, and one of the foremost amateur photographers in the country, is shortly to hold an exhibition of his prints in London.

* * *

With reference to the article which appeared in our issue of October 27th, in respect of the Parklangley Estate, it is pointed out that any impression that only one architect (viz., Mr. Reginald Fry) is designing houses for this estate would be erroneous. Mr. H. T. Bromley, A.R.I.B.A., Mr. Edgar Underwood, F.R.I.B.A., Messrs. Durrans and Groves, and others have designed houses which are in course of erection on this estate.

* * *

A Builders' Protection Society for Portsmouth has been formed, in consequence of a feeling that the trade are being unduly harassed in their work by unnecessary restrictions. We hope to find room in a future issue for further reference to this matter, which is obviously of more than local importance.

Architects of the Day.

VI. and VII.—Messrs. Lanchester and Rickards.

Probably no English firm of architects has had a more brilliant career than that of Messrs. Lanchester and Rickards. Most architects blossom into practice with small beginnings, designing a house for an admiring relative, or taking over a small work from a considerate and over-worked principal. But Messrs. Lanchester and Rickards commenced with big works and have adhered to them ever since. And if, as a well-known architect has told us, it is only the big buildings that pay or are worth doing, the firm are to be congratulated no less upon their wisdom than upon their success. Their success in competitive work is a notable proof of the value of the competition system (besmirched and discredited as it often is by gross abuses) in discovering latent talent and enabling the younger men to come to their own. Had competitions been an unknown feature of the modern art of building, it is probable that the firm would never have come into existence: Mr. Lanchester might now be pursuing the quiet tenour of an ordinary practice, and Mr. Rickards, if we are to share his own supposition, might have been a painter. It is neither fulsome nor exaggerated praise to say that English architecture would have been a heavy loser in such case, for we have here one of the few firms who can graft on to the stock of English Renaissance a certain freshness of treatment and a desirable breadth of conception that we are now tardily endeavouring to learn from France via America.

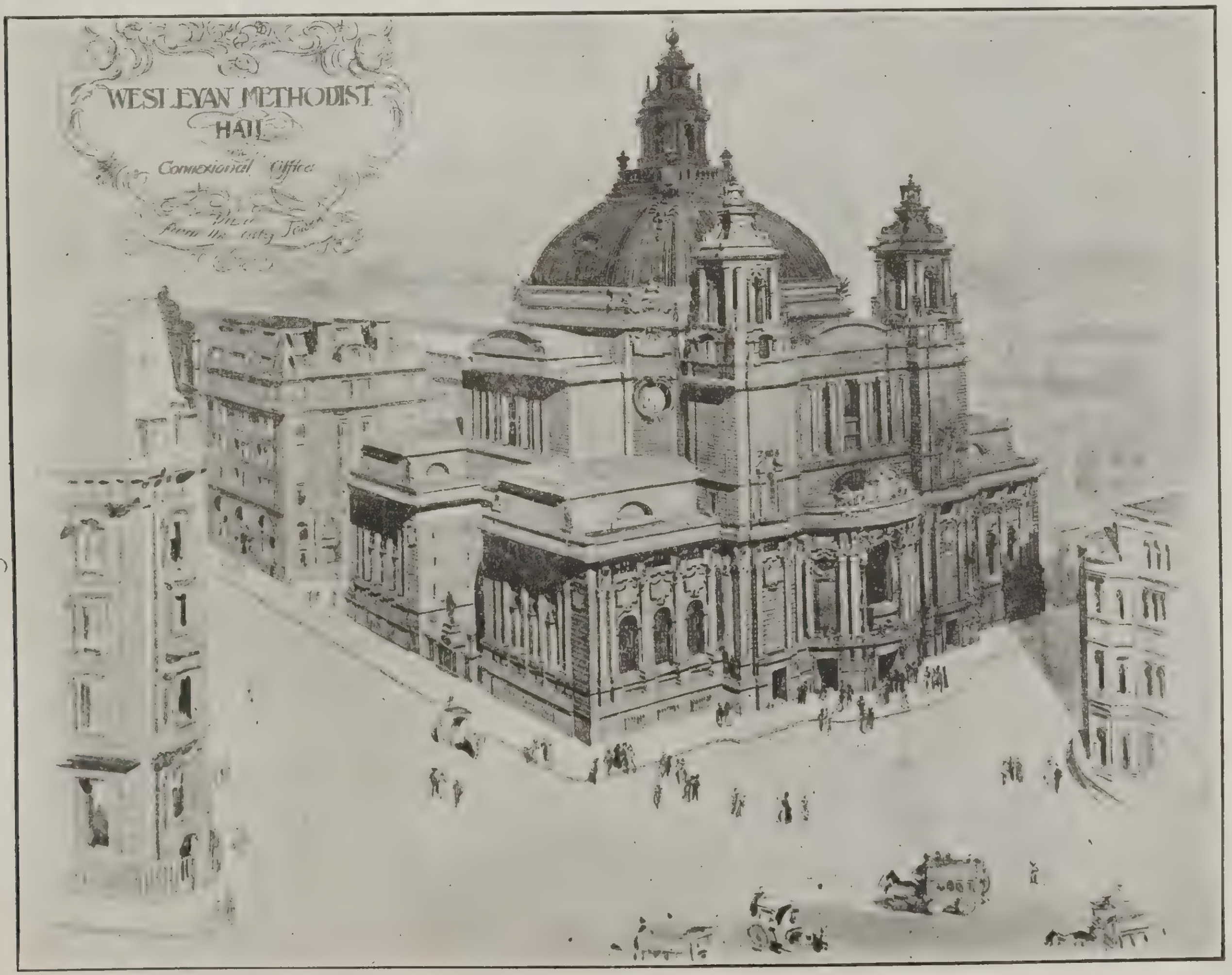
As is probably known to our readers, the firm was originally Lanchester, Stewart and Rickards, and it was under this style that the architectural world first learnt of the rise of a new firm, who, by winning the Cardiff Town Hall Competition, showed that it was to be reckoned with in the future big works of the United Kingdom. To-day, this seems, perhaps, ancient history. We are so accustomed now to look out for their design in any big competition that it is difficult to remember that the firm is comparatively young, and that its rise to eminence has been remarkably rapid. The untimely death, in 1904, of Mr. James Stewart, the second partner, broke an association that began in early days as assistants, and the firm has since been continued by the surviving partners with whom our notes deal to-day

Mr. Henry Vaughan Lanchester commenced articles with his father in 1879, and later entered the office of Messrs. Eedle and Myers, whose work was largely concerned with the design of hotels and licensed premises. Later he worked in the office of Mr. T. W. Cutler, F.R.I.B.A., and with Mr. George C. Sherrin, F.R.I.B.A. At the latter office he met Mr. Stewart, and thus began the friendship which was later to blossom into a partnership. Subsequently, and prior to the commencement of this partnership, he started in private practice, and carried out a number of works, among them a house at Sydenham for Mr. J. L. Johnston; the laboratory of the Institute of Chemistry, and the Bovril Company's warehouse and offices in Old Street, St. Luke's. Mr. Lanchester had a distinguished career as a student, winning the Aldwinckle Studentship and the Owen Jones studentship at the R.I.B.A., in 1889-90. He was elected A.R.I.B.A. in 1889, and F.R.I.B.A. in 1906, has been a member of the Council of the R.I.B.A. since 1899, and is a member of the Competitions Committee of the Institute, and one of the hon. secretaries of its Town Planning Committee.

Of recent years Mr. Lanchester has taken a keen interest in questions of town planning, which he prefers to call by the more comprehensive and correct term of Civic Design, and in pursuance of this study he visited America in 1907 to see many of the large schemes of civic planning that were either proposed or were in actual progress in the big American cities. The exigencies of his practice give Mr. Lanchester few opportunities to indulge his hobby for water-colour sketching—much to his regret; but he has always taken an active interest in the other arts, and has many artist friends.

It is a characteristic of the firm that they have always endeavoured to place the work of embellishing their buildings in the hands of artists. The fine sculpture at the Cardiff Town Hall and Law Courts from the chisels of Messrs. Paul Montford, Albert Hodge, Henry Poole, D. McGill, H. C. Fehr, and others, comprises some of the best and most vigorous modern English work. And unlike so many of our modern buildings, these buildings have been designed for sculptural adornment, and their sculpture has been designed for them. Such a happy result could only obtain where there was mutual appreciation and sympathy between the architects and their sculptors. A fine design by Mr. Charles Sims, A.R.A., for a painted ceiling to the staircase hall at Cardiff is another evidence of the firm's desire to employ a daughter art; but unfortunately this has never been carried out, and a bequest for decoration at the Town Hall has unhappily been devoted to other purposes.

Mr. Edwin Alfred Rickards, elected F.R.I.B.A. in 1906, summarised his early career in the words: "I never did any good till I met Lanchester," a tribute, more than once repeated, that bears testimony not only to his partner's good feeling, but also to his discernment. Not being certain that such a condensed account would satisfy our



BIRD'S-EYE VIEW OF THE WESLEYAN METHODIST HALL, NOW BEING ERECTED AT WESTMINSTER FROM THE DESIGNS OF LANCHESTER AND RICKARDS, FF.R.I.B.A.

NOTABLE BUILDINGS IN GLOUCESTER.*

By F. Dare Clapham, F.R.I.B.A.

Gloucester.

About four miles further on to the south-west is Gloucester, a city which has often figured in history; it was an important military station under the Romans, and surrendered to the Saxons towards the end of the sixth century. Owing to its position on a navigable river, it has always been of some importance.

In the time of William the Conqueror it was a favourite resort for his court, and several of the Norman Kings used to spend Christmas there. In 1087 the city was nearly destroyed during the contest between William II. and his brother Rupert. Later it was the scene of many conflicts between Henry III. and the Barons, owing to his having appointed a foreigner as Constable of the Castle. It suffered from fire three times in the twelfth century, and again in the middle of the thirteenth century. Parliaments were held there by Edward I., Richard II., and Henry IV. In 1483 Richard III. came to Gloucester after his coronation, and from here gave the order for the murder of his two nephews.

The city opposed the Royalist cause in the Parliamentary wars, and for this reason at the Restoration its walls were destroyed.

The walls of the city were 5ft. to 9ft. thick, surrounded by a deep moat; there were four gates, north, south, east, and west, about ¼ mile apart, and where the four roads met in the centre of the town there was a High Cross, which was demolished in 1750.

New Inn—Fifteenth Century.

One of the most interesting buildings in the city is the New Inn, built at the end of the fifteenth century by John Twining to accommodate the number of pilgrims who flocked to the tomb of Edward II. The New Inn was probably so called because it was built on the foundation of an older one; it was formerly one of the possessions of the Abbey of St. Peter, and after the dissolution of the monasteries it was granted to the Dean and Chapter, in whose possession it remained until recently, and formed part of their income. It is a picturesque, half-timber-framed building, built round two courtyards and covers a good deal of ground, being, without the stables, 170ft. long. The rooms all lead to open galleries running round the courtyards, approached by outside staircases to the different floors; the whole of the timber is chestnut, and parts of it are richly carved. There is a well-preserved angle-post at the corner of New Inn Lane, on which is some beautiful carving. There are two figures, both angels, holding scrolls bearing the words "Salve" to welcome the coming, and "Benedicti" to speed the parting guest. The canopies above the figures are particularly good.

Flemish Influence.

In Westgate Street there is a house with an old front with good windows bearing traces of Flemish influence; a chimneypiece inside bears the date 1633, and is celebrated as the house which Colonel Massey made his headquarters in 1643, when the city was besieged by Charles I. Many of the houses contain good panelling and elaborately carved chimneypieces.

In the house opposite the Corn Exchange, in Southgate Street, which has a carved and ornamented front, there is a handsomely carved chimneypiece, bearing the date 1650.

The house where Robert Raikes (the founder of the Sunday schools) used to live is an interesting half-timber building with three gables.

Gate Piers.

There are several good examples of gate piers in the city, those standing in front of the Foresters' Hall and another house in Westgate Street being most noticeable. There are numerous churches in Gloucester, but most of them are of a late date, having been erected on the site of earlier buildings.

Gloucester Cathedral.

At the end of the sixth century, on the site of the present cathedral, a monastery was first built which was destroyed by fire, as was also in 1058 the Benedictine one which superseded it. The foundation-stone of the present cathedral was laid in 1089, Abbot Serlo being in charge of the work. Twice at the beginning of the twelfth century the fabric suffered by fire, and it is probable that in one of these fires the original timber roof of the nave was destroyed. This flat wooden roof was some 20ft. higher than the present vaulting, which was finished about the middle of the thirteenth century. The columns of the nave show traces of fire, being much calcined. There were two more fires at the beginning of the fourteenth century, and the south aisle of the nave was then built to save the south side from falling. In the early part of the fifth century the reigning abbot destroyed the west front with its two towers, and is supposed to have added the south porch. In about the middle of the same century the central tower was demolished as far as the Norman piers, and the present beautiful tower was added, and the Lady Chapel was built towards the end of this same century. It was not, however, until the reign of Henry VIII. that the abbey was made a cathedral. The nave piers are just over 30ft. in height, being nearly twice the height of those at Norwich; they are about 21ft. in circumference and 12ft. 6in. apart. The present flooring of the nave is some 10in. higher than the original pavement. Mr. Waller, who carried out the repairs of the cathedral in 1856, says that the whole of the nave was painted. It was at one time proposed by Kent to flute the columns, but happily the architect found out that they consisted of a stone casing filled in with rubble. We were fortunate enough to be shown over the cathedral by the superintending architect, Mr. F. W. Waller, and the careful ½in. scale plans which he had prepared of the various stages of the tower were of great interest. The tower at the roof level is 40ft. square and 225ft. high; it is carried by four Norman piers, which are loaded to the extent of 12 to 13 tons per foot super., a load which would make a district surveyor's hair stand on end at the present day, for the total weight of the tower is about 4,700 tons. The pierced corner pinnacles, which weigh 25 tons each, are supported at the inner angles by slight squinch arches, and probably with the idea of reducing the weight of the topmost story, the walling of the panels is only 8in. thick. The cloisters were built during the latter half of the fourteenth century, and are probably unsurpassed in beauty by any in this country. The monks' lavatory, which occupies four bays of the northern side of the quadrangle, is 47ft. long, and is in a fine state of preservation, even the waste water tank being discovered about twenty years ago.

Perhaps the most interesting part of the cathedral is the choir, which at first sight appears to be entirely Perpendicular work, but in reality this is only a thin casing to the original Norman work behind; this casing was put on during the fourteenth century, and is very cleverly contrived. In order also to make room for the splendid east window, which is 72ft. high and 38ft. wide, and some 5ft. wider than the choir, the two end Norman piers of the apse were removed, as was also the eastern apsidal chapel, when the Lady Chapel was built; these alterations are made perfectly clear by an examination of the crypt, where the foundations of the original Norman work remain.

On the north side of the choir is the tomb of Edward II.

It would take an entire evening to describe all the beauties of this splendid cathedral, which is probably so well known to all of us, and, therefore, these brief remarks must suffice to-night to deal with what is probably one of the most interesting ecclesiastical buildings in this country.

This concludes the list of places visited on the fortieth excursion of the Architectural Association, an excursion rendered all the more enjoyable by being blessed with the only real summer weather we have had this year.

Discussion.

Mr. E. Guy Dawber proposed a vote of thanks to Mr. Clapham, and observed that he (Mr. Dawber) was one of the members of the party that visited Cheltenham when that locality was chosen for the excursion fifteen years ago. The paper, he said, was one of the most delightful essays that had been heard in that room; and he hoped they would make it a rule to have such a descriptive paper after every annual excursion. In past years it had been the custom to give a brief resume of the buildings to be visited; and this was particularly useful, as, owing to an anxiety to sketch the various examples of architecture, the other aspect was apt to be neglected. He thought that particulars might be worked up before the next excursion came round. He held Camden to be one of the most interesting towns in England, all the work there being of an exceptionally high character. During the seventeenth century two brothers—Michael and Baptist Hicks—had lived at Camden. They supplied the court with silks and satins, and also lent money to the courtiers. James I. being a somewhat impecunious monarch, it is believed that they also lent money to him; and Baptist became a knight, and afterwards a baronet. He built the almshouses, the Victoria House, the Market Hall; he re-roofed the chancel of the church, and carried out some other works at Camden. He also built himself a large house at Kensington, and that was how the Camden Hill of to-day derived its name. Unfortunately both houses had been burnt down. He thought that Mr. Clapham had struck the keynote when he said the architecture was remarkable for its simplicity and good proportion. When he had said that he had said everything. All the houses in the district bore a certain family resemblance, which showed how tradition had lasted. It was interesting to watch how the builders had taken up the Renaissance, introducing it into their doorways, their fireplaces, and their tombstones; but, once they had mastered the new class of work, they excelled to a surprising degree, and produced the most charming buildings with the same amount of character that had distinguished their earlier work. The work executed at the time of Queen Anne and the early Georges was both simple and picturesque. In conclusion, he thanked Mr. Clapham most heartily for his truly excellent and interesting paper.

Mr. H. D. Searles-Wood, in seconding the vote of thanks, said he would like to thank the gentleman who had made the lantern slides from his photographs. He had no idea that such excellent results could be obtained.

Mr. J. Johnson supported the vote of thanks, and observed that, although he was a member of the party that had previously visited Cheltenham, he was afraid his memory would not carry over the time that had intervened. The A.A. excursions were always intensely interesting, and he hoped to be able to accompany them again at some future time. They presented valuable opportunities for the making of sketches, and measured drawings.

Mr. Flint Clarkson also supported the vote of thanks, and said that he would like to add his word of praise to the congratulations that Mr. Clapham's paper justly merited. In regard to the stone slates, to which the lecturer had referred, he would be glad to know where they came from. Mr. Clapham had also mentioned a Benedictine Abbey at Winchcombe, for 300 monks. Surely that number was excessive, considering that St. Albans, a great abbey, had only 60. He believed that the only instance of the use of Camden stone in London was at Fulham, where it had been employed by Mr. J. D. Sedding.

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*Concluding part of the substance of a paper read to the Architectural Association on Friday, October 22nd.

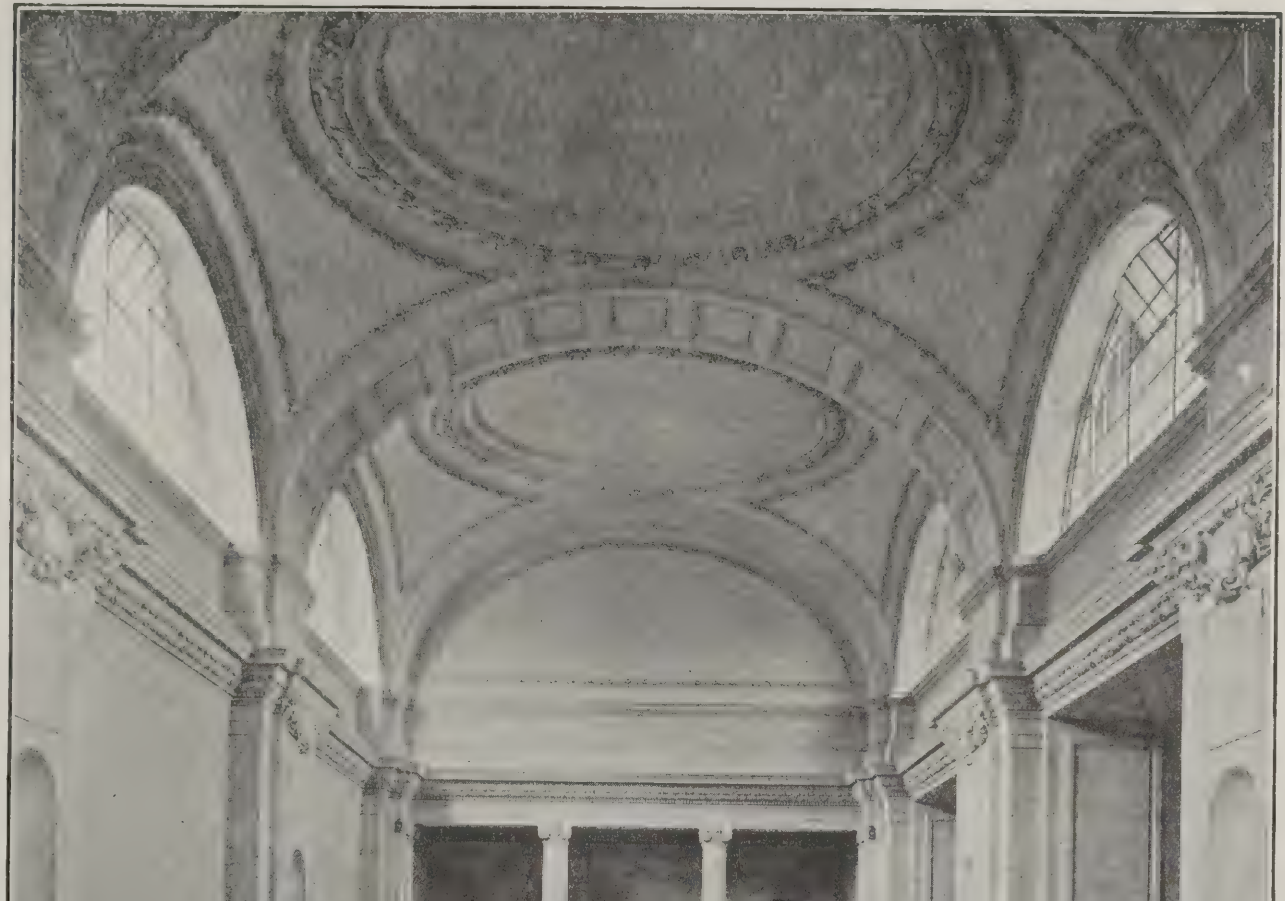


Photo: Thomas Lewis.

NEW LAW COURTS, CARDIFF: HALL TO ASSIZE COURTS. LANCHESTER AND RICKARDS, FF.R.I.B.A., ARCHITECTS.

The piers and special features of this hall are executed in Bath stone, the plaster and carved stone decoration being by Mr. Paul Montford.

Mr. C. E. Bateman having contributed a few remarks to the discussion,

Mr. A. N. Prentice remarked that the type of architecture found at Camden was also largely to be found in Northamptonshire. This probably was accounted for by the seam of stone that ran from the Wash to the Severn. In the local quarries, a thin bed of surface rock had been found, and this was largely used for the paving of gardens and for similar purposes. It was curious to note the absence of damp courses in the great majority of Cotswold buildings. It would be interesting to know exactly when they were introduced.

Mr. Henry Tanner, in summing up the discussion, observed that the paper was essentially non-controversial. He knew that Mr. Clapham had been expending a good deal of energy upon the preparation of the paper, but he had to admit that the result was even more surprising than he had anticipated. He thought that the lecture must act as a persuasive to younger members to join the excursions. Mr. Clapham, he thought, would make an excellent recruiting officer. Mr. Dawber would be pleased to know that they had already decided to make a paper dealing with the annual excursion a standard feature. With much pleasure he put a hearty vote of thanks.

Mr. F. Dare Clapham, in reply, said that Mr. Clarkson had certainly floored him with respect to the monks at Winchcombe. His only authority for the statement was that he had seen it several times in print. The stone slates, he believed, were obtained locally. In conclusion, he would like to say that the one thing which all the excursionists had in common was the enjoyment of the delightful architecture in the rural districts of England.

Mr. Searles-Wood having offered to bear part of the expense which would be incurred in the reproduction of some of the fine drawings that adorned the wall, for publication in the A.A. journal, Mr. Tanner formally accepted the kind offer.

The new R.I.B.A. Kalendar, for 1909-10, has appeared, price half-a-crown, and is to be had from the Royal Institute of British Architects, 9, Conduit Street, Hanover Square, W.

* * *

The hospital extension at Norwich, of which the King laid the foundation stone on October 25th, has been designed by Mr. E. T. Boardman, who presented his Majesty with the silver trowel with which the ceremony was performed.

* * *

A meeting of the Gloucestershire Architectural Association was held in Gloucester on Thursday evening, October 28th, the president (Mr. H. W. Chatters) in the chair. Others present included Messrs. W. B. Wood, E. J. Cullis, T. Malvern, E. A. Pryer, J. G. Crisp, G. P. Milnes, D. R. Lyne, and T. Overbury (hon. secretary). A resolution in favour of the statutory registration of architects was proposed, which gave rise to an animated discussion. The resolution was carried unanimously.

* * *

As the result of deliberations by the executive of the British Science Guild a correspondence took place between them and the London County Council, in which the guild drew attention to the anomalous manner adopted in London for the numbering of streets. The guild made certain suggestions, and as a result of the correspondence the County Council have now laid down the following rules:—"St. Paul's Cathedral is recognised as a central point; and the numbering of houses begins at the end or entrance of the street nearest to that building, except where a street leads from a main thoroughfare. Taking, therefore, the sides of a street as left and right (assuming that the back is towards St. Paul's), the odd numbers will be assigned to the left-hand side, and the even numbers to the right-hand side."

CONTRACTORS & CORPORATIONS: IMPORTANT LEGAL DECISIONS.

The following interesting cases were reported to the members of the Yorkshire Federation at their recent meeting:—

William Kennedy, Ltd., v. Mayor and Corporation of Barrow-in-Furness.

The recent decision of the Court of Appeal in William Kennedy, Ltd., v. Mayor and Corporation of Barrow-in-Furness, turned on the question: What is an arbitration clause? A contract was entered into for the construction of a dam and intake, but defendants' engineer, alleging that defect existed, refused a certificate of completion, and employed others to do certain works which he considered necessary to remedy the alleged defects. Plaintiffs accordingly brought an action to recover £31,264, the balance alleged to be due under the contract. On the application of defendants, Lord Justice Buckley made an order staying the action under Section 4 of the Arbitration Act, 1889, on the ground that the contract provided that defendants' engineer should be sole arbitrator in the event of any disputes. In appealing against the order, plaintiffs contended that the matter was not one that should be referred to him, especially as he would, in a sense, be the principal witness.—The Court, in unanimously allowing the appeal, held that the contract contained no such arbitration provision as was contended. In the opinion of Lord Justice Vaughan Williams, the clause relied on was a provision giving the engineer only administrative and not judical powers, and the words did not amount to a submission to arbitration. That being so, there was no ground for invoking the provisions of Section 4 of the Arbitration Act. Lord Justice Fletcher Moulton added that the clause was a carefully drawn up agreement, in which there was not only an absence of any formal submission to arbitration, but an express intention of avoiding the use of an arbitration clause. The clause referred to matters which the engineer had to decide from day to day, as when work had been done improperly and should be done over again, whether the proper materials had been used, and matters of that kind. The engineer's office was an administrative one. In matters of administration his word was law, but his lordship did not think the clause was an arbitration one intended to put the engineer in the position of arbitrator and justifying them in depriving plaintiffs of their right of appealing to law. When the action came on, however, defendants would retain all the rights they might otherwise have under the clause.—The Court refused an application to stay the action to allow the Corporation to consider the question of an appeal to the House of Lords on the point now decided against them. During the hearing, the point was raised whether, had the clause been held to be an arbitration clause, there would be any power to override it.—Lord Justice Vaughan Williams expressed the opinion that if there was good reason, having regard to events which had occurred, to think that justice might not be done in an arbitration, the Court might, in the exercise of their discretion, override such a clause in a contract.

Jackson v. Romford Rural District Council.

The plaintiff was employed by the defendant to lay twelve-and-a-half miles of sewer across the Essex marshes at Degenham, and construct an outfall in connection therewith. The claim in the action was for £10,000, the value of this work. The contract price for the work was £17,600, and the plaintiff claimed on the construction of the contract and specification, and the drawings which were included in it, that he had contracted to build a sewer in a dry soil, and at a specified depth, and that it was not necessarily to be water-tight. It was subsequently found necessary to alter the original levels in many places, and the result of the sewer having to be laid at different depths was that instead of its being laid in a dry soil, it had to be laid in running silt or sand. There were also other deviations required in the quantities, and timbering had to be done in the excavation. Two hundred and eight manholes were also specified for, but it was not specified that they should be made in concrete, whereas 198 of them were, in fact, made in this material. The result of all this was that a fresh contract was entered into on August 15th, 1905, under which further difficulties arose, and the defendants sought to make the plaintiff liable for the cost of works necessary to put things in order, and delays occurred by reason of the defendants being unable to obtain easements for the construction of the sewer. After lengthy negotiations, the writ was issued, and the defandants admitted £2,000 odd to be due to the plaintiff over and above what had been paid, subject to the satisfactory completion of the work and their counter-claim, but disputed the remainder of the claim, amounting to £7,000.—Mr. Muir Mackenzie (Official Referee), in delivering judgment, stated that the plaintiff's first contention was that the work specified had, by the direction of the defendants' engineer, been so completely altered that he was ordered to carry out, and did carry out, a work which was different in itself from the work indicated in the specification and quantities on which he based his tender, and had to be carried out in circumstances different from those which he reasonably expected to arise. A sewer laid at the contract depth would have been, if not in dry ground, in much less wet ground than he actually encountered. He found, as a fact, that the depths from the surface at which the sewer was laid, were in places different from the depths specified, and that in itself necessitated a variation in the amount of excavation. There were also variations of route. Each party went on in ignorance of the soil, and knowing that these were contractors' risks. The plaintiff went on sending in his account, and charging for extra work occasioned by changing circumstances, and never protested that he considered he was doing a different job, and no opportunity was given to the defendant Council to consider an altered position. He also found that there was no evidence from which he could infer that there was such a change of work that a contract to pay its value, day work and materials, could be implied. Any case of representation was met by the case of "Thorn v. the Mayor, etc., of London," 1 App. Cas., 120, and therefore he decided that the plaintiff's claim on this basis failed, and that it was sustainable only for the contract price plus extras. If the work was, in fact, so changed as to be a different one, there would be the difficulty of implying a contract to pay for it, as the engineer had no authority to make such a contract for the defendant Council. The case of "Lawford v. Billericay Union," 1903, 1 K.B., 772; 67, J.P., 245, would not quite meet this case, as mere acceptance of extra work does not of itself involve a contract to pay for it, when the employer has specially guarded himself by limiting the authority of his agent, and stated in his contract the only conditions on which he will pay for work other than contract work. With regard to the defendants' contention that the work was not completed, and that it was not done to the satisfaction of their engineer, the work had been done as the defendants' representative on the spot had ordered it. He must therefore find that the plaintiff did complete the work in accordance with the specifications and sections as varied by the defendants' orders, and therefore the defence of non-completion failed. Then there was a technical difficulty with regard to the extra work, because by the contract the defendants were only liable for extras ordered in writing by the surveyor or clerk of the defendant Council. These orders in writing were a condition precedent, and there were numerous cases which showed that where there was such a condition pre-

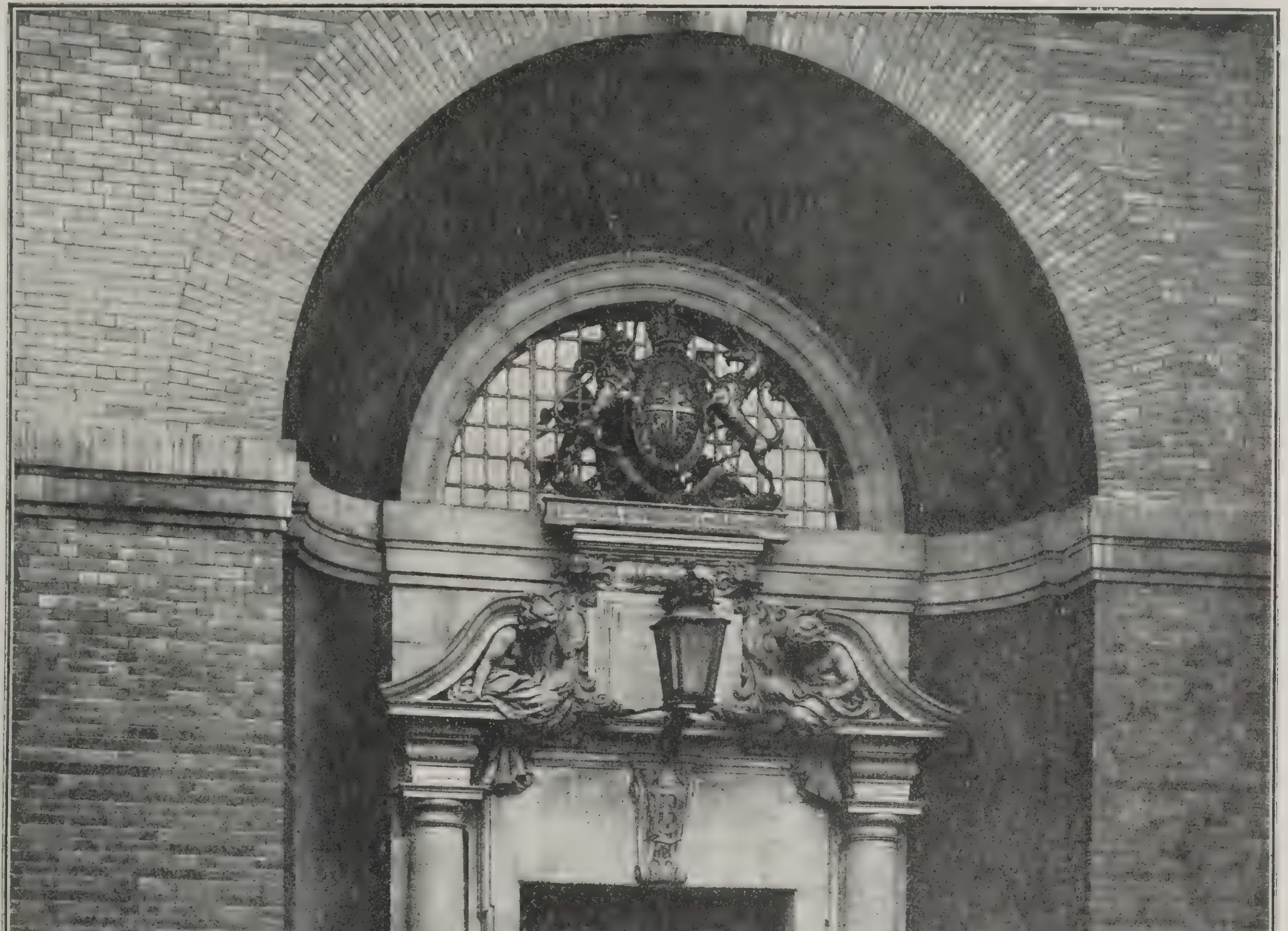


Photo: *Arch. Review.*

ENTRANCE DOORWAY, BOVRIL WAREHOUSE AND OFFICES. H. V. LANCHESTER, F.R.I.B.A., ARCHITECT, WITH ASSISTANCE FROM E. A. RICKARDS, F.R.I.B.A.

This doorway, which has been much admired, is on the Old Street façade of the building, which is faced with deep red glazed brick and Portland stone dressings, and cast-iron panels between the windows on the second and third floors.

cedent, and it was not waived, no liability for extras to the specified work arose. Where the certificate was final and given, the employer could not dispute liability for sums certified to be due on the ground that the certificate included extra work for which no written order had been given. The defendants pleaded there was no final certificate, and therefore it became the referee's duty to decide on the question of extras. Of these certain must be allowed the plaintiff, and others disallowed; and amongst the latter the large claim for repairs, as the plaintiff should have got a definite arrangement with regard to them. He must grant judgment for the plaintiff for £3,400 damages, and as the plaintiff had succeeded on one issue, but failed on two, and "set-off" of costs was inconvenient, he would allow the plaintiff three-quarters of the costs.

Mr. Maurice E. Webb, elder son of Sir Aston Webb, C.B., R.A., F.R.I.B.A., was married at St. Mary's Abbots, Kensington, on Thursday last to Miss Dorothea Margaret Besant, elder daughter of Mr. Edgar Besant.

* * *

Mr. McKenna, in answer to a question in the House of Commons by Major Anstruther-Gray, stated that 573 men are now employed at Rosyth, and that in March next this number will probably be increased to about 2,000.

* * *

"Quantities and the Quantity Surveyor from an Architect's Point of View" is the title of a paper to be read by Mr. William Woodward, F.R.I.B.A., F.S.I., at a meeting of the Quantity Surveyors' Association, at Caxton Hall, Westminster, on Wednesday, November 10th, at 8 p.m.

* * *

At a special general meeting held on October 26th, at the Builders' Institute, Bedford Street, Strand, W.C., Mr. Leonard Horner, president, in the chair, an election for two eligible candidates to be placed on the pension list took place, with the result that Mrs. Cocks polled 915 votes and Mr. Robinson 733 votes, and both were elected. The addition of the two new pensioners brings the number of those receiving (in the cases of widows)) £24 per annum and (that of aged clerks) £30 per annum respectively to 31, a large total, for whom the hardworking president and committee have to get donors and subscribers to provide funds. At the close of the election the committee voted £2 each to the unsuccessful candidates as temporary relief on account of the expenses incurred by them in canvassing for votes. A very hearty vote of thanks to Mr. Leonard Horner was proposed and carried. The secretary is Mr. John Austin, and the offices are at 21, New Bridge Street, Blackfriars, E.C.

Coming Events.

Friday, November 5th.

Society of Engineers, Caxton Hall, Westminster.—Dr. David Somerville, on "The Chemistry and Bacteriology of Sewage Purification," 7.30 p.m.

Tuesday, November 9th.

British Museum.—Mr. Banister Fletcher, F.R.I.B.A., on "Greek Architecture," 4.30 p.m.

Institute of Sanitary Engineers.—Mr. A. J. Martin, M.Inst.C.E., on "Scavenging and Disposal of Refuse" (Students' Lecture), 7 p.m.

Wednesday, November 10th.

Quantity Surveyors' Association, at Caxton Hall, Caxton Street, Victoria Street, Westminster, S.W. Mr. William Woodward, F.R.I.B.A., F.S.I., on "Quantities and the Quantity Surveyor from an Architect's Point of View," 8 p.m.

Manchester Society of Architects.—Mr. R. Weir Schultz, on "Practical and Theoretical Training."

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION
Nov. 24.	GARDEN CITY PLAN, BURY, LANCS. In connection with the forthcoming exhibition of cottage designs in the Bury Art Gallery, the Bury Housing and Town-planning Association offer three prizes for a design for laying out a garden city suburb within the confines of the Borough of Bury. First prize £5; second prize £3; third prize £1 10s. Designs should be sent to Mr. H. Townend, Curator, Art Gallery. Bury, Lancashire.
Nov. 30.	HERNE BAY PAVILION ON PIER. Herne Bay Urban District Council invite competitive drawings for a pavilion to be erected on the proposed extension of the pier at a total cost not exceeding £4,000, exclusive of architect's commission. Premiums of twenty-five guineas and ten guineas. Plan of the site and copy of the conditions may be obtained from J. Jubb, Clerk to the Council, Town Hall, Herne Bay. Deposit: one guinea.
Nov. 30.	TECHNICAL AND SECONDARY SCHOOL, WORKINGTON. The Cumberland Education Committee invite architects to submit sketch plans with outline specification and estimate for a technical and secondary school in the Borough of Workington, Cumberland, for about 300 pupils of both sexes. Further particulars and conditions upon which plans will be received may be obtained from the undersigned on receipt of a stamped and addressed foolscap envelope and the payment of a deposit of one guinea. Deposit returned if all papers sent are returned within seven days. C. Courtenay Hodgson, Secretary, The Courts, Carlisle.
Dec. 1.	PUBLIC PARK PLAN, BANGOR (COUNTY DOWN.) The U D. Council offer a premium of £30 for the best scheme for laying out a public park, twenty acres in extent. Premium to include all expenses of successful competitor whose designs become the property of the Council. Schemes to J. Middleton, Town Clerk, Town Hall, Bangor, County Down.
Dec. 18	TRAINING COLLEGE FOR TEACHERS, Kirkstall Grange, Far Headingly. Leeds. Architects practising in Leeds are invited to submit competitive designs for the above College. Sir Aston Webb, C.B., R.A, F.R.I.B.A., has been appointed Assessor. Copies of the conditions of competition and instructions, a plan of each floor of the educational blocks and of the hostel blocks, also an estate plan, showing a suggestion for grouping the various buildings may be obtained from James Graham, Secretary for Education, Education Department, Leeds. Designs to be delivered not later than 12 o'clock noon. Deposit: £2 2s.
Jan. 31 1910.	NATIONAL MUSEUM OF WALES. The Council desires to receive competitive designs for the erection of a new National Museum at Cardiff, Three premiums are offered of £200, £150, and £100, for second, third, and fourth. The Council have appointed Sir Aston Webb, R.A., Mr. John J. Burnet A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A., as Assessors. Particulars and plans of the site will be supplied to competitors on payment of a fee of £2 2s., returnable if all papers are returned within 14 days. Inquiries to be addressed to Dr. Wm. Evans, Hoyle. Director of the Museums. City Hall, Cardiff.

Warrington Elementary School Competition

Members of the Royal Institute of British Architects are requested not to take part in the above competition.—By order of the Council, Ian MacAlister, secretary.

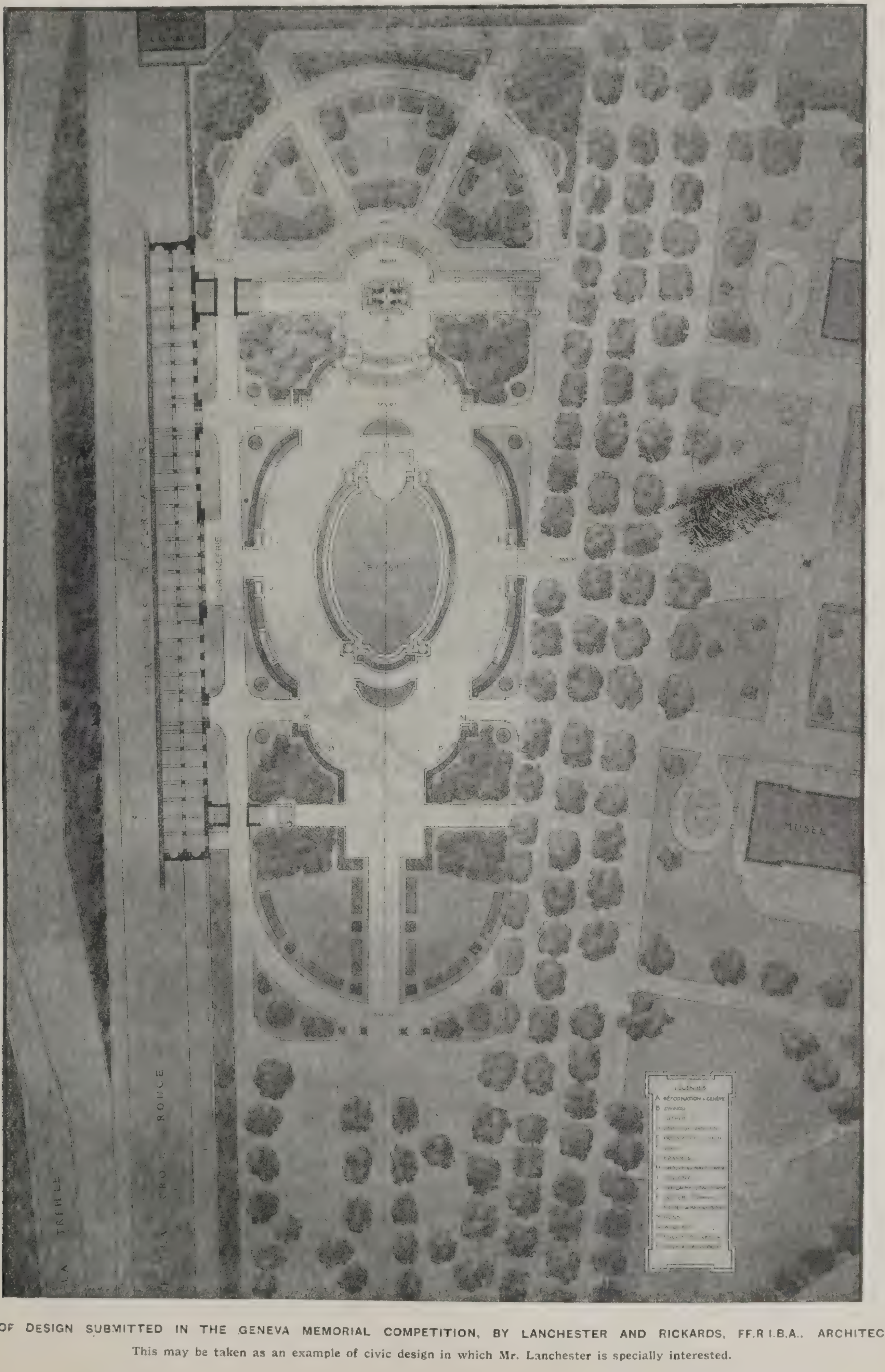
Middlesbrough Library.

Messrs. Hoskins and Brown, Kitching and Lee, and W. H. Bourne, have favoured us with copies of counsel's opinion, which, acting on behalf of eighty-three of the competitors, they have obtained with regard to this competition. The counsel consulted were Mr. C. A. Russell, K.C., and Mr. C. E. Brackenbury. Mr. Russell says: "In order to establish a cause of action, the unsuccessful competitors must show that there is an undertaking by the committee either (1) that only such designs as complied with the 'Instructions' should be submitted to the assessor; or (2) that the assessor in making his award would disregard all designs which did not comply with the Instructions; or (3) that the assessor would correctly decide the question whether a design did or did not comply with the Instructions, I am of opinion that no such undertaking can be derived from the advertisement or Instructions." He is therefore of opinion that the unsuccessful competitors have no right of action against the Council or committee. With regard to the assessor, Mr. Russell is of opinion that as there was no contract between him and the competitors, there is no cause of action against him. Mr. Russell believes that there might be a remote possibility of having the award set aside if the case could be brought under the Arbitration Act, although he thinks this course would be difficult, and that in all such cases "the only effectual protection of the competitors is the competence and fairness of the assessor." Mr. C. E. Brackenbury is also of opinion that the unsuccessful competing architects have no cause of action. He lays stress on the proviso that "the judgment of the assessor was to be final," and on the expressed opinion of the assessor that in his judgment the authors of the successful plans had complied with the spirit as well as the letter of the conditions. Counsel, examining in some detail the grounds of complaint, seems disposed to agree with the assessor's view, and does not find "any sufficient evidence to support the unsuccessful competitors' view that 'the award was given to a design which did not comply with the conditions as laid down by the Council,' or that there was any 'wholesale violation' or 'direct contradiction' of the conditions." He thinks it unfortunate that any question of verbal construction or legal interpretation of instructions should have arisen, but that this was perhaps unavoidable.

International Architectural Competition.

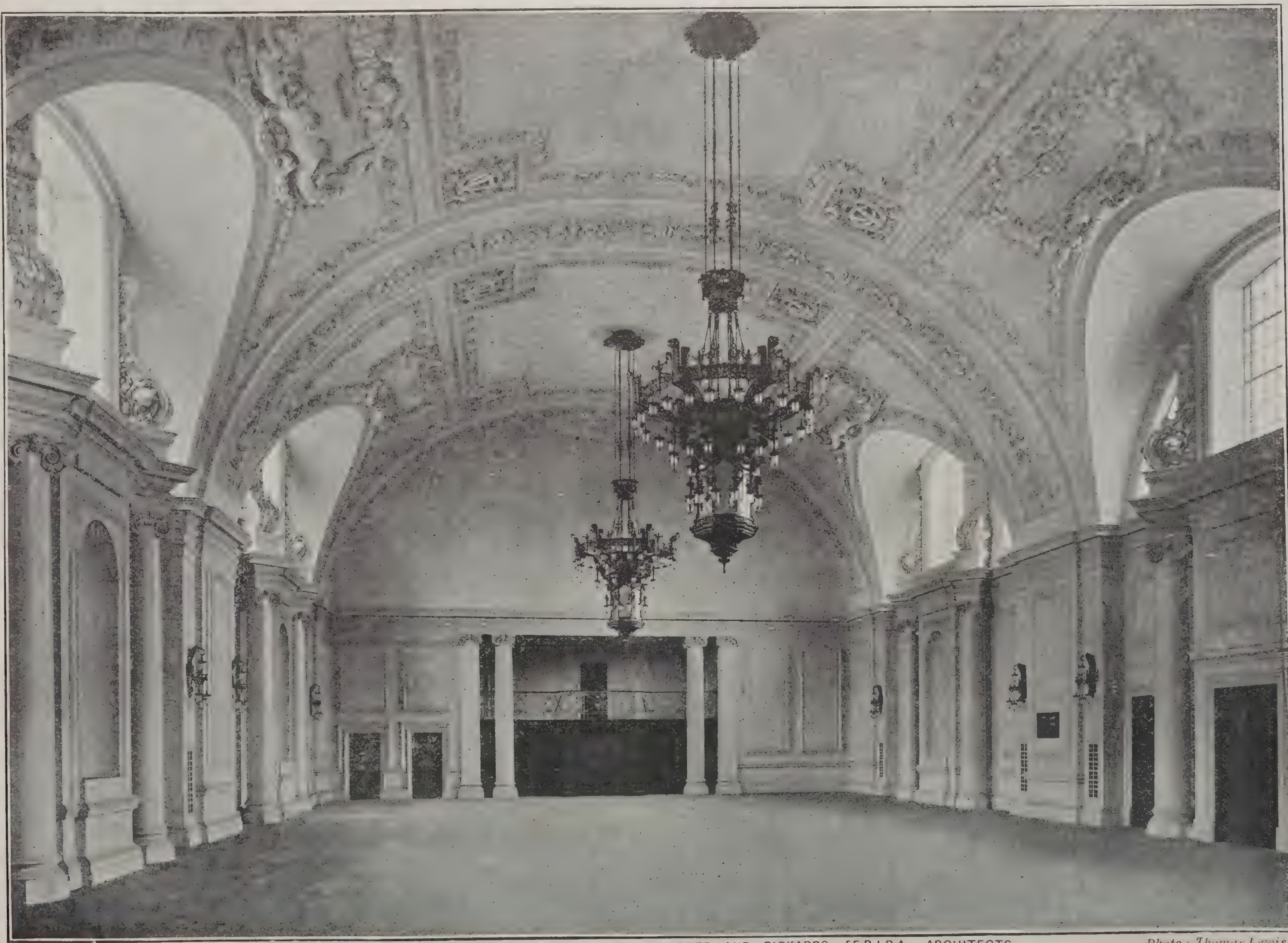
Together with the general regulations for the 1911 International Art Exhibition at Rome, the special regulations for the International Architecture Competition have been published in the principal European languages. This competition is open only to foreign States, to whom the choice of the architects and of the models of buildings is exclusively reserved. Its purpose, as well as that of the National Competition, reserved to Italian architects and builders, is to mark the progress that has been made during the past thirty years in the design and decoration of dwellings. Three prizes, of 150,000, 100,000, and 50,000 lire each, are to be awarded. An International commission of judges, named, partly by the competing States and partly by the presidency of the committee, will award the prizes. Foreign States who intend taking part to the competition will have to forward a formal declaration to the Presidency of the Committee before December 15th, 1909. The allotment of the areas will take place on December 31st. All communications concerning the International Architecture Competition should be addressed to Presidenza del Comitato per le Feste Commemorative del 1911, Sezione Belle-Arti, Piazza Venezia 11, at Rome.

In the House of Commons on October 25th, when the House resumed the consideration of the Land Bill in Committee, an amendment to Clause 35 (exemption of land held by local authorities), was moved by Mr. Austen Chamberlain, who explained that it had been designed for the protection of garden cities. It provided for the exemption of "any body corporate recognised by the Treasury as working for public utility, and not dividing any profit to its members other than a limited rate of interest approved by the Treasury in each case." The amendment was negatived without a division.



PLAN OF DESIGN SUBMITTED IN THE GENEVA MEMORIAL COMPETITION, BY LANCHESTER AND RICKARDS, FF.R.I.B.A., ARCHITECTS.

This may be taken as an example of civic design in which Mr. Lanchester is specially interested.



CITY HALL CARDIFF: THE ASSEMBLY HALL. LANCHESTER AND RICKARDS, FF.R.I.B.A., ARCHITECTS. *Photo: Thomas Lewis.*

The plaster work on the ceiling of this hall was executed by Mr. G, P, Bankart, The electric light fittings are of bronzed wrought-iron; they are exceptionally elaborate and weigh as much as a ton each; they are suspended by special gearing and can be lowered when required.

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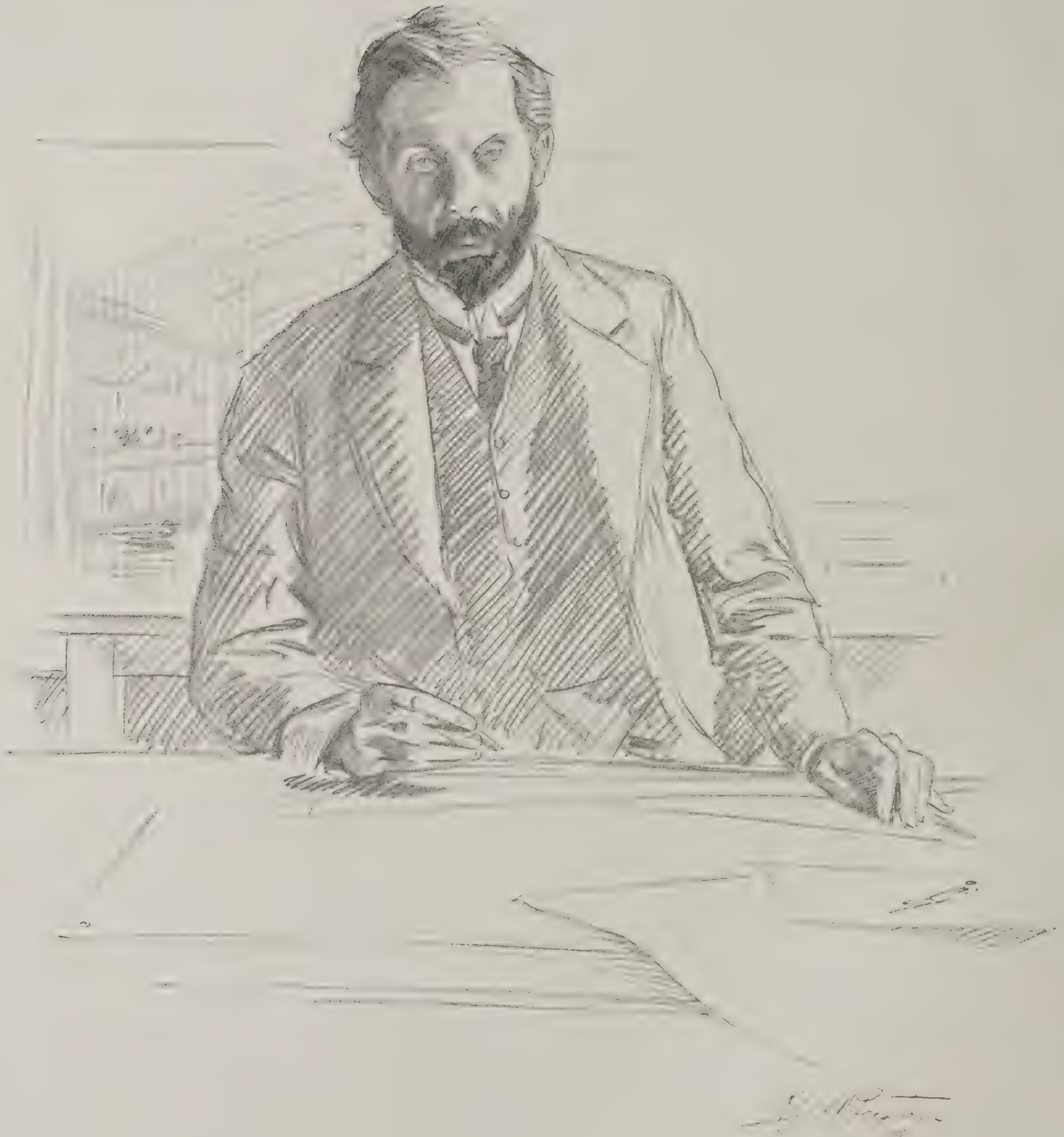

MR. HENRY VAUGHAN LANCHESTER, F.R.I.B.A.

ARCHITECTS OF THE DAY—VI. & VI

Sketched from life

MR. EDWIN ALFRED RICKARDS, F.R.I.B.A.

SSRS. LANCHESTER AND RICKARDS.
Special Artist.

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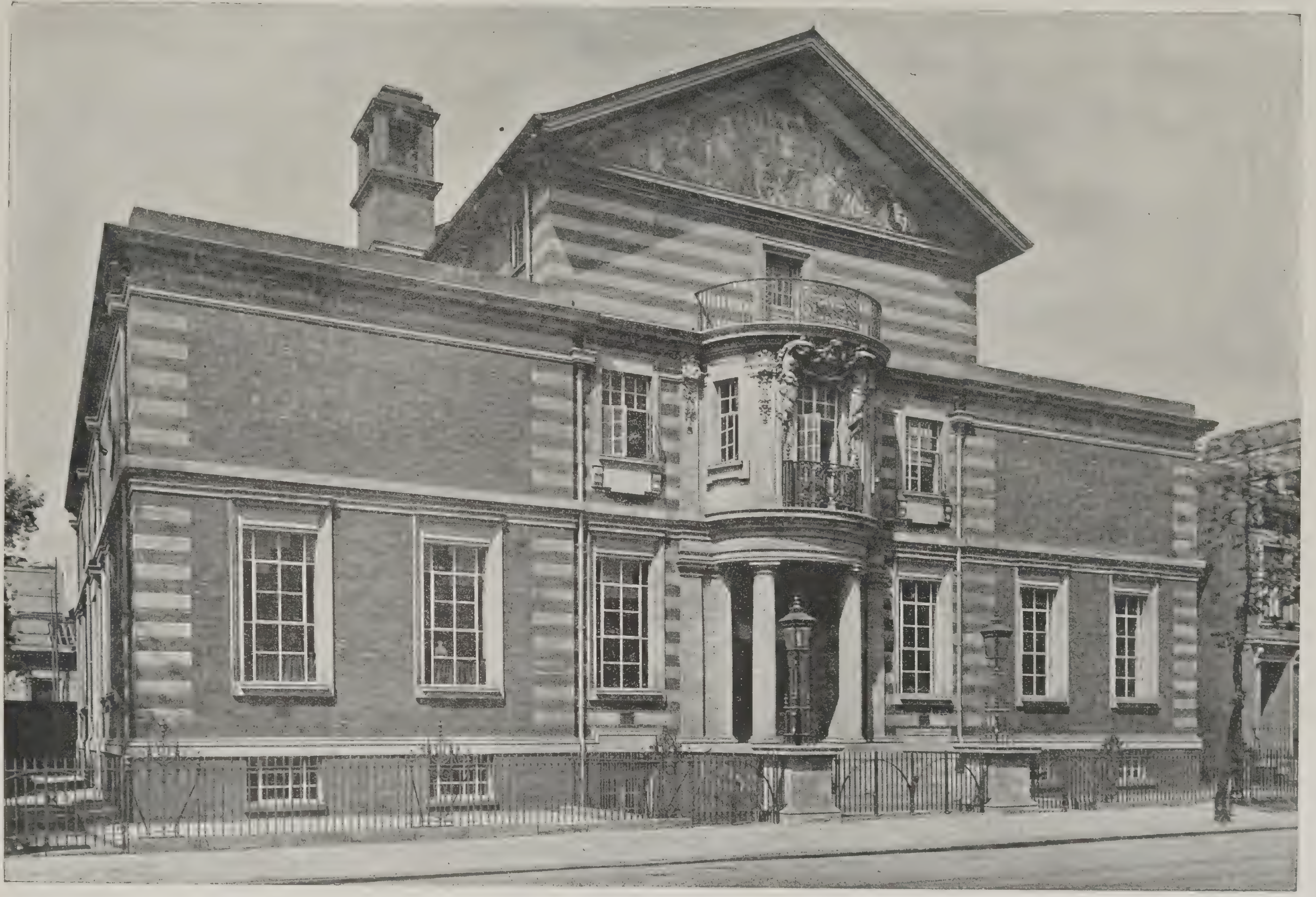


Photo: Bedford Lemere & Co.

HULL SCHOOL OF ART. LANCHESTER AND RICKARDS, FF,R.I.B.A., ARCHITECTS.

The elevations are in red brick with Portland stone dressings. The sculpture is by Mr. H. C. Fehr, and the mosaic panel was executed from cartoons by Mr. Alfred Garth Jones.

R.I.B.A.

The seventy-fifth session—1909-1910— was opened on Monday evening, when Mr. Ernest George delivered his Presidential address as follows:—

We meet to-night at the opening of the seventy-fifth session of our Royal Institute, and it has been the custom on such first nights for the President to make his oration, and you listened with courteous patience a year ago to my expression of sentiments and views about architecture and the concerns of our calling. My words to-night shall be few, for, happily, we have a more distinct interest in gathering here, perhaps overcrowding our room. Our numbers and our needs have outgrown the accommodation. It is a satisfaction to be able to state that after a few months we shall be suitably housed, spreading into the adjoining galleries that we have long coveted and in which will be our lecture theatre. This library will no longer be deranged for sessional meetings. The pictures, our precious possessions, which are now skied and which are deteriorating in the upper region of exhausted air, will be hung in a becoming light, doing justice to their distinguished painters and to our past presidents. Our collection will shortly be made richer by the fine portrait of our late president from the hands of Mr. Cope. We shall be able to receive our guests with comfort and propriety without the present struggle for tea and toast. Also we shall have room for the exhibition, under our own roof, of the studentship drawings and of other collections that may be desirable from time to time.

In our art we do not make history so rapidly that there is a new story to be told each year. Progress, I believe, is steadily making—the result of sound training in our schools and of a truer appreciation among ourselves of the principles of building and design. There is a growing desire for breadth and largeness of treatment rather than for pretty detail and the trivialities that once interested architects and their public.

We must report l'Art Nouveau as already in a moribund state, and happily we have not been startled by a later invention. We are seldom asked now why architects do not originate a style. Those who have followed the history of the art know that each style, seeming distinct, has been the result of growth, changes coming by degrees, sometimes by assimilation of foreign forms, as well as in variations of detail at the hands of the cunning craftsman, who yet held to the traditions in which he moved.

Such changes have at times been accelerated, as when the influence of the revived Greek and Roman art spread through northern Europe, and men of genius made new melodies on the old chords. Yet the giants of those days did not claim to have invented styles. To meet constantly changing requirements and to accept new methods of building, evolving new modes of treatment, will give vitality to modern work which must not resuscitate old models. I give my humble opinion that the average work of architects now is better than it was even several years back, one advantage being that there is less diversity and a more general acceptance of a common style. There is the desire to fall into line rather than for strong self-assertion. Forty years ago, if we had a street frontage to deal with, a first thought was "Shall it be Gothic or Classic?" Now the feeling is that it should harmonise with its surroundings; better than the latter if possible, but not with a clash or discord.

For the carrying out of our work we have in this country admirable builders, and I am glad to state my experience in this matter. We have also the British workman, who is often spoken of slightingly, and perhaps with justice when known only through the demagogues who are too often his mouthpiece. We have craftsmen and workmen equal to the best. For these to have any independence and strength it was found necessary to combine and form Unions, and these have been helpful in preserving the men's rights. We have, however, to lament the short-sighted policy of these Unions in suppressing the individuality and self-reliance of the man. The intelligent mechanic, with skill and energy, must receive no higher wage than the wastrel; he must not work an hour longer, nor must he do more work in the hour. He is robbed of all ambition and of the possibility of improving his status. Our politicians on both sides of the House avoid this home truth, and discuss other ways of making our workers compete with skilled and industrious toilers in other countries. They do not say that the law the man makes for himself stultifies him and excludes him from the labour market. These artificial conditions of labour have also made the housing of the working man almost impossibly costly.

The future of our art is in the hands of the young men now in our offices, or in the good schools where a training is given much more thorough than could be had a generation ago. We are able to take stock of these future architects annually at the gathering of students' drawings in competition for our medals and prizes. The work shown last winter perhaps exceeded in quantity the product of previous years.

An effort is being made to give direction to the studies of those who go out with our awards, so that time may be spent to the best advantage among the great examples; precious time has sometimes been wasted in miscellaneous and objectless sketching for want of a defined purpose in travel.

One of the aims that we have before us is the founding of a British Architectural School of Rome, the presentation to which would be our highest academic prize, and I am glad to say that this scheme has ceased to be in the clouds. Time and thought have been given to the subject, and much information gathered. A special committee has struggled with the problem, and our able friend Mr. John Simpson has drawn up a practical working basis for our consideration.

It has further been proposed by Sir Brumwell Thomas that we should have a "Diploma School"—a school where architectural study would be carried further than in the ordinary course of training or apprenticeship, and on men from this higher grade our "Prix de Rome" would be conferred; this would be equivalent to a prize Fellowship, giving leisure for higher culture.

It has but lately been realised how important is the study of civic design and town planning. It does not fall to our lot in the old country to scheme new cities on noble lines. We have, nevertheless, most of us seen familiar places change their aspect by degrees, often with lamentable result. There is now a general desire that new quarters of the town and new streets shall not come haphazard and by accident, but shall be the result of forethought, and part of a comprehensive plan with consideration of possible future needs. Architectural effect is to be studied as well as convenience and economy.

These matters have been till now left to surveyors and engineers. The study of such important problems will in future be brought before our architectural students, and, by the generosity of Mr. Lever, the Liverpool University is the first to enjoy a professional chair for this special study.

A group of able men among our Institute members form a Committee for the study and elucidation of this subject, and we have had the advantage of addresses here and of essays in our Journal and elsewhere, giving the results of their research. This Committee is also considering the proposal to organise a Conference of those interested in the work of Town Planning.

We are glad to realise that something has been done to reform suburban life from its monotonous environment. "Port Sunlight" perhaps was the earliest effort to supersede the usual rows of machine-made workmen's dwellings by groups of cottages with character and individuality, these having their outlook on a garden or green instead of always on the street.

The Garden Suburb at Golder's Green, Hampstead, is another happy growth on somewhat similar lines. It has been laid out with skill and judgment, the several roads or vistas taking advantage of any points of interest in the view. Ugly "backs" are avoided, the cottages being made seemly all round. There are dwellings for workmen, also accommodation suited to clerks, while there are larger houses for those of larger means. The desire has been to avoid an unrelieved and dreary aggregation of one class.

Another oasis, in a district with no natural attraction, is formed by a gathering of suburban villas, built by Mr. Willett, to the north of Regent's Park. These are by various architects, and they are happily grouped in relation one to another; instead of fences their forecourts or front gardens are enclosed by neatly clipped yew hedges, outside which is a well-shorn grass margin to the road, and this is not harmed by traffic or the passer-by. Looking from these houses or at them the aspect is pleasant with an air of the country and of Kate Greenaway; we wish every success to such speculative building.

We have seen changes come, mostly for the better, in our own great city, while probably greater alterations must follow. Let us prepare for these.

Between the City and Southwark is to a new "St. Paul's Bridge." This is a matter of vital interest, and we trust that with collective wisdom and good judgment we may have a fine architectural feature, with well studied approaches. Is there any reason why a Thames bridge built now should have less dignity and propriety than London Bridge and Waterloo Bridge? Is there not a shoddy and commercial appearance about most of the later attempts to span the river—a lack of monumental fitness? The bridges of a great city are the features that most impress the mind and remain on the memory.

While speaking of the City I would refer to the Guildhall, with its record reaching back to the days of Henry IV. The interesting crypt and the masonry of the walls remain, but generations of pottering have left little else. Even the late front by Dance has been mutilated. To meet modern wants great changes and rearrangements are to be made shortly, and we trust the best advice and the best possible scheme will be secured for this work. There is also a minor project for building kitchens, etc., now, to the disfigurement of the building, without reference to the future scheme. We would beg the Corporation to defer this work until they have decided on a comprehensive plan. Such halls are of national—I might say international—interest considering their wide hospitality. Some of my friends here will remember how the Burgomaster of Vienna last year, at the Architectural Congress, feasted a thousand of us in the Great Hall of the Rathaus.

In England we get fewer opportunities for architecture on a grand scale than is afforded in other countries. With our Continental neighbours a provincial railway station is made an occasion for an architectural feature; with us we demand only a restricted amount of accommodation and of convenience. The work of a post office is carried on perhaps in half of a grocer's shop, while in a French town the Bureau de Postes would house its officials in a structure with some magnificence.

Just now interest is taken in a scheme for a Playhouse as a fitting memorial to our great dramatist. I hope this may be realised on a dignified scale.

It is strange that while music and musicians have encouraging support here we cannot have an Opera House adequate to our important city. It is not in us to emulate Paris with its Place de l'Opera, where architects, sculptors, and painters have enjoyed a free hand. Here the State is not expected to help in embellishments of the capital. Great demands are made upon her just now, but the desire is rather that she should take a grandmotherly interest in our private and domestic affairs.

(Continued on page xxi.)

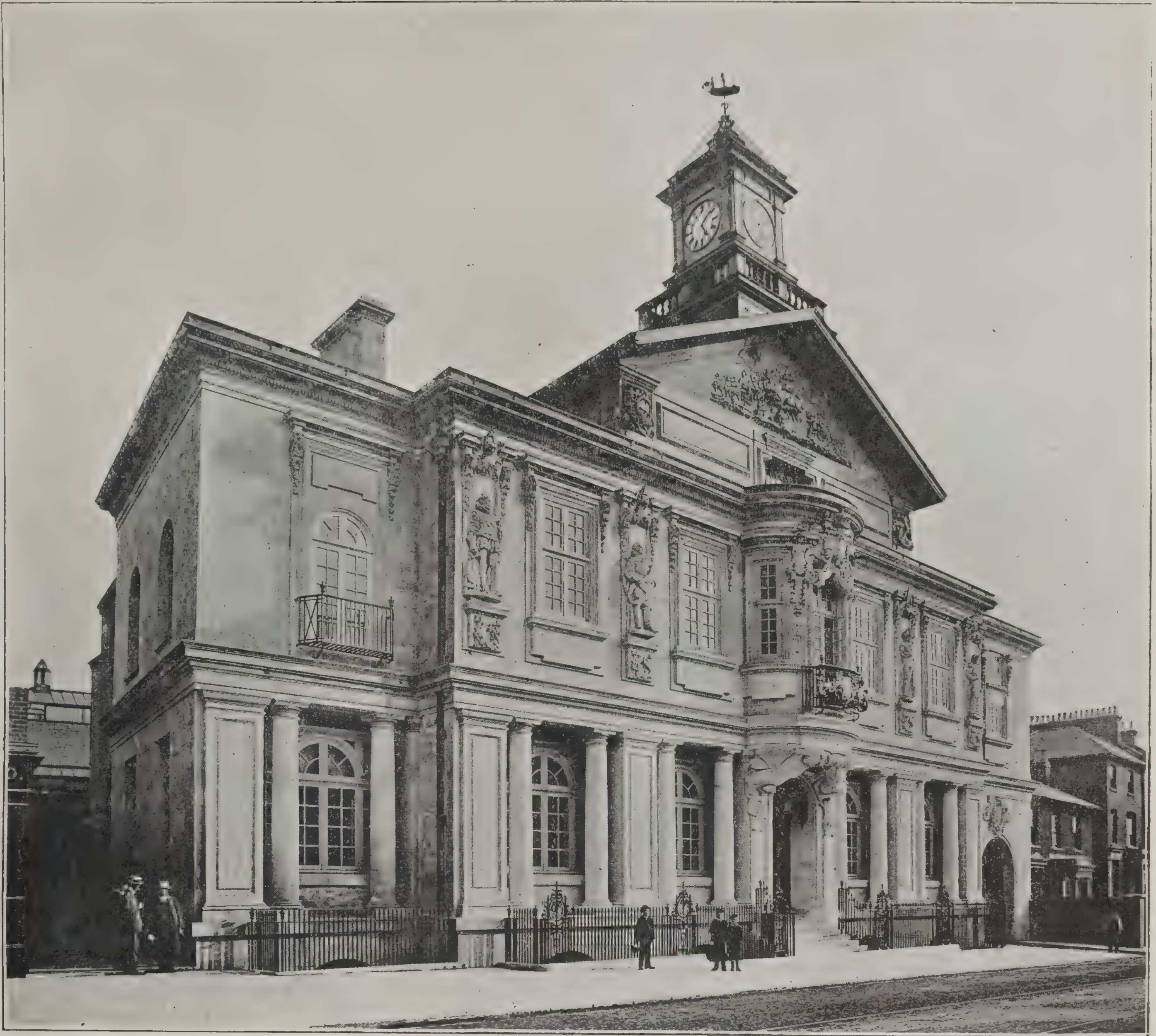


Photo: Bedford Lemere & Co.

DEPTFORD TOWN HALL. GENERAL VIEW OF THE FACADE. LANCHESTER AND RICKARDS, FF.R.I.B.A., ARCHITECTS.

The façade is built of Portland stone, and the sculpture is appropriately connected with shipping with which Deptford is connected. The four figures by Mr. Henry Poole are those of Admirals Drake, Blake, Nelson and a contemporary officer. They have accessories in the shape of ships of corresponding periods The central bay sculpture is by Mr. Albert Hodge.

Proposed New Works.

ABERDEEN.—Plans to an estimated value of £8,500 have been passed. These include eleven new cottages in Clifton Road, four dwelling-houses in Richmondhill Road, a timber store in Ashvale Place, and alterations and additions to Seabank House.

ACTON.—Acton Council has given instructions to its clerk to negotiate for the purchase of a number of acres of land at North Acton upon which to erect workmen's dwellings on the garden suburb style. It is proposed to erect for the present 200 houses either in pairs or in threes, 15 to every acre of land. The houses will have five rooms and bath room, and let at from 6s. 6d. to 8s. 6d. per week inclusive. Councillor J. Shillaker, the promoter of the scheme, said that houses could be erected for £400 the pair, including architect's fees. These would have gardens from 60ft. to 100ft. in length.

DERBY.—The application of the County Council for sanction to borrow £8,000 for the purposes of purchasing certain property opposite the existing offices to be utilised in the extension of the present limited accommodation, has been the subject of a L.G. Board enquiry. The cost of the buildings is estimated at £12,000.

EDINBURGH.—The proposed re-building of the Royal (Dick) Veterinary College on a new site at the east end of the Meadows has been considerably assisted by the formal decision of the Scottish Education Department to recognise the College as a central institution under the Education Act of 1908, and to provide up to £25,000 a sum equal to the amount raised locally, towards the cost of the new building. The College, which is the oldest of its kind in Scotland, is more largely endowed in respect to its Chairs than any veterinary institution in the kingdom. The site is estimated to cost £8,750, and the new buildings £41,250.

ESHER.—The King has forwarded a donation of £50 towards a fund being raised for repairs to the roof of the old parish church of St. George's, Esher. The cost of carrying out the necessary repairs to the church for its preservation will be about £300.

FALKIRK.—The Dean of Guild Court have granted warrants for the erection of a large new skating rink, to be built in Hope Street at a cost of between £3,000 and £4,000, a public-house in High Street, and villa residences and cottages in various parts of the town.

FIFE.—Owing to the great development of the Fife coalfields, the erection of larger offices for the Fife and Kinross Miners' Association has become imperative. The plans, which were before Dunfermline Dean of Guild Court recently show a two-storey building. The ground floor is to be occupied as officials' offices, cloakrooms, etc., while on the upper floor are to be situated a boardroom capable of accommodating over 100 delegates, and waiting-room.

LANGLEY MILL.—A permanent church in place of the present corrugated iron building, is shortly to be erected. A site, valued at a thousand pounds sterling, had been given by the Butterley Company—the site facing the Erewash Hotel. Plans for the proposed new stone church have been submitted (and accepted) by Mr. Sydney Brocklesby, of Wimbledon. The estimated cost of the new church is between £4,000 and £5,000.

RENFREW.—During the five weeks ending October 11, plans for the erection of the following buildings had been lodged:—Villa in Woodend Road, Newlands; double villa in Church Road, Giffnock; terrace of 16 cottages in proposed new street on Braidbar Estate, Giffnock; terrace of eight cottages in Mossgeil Road, Newlands; four double villas in proposed new street at Giffnock; additions to the Johnstone and District Cottage Hospital, Elderslie, for the hospital trustees; double cottage at corner of Beith Road and Newton Avenue, Elderslie; four tenements in proposed new streets on Braidbar Estate, Giffnock; double villa in proposed new street on Eastwood Mains Estate; double villa in Southbrae Drive, Jordanhill; two-storey tenement at Brig o' Lea, Neilston; addition to house at Staneley Reservoir, Paisley; and villa in proposed new street off Busby Road, Clarkson. The valuation of the linings has been estimated at £35,860, as compared with £16,050 for the corresponding period of last year.

SCULCOATES.—Plans have been passed for additions to a house at North Ferriby, for the Trinity House, at Westella, at Ferriby, and at The Hall, Kirkella. Plans have also been passed for four houses at Willerby, two houses at Ferriby, and a stable and cowhouse at Sutton.

STOKE-ON-TRENT.—A L.G. Board enquiry with respect to an application by the Town Council for sanction to borrow £700 for the extension of the market yard, has been held. The proposed loan is the estimated sum required for the acquisition of five cottages in Welch Street, their partial demolition, and the conversion of the site for the purpose of extending the yard of the borough market, and for improving the means of access to it. The inspector was also asked to consider an application to the Board for sanction to borrow £300 for a proposed further improvement of London Road.

WATFORD.—The following plans, among others, have been approved by the Urban Council: Five houses, Field Road, for Mr. H. W. Grover; house, The Avenue, Nascot Estate, for Mr. J. R. Cuthbertson; house, Oxhey Avenue, for Mr. A. E. Taylor; detached house, Eastbury Road, for Messrs. Clark Bros.; new skating rink, Clarendon Road, for the Skating Rink Company, subject to conditions; new front and colonnade, Palace Theatre, for the Watford Theatre Company, subject to conditions.

Federation News.

SHEFFIELD ASSOCIATION.

Secretary: T. Smith.

The monthly meeting of Sheffield Association was held on October 14th, when there was a good attendance of members. The president, Mr. W. W. Mears, was in the chair.

The correspondence included a letter from the Yorkshire Federation covering a copy of the amended general rules agreed between the National Federation and the N.A.M. and N.A.O.P., requesting the Association to confer with the N.A.M.P. with the object of appointing the representation. The matter was left over till next meeting, it being desired to confer with other local associations in the meantime. Other letters included a request from the Treasurer of the Yorkshire Federation for further subscriptions, and also contributions to the National Reserve Fund. With respect to the former it was pointed out that for the current year the Sheffield Association had already paid £40 on account, and would probably make a further remittance next month. With respect to the National Reserve Fund, the secretary was instructed to enquire how this was apportioned amongst the various associations in the Federation, and specially to ascertain what was the proportion allocated to Sheffield, which had previously contributed £50. The secretary was also to ascertain what amounts respectively had been allocated and contributed by other associations in the Federation since the inception of the scheme.

The motion in the name of Mr. Forsdike that a uniform rate of profit of 2d. per hour on wages of tradesmen, and 1½d. per hour on labourers be paid, led to a somewhat animated discussion. Mr. Forsdike voiced the opinion of the majority in holding that the rate of profit proposed was fair and reasonable.—Mr. Powell spoke against the resolution.

Mr. Roper seconded the resolution.—Messrs. Brown and Ardern pointed to existing difficulties, but Mr. Belton took the opposite view.

Mr. Biggin thought the proposal reasonable.—Mr. Boot did not see any difficulty.—The President pointed out that the resolution could do no harm, and it would at any rate establish a standard which would be recognised in court if need be. Mr. Moore leaned a little to the opinion of Mr. Powell, but Mr. Forsdike, having pointed out that he was willing to have his motion considered "non-committal," the president put the resolution, which was supported by Mr. Unwin, and carried.—A further resolution moved by Mr. Boot, and seconded by Mr. Unwin, instructed the committee to prepare a list of the various trades to be sent to the architects.

The Secretary, in presenting to the meeting a rough printer's proof of the new Calendar for 1910, remarked that the Sheffield Association had acquired the reputation of being one of the most progressive associations not only in the North, but throughout the country, and they wanted to retain the reputation. To this end the calendar was proposed to be sent out in embryo to such persons and firms as existing members returned on the forms, which would be sent out containing on one side a reference to the inter-trading rule, and on the other provision for the names, addresses and businesses of persons with whom they were trading. The return would be quite anonymous, so that the forms when filled up would not divulge the name of the firm which made it. It was an advantage for the name of a merchant firm to be given by several members.

A report was given of the meeting of the Trades' Committee held the previous evening, when Mr. A. J. Forsdike presided, and there were also present Messrs. W. W. Mears (president), J. Biggin, J. D. Cook, W. Longden, T. Roper, G. E. Powell, Jas. Wilkinson, T. Eshelby, T. H. Gray, Chas. Boot, and G. W. Forsdike. The General Union of Carpenters and Joiners were represented by Messrs. J. H. Blincow and F. H. Kent, and Manchester Order of Bricklayers, Messrs. H. A. Stone and T. Kelly. The Amalgamated Society of Carpenters and Joiners, Messrs. T. Wood, F. W. Lindley and W. Lane, and London Order of Bricklayers by Messrs. J. H. Parker, J. L. Evans and G. Emerson. The meeting arose out of previous meetings held March 5th and June 2nd, which had been called to discuss the advisability of the abolition of walking time. The Association had been compelled to give six months' notice on the 1st September to abolish the walking time rule, and, at the same time, they had given notice for reduction of wages ½d. per hour, and the alteration of any other rule which might be necessary or advisable. To this both the Joiners' and Bricklayers' Societies had replied with counter-notices demanding: (1) Increase of wages ½d. per hour; (2) return to old limit of 1½ miles from Parish Church for walking time, employer to pay tram or train fares beyond that distance, and rule to apply to men set on the job as well as men sent from contractor's place of business; (3) increase in wages for joiners' overtime which would alter present rate of 10d. per hour for first 2 hours to time and quarter, or 11¼d. and present rate of 1s. per hour after first 2 hours for first five days of week to time and half or 1s. 1½d. per hour, and first and second two hours after one o'clock on Saturdays from 10d. and 1s. respectively, and afterwards double time, to time and half or 1s. 1½d. from 1 to 5 on Saturdays; (4) one hour's notice to be given to or by bricklayers on leaving, full wages due to be paid at expiration of such notice; (5) the alteration of any other rule to bring the rules into conformity with the suggestions enumerated.

Mr. Forsdike opened the meeting, and suggested that the secretary should read the reports of the previous meetings, and any correspondence thereon.

The Secretary, having read the reports and letters, suggested that the operatives should explain the position taken up in their counter-notice.

Mr. F. W. Lindley said the chairman had inferred that this question could have been proceeded with under the rules of the Conciliation Board, which rules, he held, did not affect in any way the working rules of the operatives. The Chairman said that that was his impression, and forthwith Mr. Lindley said they had a right to claim 6 months' notice for alteration of rules. In reply, the Secretary read rule 1 of the Conciliation Board, which stated definitely that the Conciliation Board were competent to deal with *all* questions or disputes, and "rules" were there specifically mentioned. On a strict interpretation of rules, he therefore held that the employers or operatives had a perfect right to refer the matter to the Conciliation Board after the lapse of time prescribed in rule 2, though the fact that they had already discussed the matter for more than 6 months, and had now given a further six months' notice was ample evidence that they had no wish to do so.

Mr. Stone thought they might agree with much of what the secretary had said, but he held that the rules of the Conciliation Board were not a substitute for the working rules, and only became operative when a dispute took place, i.e., until the 6 months' notice had expired. Up till then it was a matter of friendly discussion.

The Secretary, in reply, said the matter rested on the misinterpretation Mr. Stone placed on the word "dispute," which, in its ordinary meaning, meant nothing more or less than a discussion in which there was divergence of opinion. The error was made that a dispute implied that there was "bad blood," which was a signification which the word in itself did not bear. There was no denying the fact that a dispute commenced the moment two parties failed to agree, and a dispute therefore commenced with the issue of a notice unless the issuing party knew that the matter would be fully accepted without question by the other side. The matter, however, was, in the present instance, trivial, and did not affect them, and could usefully be allowed to drop.

Mr. Stone, speaking on the main issue, referred to conditions in 1877, when wages were 9d. and walking boundary 1 mile from Parish Church, and there were no trams. Now the boundaries were 2½ miles, with wages 9½d., and car fares cost 2s. per week. If they were to go back to the wages of 1877, it was logical they should go back to the easier conditions then prevailing, with "smoking time." etc.

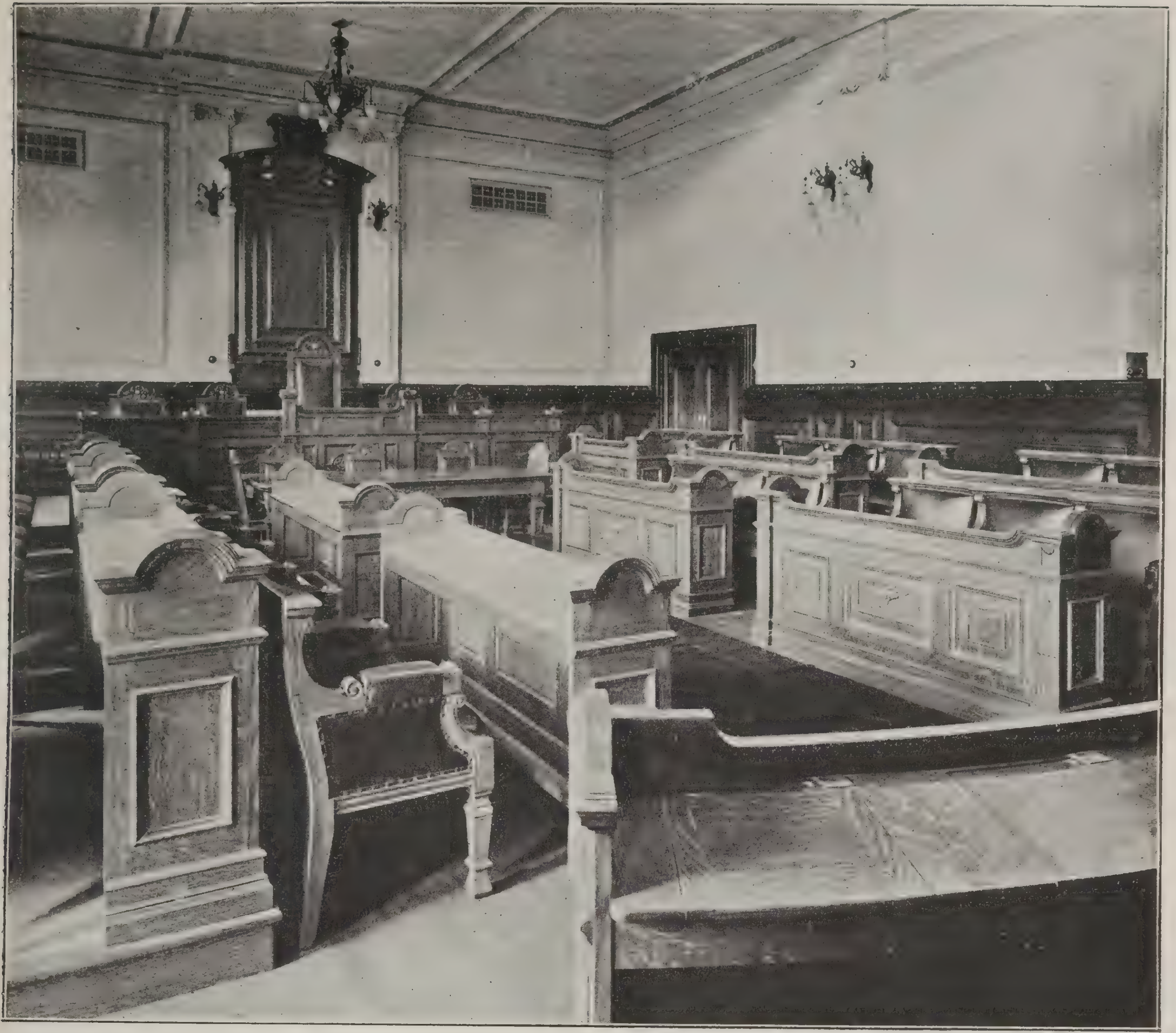
Mr. Wood, while not wishing to say anything in favour of walking time, could not recall a large city where overtime was paid to joiners on such a paltry scale. In asking to be put on same basis as bricklayers—time and quarter for first two hours and time and half after—he thought it would be conceded that their claim was reasonable.

Mr. Stone, in support of advance of wages of bricklayers, quoted the 10d. rate prevailing in Lancashire, but the chairman held that the comparison was unfair, and that Mr. Stone should confine himself to Yorkshire.

Mr. Lane said the walking time they calculated was equivalent to ½d. per hour, and as the masters had said many times that wages were low enough he thought their claim was fair. Other towns were getting a rise of wages, and if the matter went to the Conciliation Board, he thought they would succeed.

Mr. Wood said they wanted it to be distinctly understood that a man commencing in the middle of the week, and working overtime, should be paid overtime rate.

Mr. Evans said that with regard to one hour's notice to bricklayers, there was probably nothing to discuss, as the employers had



DEPTFORD TOWN HALL: THE COUNCIL CHAMBER. LANCHESTER & RICKARDS, FF.R.I.B.A. ARCHITECTS
The furniture here was not designed by the Architects.

already said they would agree to it. The Chairman, in reply, said they were now starting afresh; but in reply to the question direct from Mr. Evans, said that he had no reason to suppose that the Association wished to withdraw. They asked for 3s. per week lodging money on jobs over 4 miles from Parish Church, and return fare once a fortnight, and an increase of ½d. per hour. Would the employers give them ½d. per hour increase if they gave up walking time?

The Chairman, replying on the whole position, said that they were all agreed at that end of the table that this was no time for raising wages. The fact that they had put a reduction of wages in their notice was entirely the operatives' fault. They had fought against it tooth and nail. He would like them to say what proportion of men received walking time, as he thought they took a most extravagant view of it. It was not true that in abolishing walking time they were attempting to reduce wages 2s. per week. The wages would remain precisely as they were, the only difference being that men would get up and work 10, 15 or 20 minutes more instead of being paid for this time in walking or waiting for others to come up, a matter which caused them an enormous amount of trouble, not in contract, but jobbing work, in which the proprietor reckoned up how many hours he was paying for, which were not worked. They were not asking for something which did not obtain in other large towns, and in cases where walking time was paid there was a provision that it did not apply to men set on on the job. At Sheffield, they knew that the rule had not been carried out, and what they wanted was a rule to which they could adhere. He did not think walking time affected 10 per cent. of the workmen, perhaps not 5 per cent.

Messrs. Lane, Wood, and Stone pressed their previous points.

Mr. Biggin endorsed the remarks of the chairman, and proceeded to mention towns where walking time was not allowed. What, however, concerned them the most was the right to compete on equal terms with outside contractors by setting men on on the job without walking time being demanded, and that did not reduce wages one iota.

Mr. Boot said men did not live in the centre of the town, as they used to do, and many times lived in the suburbs where the work was situate. He knew an instance where men paid 4d. a day train fare to a job not outside the boundary, but in such cases, rule or no rule, the matter received considerate notice by the firms who sent the men. The burning question was to find men more employment and increase of wages, and stringent and unfair conditions which increased the cost of work would not do it. In asking for abolition of walking time, they were not wishing to take anything away, but in the main to regularize existing conditions.

Mr. Wilkinson held that the operatives were going directly against their own interests. They had not to consider the individual interest of one side or the other, but how they could jointly face existing circumstances, otherwise they would both go to the workhouse together.

The discussion went on in desultory fashion for nearly three hours, the operatives' representatives claiming a paradox in the statement that the employers held that the walking time was a matter affecting few workmen, while making so great a difference in the aggregate, while they held that what the employers gained the operatives lost, but in this contention they did not take into account the jobs which were altogether lost to local contractors, who lost the profit and the workmen the wages except they worked for outside contractors (as they sometimes did) under conditions they refused to concede to the local contractors.

Mr. Wilkinson spoke of a job taken by an outside builder who was able to quote some £300 less than any builder round that table, and then proceeded to mention a job on which his firm was engaged at the moment which was quoted for on the perfectly honest ground that walking time was not operative, and the result of their paying the men per week extra was that they would lose £137. It was pointed out that Mr. Wilkinson was in this instance recognising walking time in a trade in which it was not operative, but Mr. Wilkinson said he refused to take advantage of a workman and act partially, and he consequently gave the same allowance to stonemasons who were not entitled to it, and to the poor labourer, who was in a similar position, and had no local Trade Society to protect his interests.

The operatives' representatives said they could not go back to their respective societies with nothing to offer in lieu of walking time. Mr. Evans suggested that the walking boundary should remain as it was, and that 1s. per week extra be paid to all men working beyond 2½ miles radius, such advance to apply to Society men only. The Chairman replied that they could not recognise that, and, in further reply to Mr. Evans, they could not recognise it without the reservation as to Society men. In reply to Mr. Lindley, he thought it was a most extreme and extravagant thing to ask for walking time to apply, and all men to start at the same time. It meant that the operatives wished to be paid for doing nothing.

Eventually the meeting broke up with a suggestion from Mr. Stone, which has been subsequently confirmed by letter. "That 1s. per week shall be allowed for car fares to all men working on jobs over 2½ miles' radius up to 4 miles, men to be on the job at the usual starting time; wages to remain as at present." This position the Chairman promised to place before the Association, but it still leaves the other matters unsettled. At the meeting of the Association it was decided that the whole matter should be considered in committee, and presented as a report to next meeting.

NATIONAL ASSOCIATION OF MASTER PLASTERERS.

Secretary: Geo. Soall.

The half-yearly general meeting of the above association took place at the Moseley Hotel, Piccadilly, Manchester, on Thursday, October 21st, the president, Mr. T. Lindley, in the chair. The minutes of the previous meeting, and apologies received, having been read and accepted, the representatives of this association upon the Executive Council of the Confederated Associations of Master Plasterers, Plumbers, and Slaters, made their report upon the recommendation of that body, and that a general meeting of the whole of its members should be held at a suitable date, to consider matters that are of interest to the members in their position of sub-contractors, such as payments, single tendering, etc., etc., and that a resolution from this association be submitted to the meeting.

It was decided to hold the annual general meeting at Leeds.

(*For further Federation News, see page xxi.*)

Law Case.

Waiting for Wages.

In the King's Bench Division, before Mr. Justice Darling and Mr. Justice Bucknill, the case of Harper v. Linthorpe Dinsdale Smelting Company (Ltd.) raised a novel point.

The case was an appeal by the defendants from the decision of the County Court Judge sitting at Middlesbrough. Plaintiff, with other men, had been employed as a bricklayer by the defendants. He was working on night shift, and on January 27 last he was given notice at 5 o'clock in the morning that his employment would end at 6 o'clock. Upon the termination of his employment a sum of £5 4s. 8d. was due to plaintiff, and at 6 o'clock he went to the office of the defendants to receive the amount to which he was entitled. There was no one there to pay him at the time, and he was eventually kept waiting until 10.45, when he received his money. He brought an action against the defendants claiming 3s. 11d. for loss of time owing to the defendants' delay in paying the wages due to him. Evidence was given before the County Court Judge that it was usual to pay the workmen's wages at the expiration of the hour's notice given to them, so that there might be no delay in applying for another job. The County Court Judge gave judgement for the plaintiff for the amount claimed, upon the ground that it was unreasonable to expect him to wait for some hours for his money after being dismissed at an hour's notice. The defendants, as stated, appealed.—Mr. Hedley, on their behalf, contended that the decision of the Judge was wrong. Even supposing that the plaintiff had a legal right to payment at once and a claim for damages if he was not paid immediately, the case of "Tetley v. Wanless" (L.R., 2 Ex., 257) showed that a payment in satisfaction and discharge of a debt was a payment in satisfaction and discharge of the nominal damages to which the creditor might be entitled for the detention of the money due to him. Further, in the present case, there was no evidence of a custom by which the plaintiff might be entitled to receive the amount, or of any contract, express or implied, entitling him to it.—Mr. Lowenthal, for the plaintiff, contended that the fact that the plaintiff was told to wait for his money was sufficient to enable the Judge to imply a contract that he should be paid for the time occupied in so waiting.—The Court allowed the appeal, and Mr. Justice Darling, in giving judgment, said that there was nothing to show that the moment the plaintiff left off work he was not entitled to go away. He had ceased to be the defendants' bricklayer. They were no longer bound to provide him with work, and he was not bound to stay with them. He was entitled to have his money at once, but it was not ready for him, so that if he wanted to take the money away with him he would be obliged to wait. There was no doubt at all that a creditor was not ordinarily entitled to damages because there was a delay in paying a debt due to him, but the law provided in some cases that a creditor should be entitled to interest on his debt, and in other cases he might be entitled to nominal damages for being kept waiting. But it was also a rule of law, laid down by Mr. Justice Maule in "Beaumont v. Greathead" (2 C.B., at p. 499), and recognised and approved in "Tetley v. Wanless," that if a creditor accepted payment of his debt before action, such payment was a payment of the debt, and the nominal damages as well, and thereafter there could be no claim for damages. The plaintiff here had accepted the money due to him, and therefore if he had ever had any sort of right to nominal damages he had sacrificed it by taking the money before he brought his action. It was suggested on behalf of the plaintiff that there was a custom in such a case as the present that if a man was kept waiting for his money he was entitled to be paid for so doing. That was a custom which did not apply to other people to whom money was due. It did not apply to a tailor, for instance, or to a barrister who was kept waiting for his fees. Mr. Lowenthal had frankly admitted that there was no real evidence of such a custom in the present case. Upon what then did he rely? He (Mr. Lowenthal) contended that there was evidence from which it might be implied that the men were to be paid for waiting, although it was contrary to the general law, and there was no custom to that effect. He (Mr. Justice Darling) saw no evidence to support that contention. It was said that the plaintiff was bound to wait until the money was paid to him, but there was no evidence to show that he was not free to go away. He could have come back for his money later, or have sent for it. For his own purposes the plaintiff waited for his money, and he was no more entitled to be paid for waiting, on the evidence before them, than any ordinary creditor who had to wait for his money. He was of opinion that there was no evidence upon which the County Court Judge could found his judgment that there was an implied contract by the master to pay the plaintiff for waiting for his wages, and the appeal must be allowed.—Mr. Justice Bucknill delivered judgment to the same effect.

TO CONTRIBUTORS.

Owing to the very large number of voluntary contributions submitted to the Editor, it has been found desirable to make the following regulations:—

1.—Intending contributors are advised to send a preliminary letter before forwarding articles and illustrations. The non-receipt of a reply within one week is to be taken as a polite negative. MSS. and drawings in all cases should be accompanied by sufficient stamps to cover return postage.

2.—The Editor declines to take any responsibility for the safety or return of contributions submitted, although every care will be taken where these regulations are complied with.

3.—Each MS. and illustration should bear the name and address of the owner or sender.

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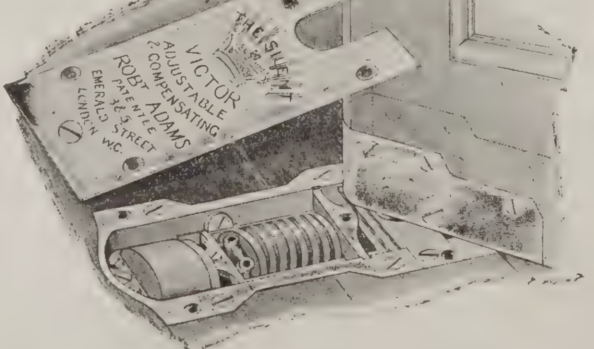

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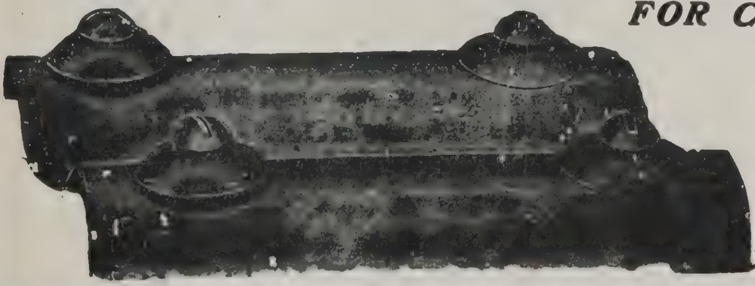

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Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bath.—For heating work at 33, Westgate Street, Bath, for the Bath Chronicle Co., Ltd. Mr. Mowbray A. Green, F.R.I.B.A., Architect, Bath.

G. N. Haden and Sons, Trowbridge	£125
Sydenham and Sons, Bath	115
R. Kendall and Sons, Bath	112
F. J. Blackmore,* Bath	107

*Accepted.

Bath.—For alterations at 4 and 5, Quiet Street, Bath, for Messrs. Walker and Ling. Mr. C. Bryan Oliver, Architect, Bath.

J. Foster, Bath	£499
Hayward and Wooster, Bath	[illegible]
F. J. Blackmore, Bath	469
Long and Sons, Bath	466
Chancellor and Sons*	460

*Accepted

Birmingham.—For new laundry at the Birmingham Workhouse, for the Guardians. Messrs. W. H. Ward, Architects, Paradise Street, Birmingham.

J. Atkinson	£4,250
G. Robinson	4,240
E. Bates	4,160
W. Payne	4,083
W. and J. Webb	4,040
J. Webb, Staffordshire	3,989
T. Elvins, Staffordshire	3,940
W. H. Gibbs	3,900
R. Fenwick, Ltd.	3,883
F. Smith	3,870
J. Barnsley and Sons	3,866
S. F. Swift	3,850
R. Harris and Sons, Staffordshire	3,795
J. Bower and Sons	3,747
W. Sapcote and Sons	3 745
W. Bishop	3,737
H. Taylor	3,735
G. Webb and Son, Staffordshire	3.722
J. Dallow and Sons, Staffordshire	3,676
E. Crowder*	3,447

Rest of Birmingham.

*Accepted.

Bletchingley, near Redhill.—For erection of a new dining hall, etc., at the Workhouse, Bletchingley, near Redhill, for the Guardians of Godstone Union. Mr. Geo. E. Crowter, Surveyor, Godstone.

	£	s.	d.
H. Nott, Whyteleafe	£1,265	0	3
F. and G. Foster, Norwood Junction	1,241	0	0
W. Payne, Lingfield	1,233	12	0
C. Cooper, Warlingham	1,204	0	0
Risby and Mitchell, Caterham Valley	1,163	9	6
J. C. Gorham, Whyteleafe	1,160	0	0
G. E. Everett, Croydon	1,159	0	0
R. Wallis, jun., Merstham	1,154	0	0
S. Jeal, Reigate	1,125	0	0
T. E. Dines, Lingfield	1,123	12	6
O. G. Stanford, Lingfield	1,084	10	7
J. J. Ping Merstham	1,084	0	0
J. Quittenton, Warlingham	1,076	0	0
G. Martin, Redhill	1,053	0	0
J. Smith and Sons, South Norwood	1,037	0	0
A. G. Wright, Purley	1,030	0	0
F. W. Honour,* Warlingham	960	0	0

*Accepted.

Blyth (Northumberland).—For the making of the following streets, viz., Ridley Avenue, Plessy Avenue, Hedley Avenue, and Hunter Avenue, including the sewerage of the same, for the Blyth Urban District Council. Mr. Robert Grieves, Surveyor.

Ridley Avenue.

	£	s.	d.
J. W. Henderson	£2,342	13	7
J. McLaren, Gosforth	2,340	5	2
G. E. Simpson	2,267	16	0
J. Robson	2,229	0	8
J. Coxon,* Seaton Delaval	1,998	18	2
McLaren and Proude	1,969	1	6

Plessey, Hedley, and Hunter Avenues.

	£	s.	d.
J. McLaren	£1,934	1	10
J. W. Henderson	1,914	13	3
G. E. Simpson	1,895	13	8
J. Robson*	1.826	15	1
McLaren and Proude	1,800	19	0
J. Coxon	1.581	0	1

Rest of Newcastle.

*Accepted.

Capcoch (Aberdare).—Accepted for new mixed school and altering present mixed and infants' schools, for Aberdare Urban District Council Education Committee. Mr. T. Roderick, Architect, Clifton Street, Aberdare:—

J. Morgan and Son, Ltd., Aberdare, £6,787 18s.

(*Tenders continued on page viii.*)

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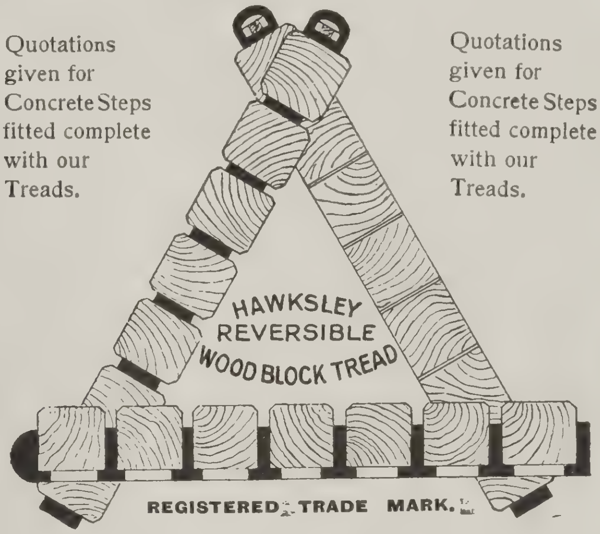

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(Tenders continued from page vi.)

Bury St. Edmunds.—For alterations to the Town Hall, for the Town Council. Mr. Sidney Naish, M.S.A., Architect, Bury St. Edmunds. Quantities by the Architect.

Wm. Bell and Sons, Cambridge	£1,664	0	0
G. F. Kenny, Ipswich ...	1,593	0	0
Spencer, Santo and Co., Ltd., Gt. Yarmouth	1,508	0	0
H. E. Ambrose, Cambridge ...	1,497	18	1
H. G. Frost, Bury St. Edmunds	1,470	4	3
F. R. Warren, Bury St. Edmunds	1,411	15	5
Hinnels and Son, Bury St. Edmunds	1,393	9	8
T. Parkington and Son, Ipswich	1,339	0	0
H. J. Linzell, Newmarket ...	1,328	6	10
G. Grimwood and Sons, Sudbury	1,314	0	0
Mason and Son, Haverhill ...	1,291	10	0
W. H. Hinkins and Sons, Ltd.* Royston, Herts	1,247	0	0

*Recommended for acceptance.

Bridgend (Wales).—Accepted for additions to County School, for Glamorgan Education Committee. Mr. D. Pugh-Jones, F.S.I., County Architect, Cardiff;—

W. Williams, Pearl Street, Cardiff, £1,999.

Chitterne (Wilts).—For erection of a house and stables, etc., a Chitterne, Wilts, for the Rev. T. Mason. Mr. W. Cecil Glass, Architect, 9, The Bridge, Frome.

F. Curtis and Son, Portway, Warminster, Wilts	£666	0	0
R. Butcher and Son, George Street, Warminster, Wilts ...	643	12	0
Polden and Feltham,* Chitterne, Codford, Wilts	617	8	0

*Recommended for acceptance.

Coventry.—For alterations and additions to the Stanton Club, Stoney Road, Coventry, for Messrs. Phillips and Marriott, Ltd. Mr. Herbert W. Chattaway, Architect, Trinity Churchyard, Coventry.

G. Anelay	£855	0	0
Matts and Cousins	845	0	0
Mottram and Son	822	11	7
Isaacs and Son	780	5	0
Kelley and Son	744	15	9
A. Wincott	765	0	0
Moss and Son	765	10	0
H. Goode	745	0	0
T. Hickman	735	0	0
A. J. Lord	699	0	0
Jones and Bacon*	687	17	0

*Accepted.

Devizes (Wilts).—For proposed house of detention at the Central Police Station, Devizes. Mr. J. G. Powell, County Surveyor.

W. E. Chivers and Sons, Devizes	£853	19	0
F. Burton, Durrington ...	850	0	0
H. Blackford and Son, Calne...	805	0	0
Parsons Bros., Westbury ...	768	0	0
J. Sidery, London, S.E.	750	0	0
E. Freece, Trowbridge	750	0	0
W. Webb, Bromham	625	0	0
T. Stone, Devizes	515	0	0
H. Ash, Devizes	498	0	0
G. Moore and Sons,* Trowbridge	472	0	0

*Accepted.

London.—For isolation accommodation in temperance ward at the Eastern Hospital, for the Metropolitan Asylums Board.

Isolation Rooms.

Pasterfield and English, 58, Sunnyhill Road, Streatham...	£2,498	0	0
Johnson and Co., 97-99, Southwark Bridge Road, S.E. ...	2,219	0	0
J. W. Jerram, Crown Works, Boundary Road, East Ham	2,150	0	0
B. E. Nightingale, Albert Embankment, S.E.	2,180	0	0
E. Brown and Son, Ltd., Wellingborough	2,167	10	0
A. Roberts and Co., Ltd., 74, Earl's Court Road, Kensington	2,100	0	0
W. Reason, 47, Rosebery Avenue, E.C.	2,099	0	0
W. Johnson and Co., Ltd., Wandsworth Common ...	2,098	0	0
Hammond and Miles, Scrafton Road Works, Ilford ...	2,045	18	7
J. Willmott and Sons, Hitchin and Hornsey	2,057	0	0
R. Marrable, 60, Pretoria Road, Leytonstone	1,987	14	7
W. J. Fryer and Co., Bravington Works, Paddington ...	1,975	0	0
F. Webster and Son, Grove Vale Works, East Dulwich ...	1,987	0	0
R. Wollaston and Co., 40, Turners Road, Limehouse ...	1,931	17	0
F. and G. Foster,* Camden Works, Norwood Junction ...	1,882	0	0

Architect's estimate (excluding re-painting), £1,885.

Re-painting.

W. Reason	£129	0	0
J. W. Jerram	120	0	0
Hammond and Miles ...	112	16	3
R. Marrable	104	0	9
W. J. Fryer and Co.	95	0	0
Joh..son and Co.	93	0	0
J. Willmott and Sons	91	17	6
B. E. Nightingale	85	0	0
E. Brown and Son, Ltd.	81	0	0
A. Roberts and Co., Ltd. ...	75	0	0
R. Woolaston and Co.	69	0	0
Pasterfield and English	64	0	0
F. Webster and Son	60	0	0
F. and G. Foster*	59	0	0

*Recommended for acceptance.

London, S.E.—For alterations and additions to Nos. 13, 13a, 15, and 17, Peckham Rye, S.E., for Messrs. W. Humphreys and Son. Mr. Leonard Dowton, Architect, City Bank Chambers, Bedford Row, W.C.

Courtney and Fairbairn, Ltd. ...	£655
J. Marsland and Sons	579
E. A. Roome	565
F. Dawes	560
H. H. Hollingsworth	534
W. T. Champion*	525
G. Parker and Sons	507

*Provisionally accepted.

Penybank (Wales).—Accepted for additions to existing school, for the Glamorgan Education Committee. Mr. D. Pugh-Jones, F.S.., Cardiff, County Architect:—

J. Lewis, Tirphil, £748.

Scartho (Lincs).—For the erection of an elementary school at Scartho, for the Lindsey County Council Education Committee. Messrs. Scorer and Gamble, Architects, Bank Street Chambers, Lincoln.

W. Hill, Tetney	£1,430	0	0
Wright and Son, Park Street, Lincoln	1,258	10	0
Mawer Bros., Kidgate, Louth	1,217	8	0
H. Marrows, Garden Street ...	1,212	0	0
H. and E. Smith, 65, Cromwell Road	1,179	0	0
J. G. Allison, Waltham ...	1,154	6	3
Holmes and Richardson, 2, South St. Mary's Gate ...	1,149	10	0
Hewins and Goodhand ...	1,145	0	0
Hollingsworth Bros., South Killingholme	1,125	[illegible]	[illegible]
W. Kirton, Tirs, Great Coates, near Grimsby	1,124	16	7
T. T. Salmon and Co.,* Cudworth, Barnsley	1,077	0	0

Rest of Grimsby.

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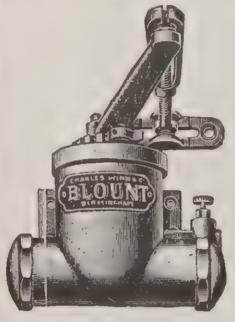

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R.I.B.A. Polity and Progress. Mr. Ernest George's presidential address to the R.I.B.A., received just in time to be printed in last week's issue, but too late for comment, was not elaborate in composition, but was extremely interesting in the details. It opened with the very gratifying if dubiously accurate announcement that in a few months the Institute will be "suitably housed." To increase one's accommodation is not necessarily to be "suitably housed." The R.I.B.A. ought surely to build for itself, and to do it in the Grand Manner. But, as the President remarked with regard to the growth of architecture, "changes come by degrees," and this step towards expansion will gratify, although it does not satisfy. Turning to general topics, Mr. George observed that in this country we have admirable builders, craftsmen and workmen equal to the best, and young architects who at least are receiving a better training than was common a generation ago. Moreover, their opportunities are being still further enlarged. The scheme for the founding of a British Architectural School of Rome is taking shape, Mr. John Simpson having drawn up a practical working basis for consideration; and probably, in building upon this basis, Sir Brumwell Thomas's proposal for a Diploma School, where architectural study would be carried further than in the ordinary course of training, and whose students would compete for the Prix de Rome—we trust that a sufficiently dignified English name may be found for it—will not be neglected. Town planning or civic design—the rival terms are supposed to be struggling for supremacy, but seem to us to express or suggest different ideas—naturally came into the address, but was not greatly illuminated, although the announcement is welcome that the Institute Committee for the study and elucidation of the subject is likely to organise a conference on it. There was a timely reference to bridges, with two very pertinent questions: (1) "Is there any reason why a Thames bridge built now should have less dignity and propriety than London Bridge and Waterloo Bridge?" We should say that the answer is in the negative: the art, the men, and the money being no doubt available. (2) "Is there not a shoddy and commercial appearance about most of the later attempts to span the river—a lack of monumental fitness?" We are afraid that the answer must be in the affirmative; and since, as Mr. George observed, "the bridges of a great city are the features that most impress the mind and remain on the memory," the city owes it to itself to see that none of its bridges are allowed to fall short of the high standard attained by the two bridges cited. Also the City Guildhall should surely express or reflect the City's greatness, and we would join with Mr. George in begging the Corporation to decide on a comprehensive plan on a grand scale, so that when foreign guests are entertained there they may not have reason to think meanly of our ideas of civic design. The exaggeration or distortion of art values from which, as a nation, we are still suffering acutely, was justly criticised. While, as Mr. George acknowledged, it is gratifying to see how large sums have been forthcoming when a picture has had to be secured for the nation, it is nevertheless obvious that "the cost of five Old Masters (in the present artificially inflated state of the market) would provide a noble building in which Drama or Music should be housed, receiving tributes from sculptor and painter," and that while canvas pictures are being secured at exaggerated cost, "the cheapening process is applied to public buildings and works that might have an exalting influence," being "the common property of all," because patent to all beholders. Very welcome are the two announcements with which the pithy address concludes—that a winter exhibition of architecture and the contributory arts is to be held at Burlington House, and that the basis of the Royal Institute is to be broadened under its new charter and revised by-laws, when "we are to ask Parliament for higher powers and a more secure position;" which elegant periphrase, being interpreted, seems to spell "Registration."

Tendering for the Supply of Bills of Quantities. The Council of the Metropolitan Borough of Deptford is inviting tenders from quantity surveyors for the preparation of the bills of quantities for a small library they are about to erect. From the fact that their advertisement has only recently appeared, it is probable that its issue was decided upon at the last meeting of the Council previous to the elections, and it is no doubt intended as a reminder to their constituents that their representatives effect a substantial saving of the ratepayers' money whenever possible. The election addresses of those candidates who were successful at the Borough Council elections three years ago are not before us. They, however, no doubt evinced their authors' determination to "save the rates" (a stock phrase without which none of these addresses are complete), and we fully recognise that promises made on these occasions must (if possible) be redeemed. At the same time we strongly deprecate the practice of inviting tenders from quantity surveyors, which is, in our opinion, a most undesirable method of engaging professional services. Any small saving in fees which may be effected by its adoption is more than counterbalanced by the loss to the public which is sustained through the issue of improperly prepared quantities. It is a curious fact that it is mainly those public authorities in whose membership the trades union element largely predominates which seek to lower the professional standard by reducing the fees for professional services to a point at which they are not remunerative to a properly qualified man. Deptford itself is a typical instance, the population of which is largely employed in one or other of the industrial undertakings carried on within its area, which has a well-known trades unionist representative in Parliament and on the County Council, and which has usually (we believe) a trades unionist majority on the local Council. These authorities to which we refer invariably insist on the insertion of a trades union clause in their building contracts, under which a contractor is compelled to pay the recognised rates and observe the union hours of labour, yet, with singular inconsistency, when it comes to a question of engaging a surveyor, they ignore the very moderate scale of charges issued by the Quantity Surveyors' Association and adopt, to quote John Ruskin in "Unto this Last," "the false, unnatural and destructive system under which the bad workman is allowed to offer his work at half-price and either take the place of the good or force him by his competition to work for an inadequate sum." Protests against the Deptford Borough Council's action will no doubt be made by those professional societies to which quantity surveyors belong. We must, however, confess that we are not very sanguine of the success of any "protests," and, in our opinion, the only relief from a position which threatens to become intolerable is to be obtained by the formation of a very strong and representative trades union for quantity surveyors, or, in other words, by the enrolment of all those whose work mainly consists in taking out quantities in the ranks of the Quantity Surveyors' Association.

German-made Scottish Schools.

Leith School Board is gaining a very unenviable notoriety. Wanting two new schools, it must needs go to Germany for them. The schools, so far as our information goes, are to be temporary, and that, we understand, is the ostensible reason for adopting a German system in which the walls are removable. Now, quite apart from any merits that the system may possess—and its applicability to the circumstances has been hotly challenged—surely this is no time for bestowing upon foreigners the work and money of which British builders are so sorely in need. The depression of trade in Edinburgh is, if possible, even worse than it is in other parts of the country. As one of the speakers at a protest meeting remarked, the Board, at the very moment when it finds itself obliged to consider the question of feeding hungry school-children, is simultaneously "depriving the parents of the means of keeping body and soul together," since about forty per cent. of the £13,000 or £14,000 which these schools are to cost will go to Germany. We do not wonder that a strong protest has been entered against this amazingly inopportune transaction, but we are certainly surprised that the protesters were able to restrain their natural anger within the bounds of moderation. Their not undignified remonstrance may perhaps have the desired effect of preventing this ill-advised and most unfortunate experiment, and for this reason we are for the moment disposed to follow their example. But, nevertheless, we also lodge our most emphatic protest against the inexplicable and apparently inexcusable folly of employing foreigners to do work that we are quite confident could be done at least as well by builders on the spot; for, apparently, the Board have not even the poor excuse—so commonly put forward by authorities perpetrating similar sins against patriotism and propriety—that they are thereby saving the ratepayer's pocket. We trust that the Board will yet be able to avert the odium that it must certainly incur if it perseveres in this extraordinarily ill-timed and capricious adventure. At any time, and in any circumstances, it would be difficult to justify; at the present moment it is equally impossible to understand or to condone it, and we trust that the Edinburgh builders will fight against it *à outrance*, and, if necessary, invoke the powerful aid of the National Federation.

The L.C.C. and the Mistress Art.

The London County Council has, we fear, taken a false step with regard to architecture. At last week's meeting, the General Purposes Committee recommended that as from January 1st, 1910, the educational architectural work be placed under the charge of the architect, and that the staff of the Department of the Architect (Education) be transferred on that date to the Department of the Architect. Mr. W. H. Key moved as an amendment that the recommendation be referred back to the General Purposes Committee with instructions after conference with the Education Committee to report as to the appointment of one chief officer to have control of the whole of the educational architectural work of the Council. Mr. Key read a manifesto signed by several London architects. The document stated that it was most undesirable that structural and statutory architectural work of the Council should be carried out by one official, and that the evil would be greatly aggravated if the structural work of the Education Committee was thrown upon the department. That view, they believed, was also held by the majority of architects who had the future of London buildings at heart. The qualities which were required for the statutory work were not those which should be essential for the official having the design of the Council's various buildings under his charge, and they believed that the dividing of the work of the Council's architect was the proper solution of the difficulty. The manifesto further stated that were not the meeting at which the protest was to be made so imminent its promoters believed that it would have been possible to have laid before the Council a formidable petition from architects bearing out this view. The amendment, after a protracted discussion, was defeated by 62 votes to 33, and the committee's recommendation was then agreed to. Precisely what the London architects meant by "the dividing of the work" is not quite clear. If it simply means that they wished to keep things as they were, and were advocating simple division, we could not yield their contention unconditional support. We are for compound division! That is to say, we have always held, and still hold strongly, that the work of designing buildings required by the Council should be thrown open to general competition. The simple division theory would still hold good. Education, in London, is a big enough subject to demand the services of an architectural expert in that kind, who would find plenty to do in an advisory capacity, but he should not be called upon to design schools. If stereotyped monotony of style and elevation is to be avoided, and if the artistic side of architecture is to receive due attention, the Council must make use of all the talent available. This seems to us to be so obvious a truism that to labour the point would be superfluous to the verge of boredom. As, however, the Council does not seem to be fully alive to its responsibilities with regard to the Mistress Art, we can only hope that this unstatutory obligation will be urged upon them cogently, influentially, and without delay. The R.I.B.A. seems to have missed an excellent opportunity of pressing for a much-needed reform.

A New "Exemplar."

The most effectual method of studying architecture being that of measuring and drawing good work, it is plain that the next best way is to study the drawings thus produced. The value of such drawings is indisputable. The objects that are worth measuring and drawing, although plentiful enough if one knows where to look for them, are not always or generally accessible; and even when these difficulties are overcome, the barriers of time and distance may be insuperable. The student—and every properly constituted architect is a student to his latest day—is therefore glad to have at his disposal the measured drawings of work that is in any way exemplary. He misses, of course, the supreme advantage of seeing it in three dimensions; but, after all, that is no very great drawback, considering that the trained eye of the architect enables him to visualise, from the drawings, the actual and substantial effects. The mere copying of such drawings is no doubt a valuable exercise, more impressive, because ensuring greater concentration, than even the closest inspection in which the pencil is not employed. But, besides their educative value as a means of training the eye and the hand, stimulating the imagination, and increasing the store of mental possessions, they offer patterns and models for adaptation to further uses. This note is suggested by the announcement that the Second Series of "The Exemplar in Architecture" is now on sale, and is to be had at the offices of this journal, price 12s. 6d. nett. This work consists of 112 plates of measured drawings and photographic views of architectural work that is worth studying. Prominent among the details are those of balustrades, ceilings, cornices, doors, gates, piers, and panelling; and the measured drawings are accompanied by fine photographic views. The name of the editor—Mr. Mervyn E. Macartney, F.R.I.B.A., F.S.A., is a sufficient guarantee of the taste and judgment with which the objects have been chosen for illustration. The plates, which are finely printed on stout "art" paper, are not bound together in volume form, but are collected in a neat portfolio, so that each can be detached for convenience of reference or study. With the plate as unit, and the portfolio as section comprising such details as can be appropriately classed together, the "Exemplar" will in process of time form a comprehensive library of architectural examples; each section, however, being quite complete in itself, and unrestricted by any over-rigid system of classification. The Second Series, for instance, is not scrupulously confined to the more or less closely related details which preponderate in it, but shows incidentally some beautiful elevations and interiors. Still, the general plan of the work affords architects an unexampled opportunity of building up, as on the sectional library system, a complete cyclopædia of architectural examples. They should make haste to get the Second Series of the "Exemplar," for it is sure to run out of print very soon.

Coming Events.

Wednesday, November 10.

ROYAL SANITARY INSTITUTE, 90, Buckingham Palace Road, S.W.—Discussion on "The Quality of Effluents in Relation to Standards," opened by Mr. Gilbert J. Fowler, D.Sc.

Monday, November 15.

ROYAL INSTITUTE OF BRITISH ARCHITECTS, 9, Conduit Street, Hanover Square, W.—Mr. H. Inigo Triggs, A.R.I.B.A., on "The Planning and Laying Out of Public Places," 8 p.m.

Tuesday, November 16.

JUNIOR INSTITUTION OF ENGINEERS, at the Royal United Service Institution, Whitehall. —Presidential Address, on "Recent Warship Machinery," 8 p.m., by Engineer Vice-Admiral Henry J. Oram, C.B.

Wednesday, November 17.

NORTHERN ARCHITECTURAL ASSOCIATION, Newcastle.—Students' Meeting. Mr. J. G. Smith on "Portland Cement Manufacture and Testing," 7.30.

Thursday, November 18.

ILLUMINATING ENGINEERING SOCIETY.—Opening meeting, at the premises of the Royal Society of Arts, 18, John Street, Adelphi, London, W. Inaugural Address, by Prof. Silvanus P. Thompson, D.Sc., F.R.S.

Friday, November 19.

ARCHITECTURAL ASSOCIATION, 18, Tufton Street, Westminster.—Mr. C. Reginald Enock, F.R.G.S., on "Architecture of the Incas of Peru," 7.30 p.m.

Friday, November 19.

INSTITUTION OF MECHANICAL ENGINEERS, Storey's Gate, Westminster. — Ordinary General Meeting. Mr. Herbert A. Humphrey on "An Internal Combustion Pump, and other Applications of a New Principle," 8 p.m.

R.I.B.A.

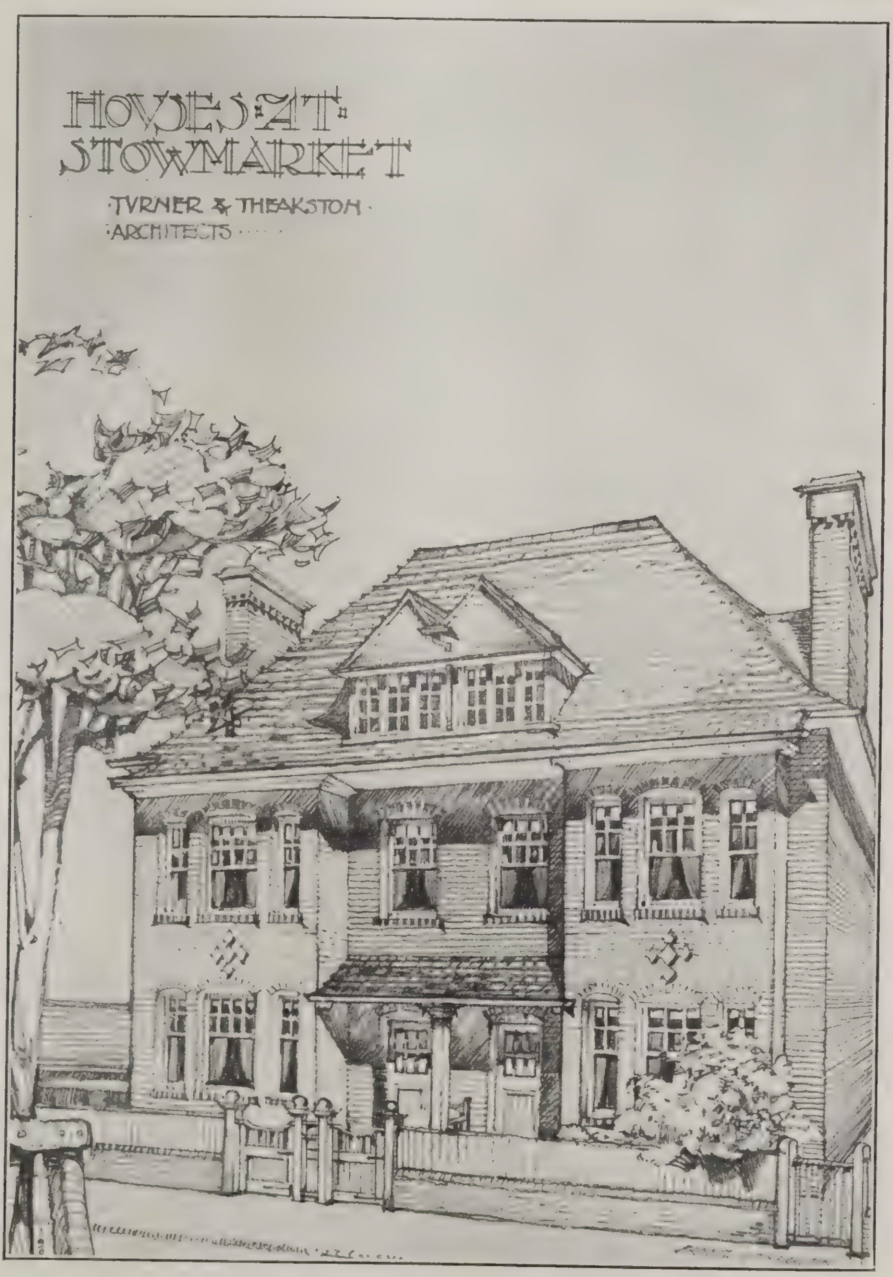
Obituary.

At the meeting of the R.I.B.A., held on Monday, November 1st inst., the honorary secretary regretfully recorded the decease of the following members:—Nathan Solomon Joseph, Associate 1863, Fellow 1890; Frederick Hyde Pownall, Associate 1857, Fellow 1860; Henry Stock, Fellow 1885. Don Jose Urioste y Velada, Hon. Corresponding Member, Madrid, elected 1905; Frederick Henry Williams, Associate 1878; John Wornham Penfold, Associate 1860, Fellow 1881; John Archibald Campbell, Fellow 1906; William Owen, Associate 1879; Auguste Choisy, Hon. Corresponding Member, Royal Gold Medallist 1904; C. Follen McKim, Hon. Corresponding Member, Royal Gold Medallist 1903.

The Royal Gold Medallist and His Work.

The President, Mr. Ernest George, having delivered the address, published in our last issue, then formally presented Dr. Arthur Evans with the Royal Gold Medal.

Dr. Evans, in acknowledging the honour that had been conferred upon him, observed that anything he had done towards lifting the veil from that early civilization could never have been achieved had it not been for the powerful and devoted help of his coworkers. He knew that from some points of view the work with which his activities had been associated could not be compared with the grandiose architecture of Greece. It represented a more primitive age. It showed, however, what an extraordinary advance had been made before the era of classic Greece. Not merely in the details, but in the whole planning, was manifested a remarkable facility of expression; and he was surprised at the extraordinary perfection of the sanitary arrangements. Having acknowledged his gratitude to the British School, and to Dr George Macmillan, without whose collaboration the achievement of the results would have been impossible, Dr. Evans gave a summary account of a communication to the Institute on the Palace of Knossos as a sanctuary, and the miniature frescoes. He drew attention to the evidence that had accumulated throughout the whole course of examination of the religious aspects of the great building. It was a sanctuary as much as a palace, and Minoan kings were also priests. It was unlike other palaces, either of the ancient or the modern world, in which the demands of cult might be satisfied by a single shrine or temple. In some respects it might be compared to the Vatican, for it swarmed with shrines, and had a hall for ritual functions. The evidence of a whole series of finds had now shown that the chief divinity of Minoan Crete was a virgin goddess—akin to Rhea and the Asiatic Artemis. The kings of Knossos seemed to have administered their realm as her high priests Besides the pillars of her shrines and the aniconic image of the goddess, was the sacred double axe; and the wonderful painted sarcophagus discovered by the Italian Mission at Hagia Triada, near the southern coast of Crete, showed actual scenes of worship in which offerings were being made to a pair of these axes, rising from stepped pedestals. The double axe, as was well known, recurred at a later date among the kindred Carian population, as the attribute of their Zeus called, from its native name, Labrys, "Labrandeus," and the view, put forth on philological grounds, that the Cretan Labyrinth derived its name from a dialectic form of the same name, was fully confirmed by the archæological evidence. The Palace of Knossos was, before all things, the "House of the Double Axe," and was thus the true Labyrinth of tradition. Exception had been taken to his view that the double axe, so constantly recurring on the Palace block, was anything but a mere mason's mark, or had any religious signification. Certainly there were many masons' marks on the Palace block besides the double axe. But, in several cases, it could be shown by their distribution that these had a distinct application to the character of the individual parts of the building. Several of these marks, in fact, belonged to the current hieroglyphic system and possessed a recognised ideographic value. The double axe, for instance, could be shown to recur in what appeared to be official titles, and coupled with the Palace sign. It was far more numerously applied to the palace walls than any other sign, and marked the principal lines of wall and entrances, the grand staircase, and the most important reception hall. Its repeated recurrence on the stone pillars rising in the centre of two small basement rooms might, then, be taken to show that they possessed a special sanctity. This view had been doubted when he first put it forth, but the discovery of many other similar pillar rooms exhibiting evidence of religious usage had now put the matter beyond doubt. These pillar rooms were the "crypts" of Minoan sanctuaries. In the south-east house at Knossos, the base of a sacred double axe was actually standing against such a pillar, which itself again was marked by the sacred symbol. Ritual vessels and basins of the same kind were found both in the Palace and elsewhere, either within or in close association with such chambers. The whole west wing of the Palace presented indications of its various halls and chambers having served religious purposes. Besides the central shrine of the goddess, here represented in her nether-world aspect as holding serpents, it was now clear that the chambers contiguous to the room of the Throne contained at least three small shrines, one of which had at first been wrongly supposed to be a kitchen. The Throne Room itself, and neighbouring benches, seemed rather to have belonged to a small consistory of the Priest Kings than to have been intended for any secular usage. At the north-west angle of the Palace near this, had existed another pillar shrine and an upper hall of a ceremonial nature, the wall paintings taken from which exhibited a columnar structure, with pairs of double axes stuck into the capitals, and sacred horns above the stylobate. Other fragments of fresco from the same place showed votaries bearing gold and silver vessels, and others again relegated to the sports of the bull ring, which themselves seemed to have had a religious connection. But the miniature frescoes derived from some sanctuary structure on an upper floor near the northern "piazza," gave the fullest impression of the religious functions of the Palace. Dr. Evans then described the methods by which two complete designs, each forming a separate panel, had been reconstructed from the fragmentary remains. One of these depicted crowds of spectators of



PAIR OF HOUSES, STOWMARKET.

These houses have been erected in Milton Road, Stowmarket, from the designs of Messrs. Philip J. Turner and Ernest G. Theakston, of Stowmarket and London. The walls are faced with local red bricks, and the roofs and dormers covered with red tiles. Mr. Ernest Death, of Stowmarket, is the builder.

both sexes looking on at a dance of gaily-dressed females in a court below, and a discovery made by him this season had supplied a welcome illustration of the character of the performance. From a tomb just excavated near the Royal Tomb, already explored, and on the same interesting structure, he had obtained a gold signet ring with a finely engraved design, the lower part of which exhibited dancing female figures similar in attitude and arrangement to those of the fresco. But in this case, together with sacred emblems, a figure of the great Minoan goddess appeared above in a reserved celestial space. The dance, then, was of a religious and orgiastic character, and in honour of a goddess, who, in a later Hellenic garb, appears as Aphroditê Ariadnê. The court, with dancing votaries depicted on the fresco, which was obviously some part of the actual Palace system, might be taken to represent the actual dancing place of Ariadnê, which Dædalos, according to the Homeric tradition, was said to have fashioned "in broad Knossos." The other panel showed the same crowds of spectators thronging the courts and terraces of a building, the central feature of which was a small, brilliantly coloured pillar shrine with a taller central compartment and two lower wings. It is probable that this might actually represent a shrine existing in the northern quarter of the Palace. Some curious evidence, to which attention was called, seemed to indicate that in the latest period of the remodelled Palace of the west wing, facing the central court, near the place where the repositories of the earlier shrine of the Snake Goddess had been discovered, on the face of a low stylobate bordering the court in this quarter, traces had appeared—made clearer by successive seasons' rains—of two pairs of column bases with an intervening blank space between them, where, according to the typical plan of the Minoan pillar shrines on the fresco, the central cell would have risen. It was noteworthy, moreover, that in the inner space within one of these wings had been found a series of clay seal impressions, showing the great Minoan Goddess on a height between two guardian lions, with a small pillar shrine on one side. These sealings themselves naturally indicated the neighbourhood of a sanctuary; and what made the evidence still more suggestive was the appearance, inside the central space between the pairs of column bases, of a curious recess, in the bottom of which remains of a chest containing documents had been found. Putting two and two together, he had arrived at the conclusion that they had here the more or less complete ground plan of a small Minoan pillar shrine, the plan and elevation of which were then shown on the screen.

Dr. George Macmillan, who proposed a vote of thanks, said that he was pleased to observe in the President's address a reference to the proposed architectural school at Rome. That time last year allusion was made to the matter, which caused something of a flutter in the minds of persons connected with the existing school at Rome. Some thought that the British School was already there. Matters had now been cleared up, however, and he had reason to believe that when the scheme was carried out all friction would be avoided. Those who had not heard Dr. Evans speak could not know what the world of learning owed to his genius. The Crete discoveries revealed not only the scholar, the student, and the explorer, but the man of brilliant imagination.

Mr. George Hubbard, F.S.A., seconded the vote of thanks and gave a eulogistic and interesting description of Dr. Evans's career. In conclusion he observed that Dr. Evans enjoyed the unique distinction of being the fifth generation to put F.R.S. after his name.

The British Uralite Company, Ltd., of 16, St. Helen's Place, London, E.C., have been awarded a diploma and gold medal for their exhibit at the Imperial International Exhibition at the Great White City. The exhibit was a pavilion constructed of the company's well-known fireproof materials—uralite and asbestone.

HOUSE DRAINAGE AND SEWAGE DISPOSAL.*

By W. D. Scott-Moncrieff.

The subject of drainage and sewage disposal is so full of necessary detail that a single lecture is an altogether inadequate medium of instruction, and in domestic sanitation more especially there is nothing that can supply the place of actual practice and experience.

Domestic Sanitation.

The system of disconnecting the house-drain from the sewer has been so generally accepted, and has been so long in almost universal use, that it may be looked upon as a fundamental principle of good domestic sanitation.

Within the last few years this position has not only been attacked, but has been made the subject of argument from quarters that are too influential to be lightly disregarded. At the present moment the question is under the consideration of a Departmental Committee of the Local Government Board, and I am not aware of the architectural profession having taken any strong position as to their claim, their just claim, to take a leading part in the controversy. I am afraid that architects hardly realise the extreme importance of the issues that have been raised.

The First Disconnecting Device.

Many years ago, but within the recollection of many of us, the only protection that existed against the dangerous intrusion of sewer-gas to the interior of our dwellings consisted of an unventilated soil-pipe provided with a D trap, connected to a pan-closet. The idea of making at some point a complete disconnection between the house-drain and the public sewer occurred to me, and no doubt many others, as an obvious precaution, but the honour of having put the proposal into actual practice and giving publicity to the system rests, I believe, with the late Dr. Fergus, of Glasgow, who made a manhole in his back garden on the line of his house-drain, where he fixed an old-fashioned form of trap with a disconnecting channel. This arrangement I saw myself more than thirty years ago, and I was keenly alive to its obvious advantages. Soon afterwards the arrangement first used by Dr. Fergus was improved upon by Mr. Buchan, who introduced an improved form of trap, which bore his name, and became widely adopted in connection with an access chamber. This system of disconnection has remained, with a few changes in details, the standard arrangement ever since, and its adoption has spread all over the civilised world unchallenged until quite recently, when advocates have risen who almost demand that it should no longer be used, and that the disconnecting house-trap should be definitely abandoned.

The first sign of revolt again this widely accepted device of a disconnecting trap, so far as my information goes, came from the surveyor of one of the outlying London District Councils, who undertook the somewhat laborious task of making a systematic note of the actual working of several hundred disconnecting-traps in his own district and tabulating the results. It appears from this examination that the habits of the householders in that neighbourhood were, to say the least, somewhat peculiar, and seem to have been principally characterised by their indifference to the disappearance of their scrubbing-brushes, which the inspectors discovered in their disconnecting-traps. I think the obvious objection to making this information a ground for doing away with disconnecting-traps altogether is that it would not apply to other districts where the inhabitants are less indifferent to the disappearance of their domestic appliances, and where a similar investigation would give totally different results.

The other argument used was of a very different kind, and consisted of a suggestion or claim or demand that the local authorities should be free to make use of the ventilated soil pipes of the householders as a means for solving the problem of sewer ventilation which surveyors have been unable to achieve in any other way.

To this proposal I think there are many serious objections, and the interests, as well as the principles, that are at stake are of such importance that I hope my referring to them very shortly will not be considered out of place. The argument that a certain amount of carelessness is unavoidable in the cheaper kind of houses occupied by people who are altogether indifferent to what goes on with their drainage, as I have said, disappears with the facts supporting it, and can carry no weight where the carelessness referred to does not exist. The other argument, that the traps interfere with the use of soil pipes for the ventilation of the public sewers so as to avoid the use of street gratings, is in a quite different category. It is true that having sewer gratings on the level of the streets is not a sanitary arrangement; but, because sewer ventilation still offers many difficulties, it would surely be a mistake to interfere with the perfection that has been attained in our domestic sanitation by mixing it up with defects in the public sewers, with regard to which great efforts are now being made to find a remedy. In certain states of the atmosphere, and especially when the weather is calm, it would be a most risky system that provided for foul sewers being ventilated through the house-drains and soil pipes where the gases would be absorbed by the water in the traps, and discharged as foul odours in the interior of the houses themselves. Against this most serious occurrence there could not be a remedy of any kind, because the disconnection of which the trap is a necessary adjunct would be prohibited by the by-laws which it is proposed to alter in order to give effect to the new proposals.

Self-cleaning Sewers.

Referring to the sewers, Sir Robert Rawlinson, who was a past-master in their construction, laid down the apparently reasonable proposition that if they were laid with an adequate fall and were efficiently flushed, they would be self-cleansing, and that being so, their ventilation would be a simple operation if there were no foul gases to be dealt with. This seemed to be a simple solution of the problem by the expedient of avoiding the existence of the difficulty.

I do not know if there are any sewers that comply with the conditions he suggested, and in which no nuisance has ever occurred, but it has transpired in ordinary practice that even sewers with ample falls and efficient flushing still give rise to emanations from the street gratings. It should be observed that in practice the flow varies greatly at different hours of the day and night, and that this must involve the existence of large surfaces that are so fouled as to give rise to the odours complained of. It has also been found that the movement of the air in sewers is of the most erratic kind, due to wind and other causes, and that arrangements that work admirably under certain conditions altogether fail owing to sudden changes which it is impossible to control.

It is difficult to arrive at reliable information as to the immediate effect of the existing arrangements upon the public health, because other conditions overlap so as to make it difficult to fix upon the one which is really accountable for the different death rates. There is certainly no immunity on account of a rapid fall in a particular line of sewers, because the gases may find their way most freely to the highest level, and the escape from the street gratings may be as bad, or even worse, at the top than at the bottom of the incline.

As matters stand at present it really amounts to this, that a sewer open from end to end, or, in other words, a well-constructed ditch, is just as much or as little likely to be a danger to health as a sewer with its foul gases escaping in a more concentrated form at any particular point. In this connection it may be well to refer to the experience of Bristol, where no system of ventilation has yet been found which could be adopted in any one district of the city without being detrimental to others, and, this being so, they have not provided sewer ventilation of any kind. All the same, the houses have been provided with disconnecting-traps, and there is no evidence to be found in the death rates arising from diseases in any way attributable to sewer gas that can be regarded as unfavourable to the existing arrangements when compared with the death rate of other towns where the sewers are ventilated throughout. In any case, it seems a poor remedy for any evils that may exist to ventilate the gases from the sewers on or about the level of the windows where the great majority of the occupants are in the habit of sleeping. My apology for having said so much upon this aspect of domestic sanitation must be that it is a matter seriously affecting the interests of architects' clients, and that the revolutionary proposals I have referred to ought to have their very serious consideration.

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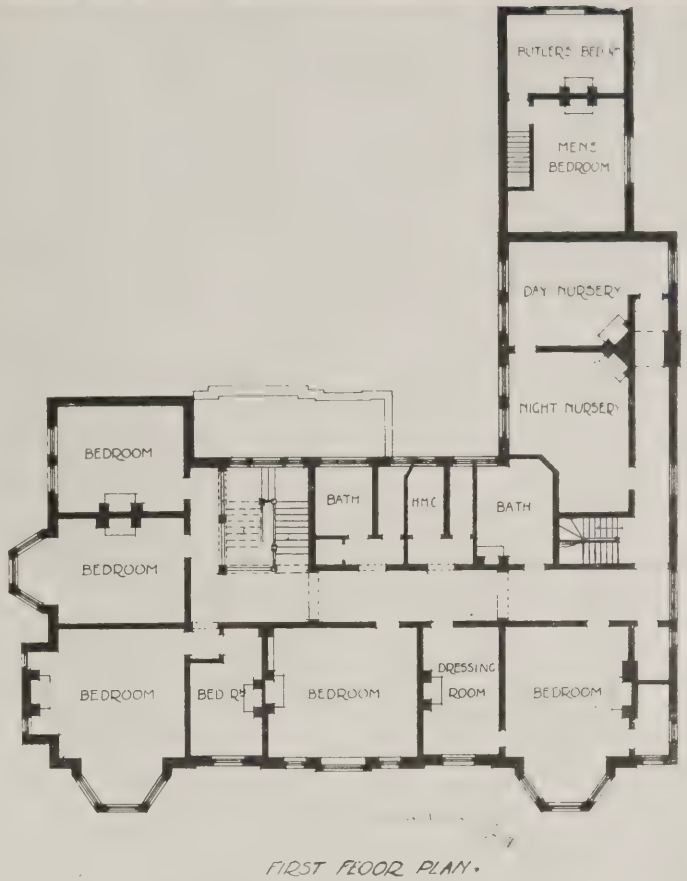
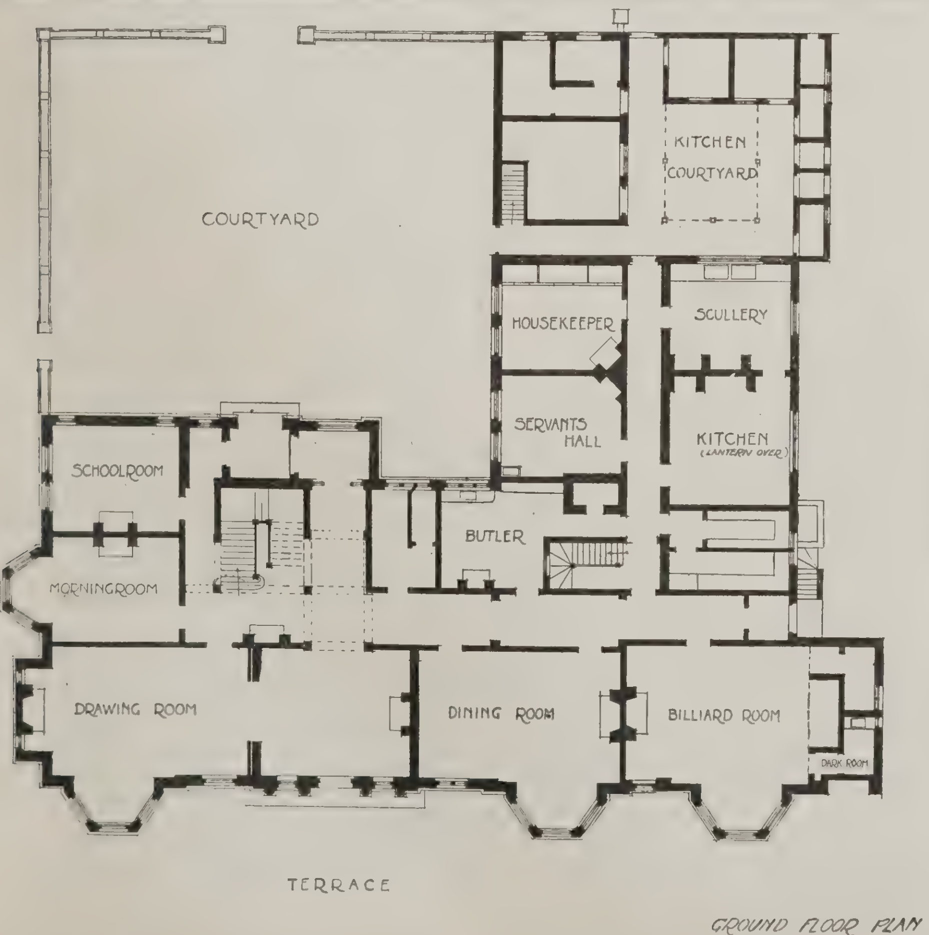
*Abstract of a paper read before the Architectural Association on November 5th, 1909, by Mr. W. D. Scott-Moncrieff.



THE RED HOUSE, CROMER. G. J. AND F. W. SKIPPER, ARCHITECTS.
(See centre plate.)

The Water Test.

A question often arises as to the amount of defect in an existing drain which justifies a recommendation for its complete renewal. The method that has been adopted for many years and which has superseded all other devices is the water test. In the case of stoneware pipes this is a severe test, and it is doubtful whether it can always be regarded as a fair one. With so many joints made in a way that is never dreamt of as a practical means of bearing water pressure in other cases, such as the conveyance of a water supply, it seems strange that it should be justified in a conduit that is condemned if it is not water-tight when it happens to be used as a drain. Recent opinion as to the relation between bad smells and disease has not confirmed the extreme views that prevailed a few years ago, and in any case no one suggests that a slight leakage of sewage several feet below the level of the ground even inside a house can be a serious danger to the health of the inmates. If this were so, it is obvious that, *pro rata*, a well-manured garden would be almost certain death. Whether this view is a right one or not, if an architect does not condemn a drain for the smallest leakage that is perceptible under a water test, it is fairly certain that some other expert, if he is called in, will find it incumbent on him to do so, and in that event the architect who ventured upon taking a common-sense estimate of the danger will be looked upon by his quondam client as a man who did not understand his own business. As a matter of fact, this has often occurred in practice, and new drains one after another have been frequently condemned in the same house on a change of tenancy or ownership for some trifling failure in an arrangement which in practice is never subjected to a water pressure greater than that of the passing sewage, which is practically no pressure at all. It was from the consideration of these difficulties that I made up my mind long ago to look at the question, not from the relative merits of stoneware or cast-iron, *per se*, as the best material for the construction of house-drain as if the water test had not come into vogue, but from the point of view as to which was best able to stand the test when applied. This was more than twenty-five years ago. The first large building which was redrained throughout with cast-iron pipes in London was the Foundling Hospital, where I was allowed a free hand, but it was several years before the architectural profession began to see the necessity of considering the subject mainly from the point of view of the water test. It is obvious that, in the case of cast-iron pipes and connections, the whole system should be capable of standing a high pressure of water without the slightest leakage, and that if any occurs the architect is quite justified in condemning them.



THE RED HOUSE, CROMER. G. J. AND F. W. SKIPPER, ARCHITECTS. *(See centre plate.)*

Early Domestic Sanitation.

In looking back upon the early days of domestic sanitation, I remember the enthusiasm with which many architects took up the crusade against the prevailing defects: the old pan-closets, the foul D traps, the unventilated soil pipes, the dipstones, and the bell-traps, all of which have now become ancient history, with which the young architect seldom has to deal with nowadays. Among these reformers was my old friend Mr. Philip Webb, but the architect who was most distinguished for his direct and original contributions to the solution of the many unsettled practical problems of that time was the Nestor of your profession, Mr. Norman Shaw. What he made use of in his own practice was an arrangement that not only provided for a double disconnection of the soil pipe from the house-drain, but did away with the use of a trap underneath the closets and sinks as well. This he accomplished by means of a hopper head into which the soil and sink pipes discharged at their upper extremities, with a corresponding disconnection on the ground level arranged with a gully-trap. In this manner he avoided the use of any closet or sink traps inside the house, to which I believe he had a strong objection, and he at the same time advocated the adoption of soil pipes of a small diameter to avoid any accumulations upon their internal surfaces. It happens that a case came to my notice only last year in which these arrangements were condemned by a local authority as being inconsistent with their by-laws, and, in consequence, they were entirely removed, and ventilated soil-pipes with traps ordered to be put in their place. I mention this because it was found that the system had worked exceedingly well for, I suppose, about twenty years; and it was discovered on the removal of the soil pipes, which were only 3ins. in diameter, that their internal surfaces were as clean as the day upon which they had been fixed. It is probable that if this system had been in universal use the proposal to do away with the disconnecting-trap between the house-drain and the sewer would never have been made.

The Bacterial System.

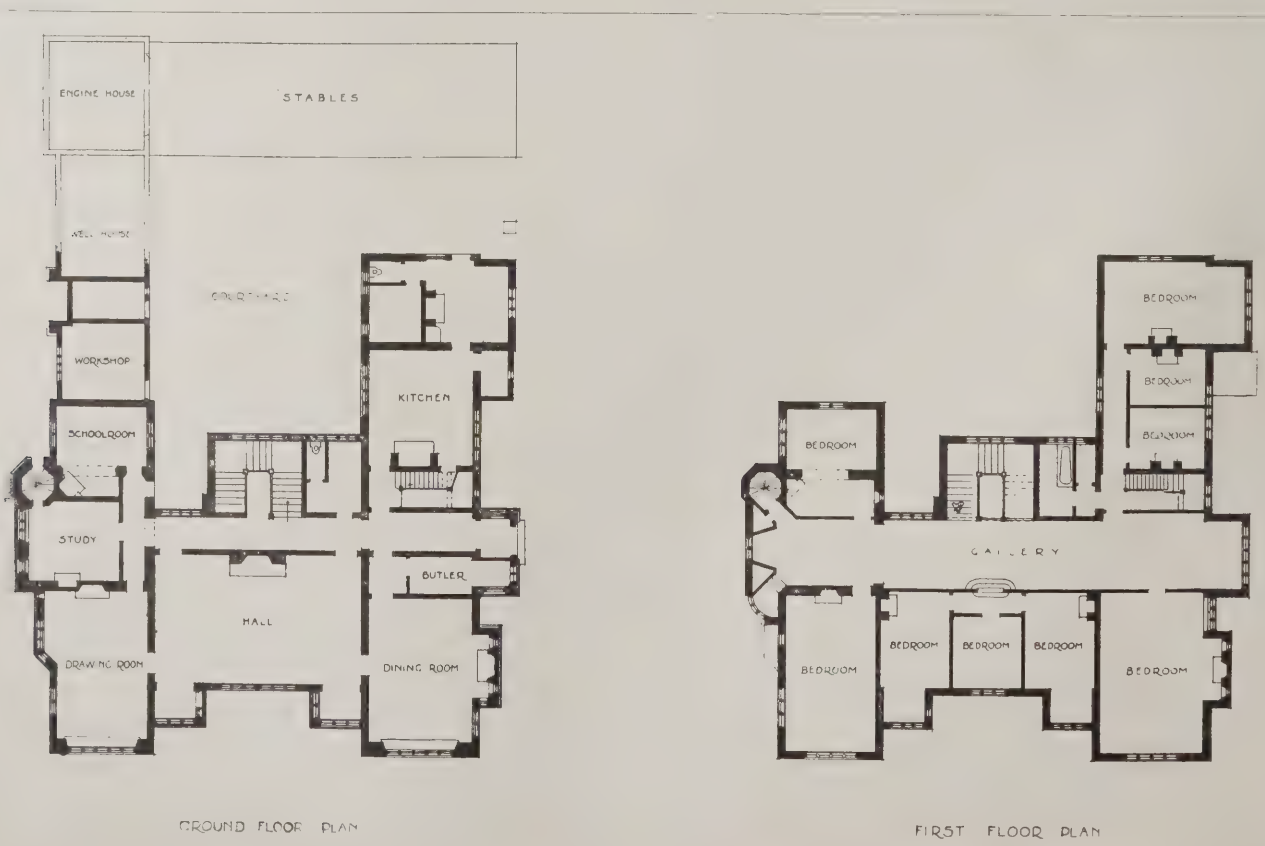
Coming now to the subject of sewage disposal, although my remarks should be confined to that part of it which most concerns the architect, namely, the drainage of country houses, it may be well to say something about the general principles which should apply when adopting what is known as the bacterial system of sewage disposal. It is needless to say that as a matter of fact the final purification of all foul matters has been due to the work of micro-organisms from the beginning of life on our planet, and that their work has been to restore organic wastes to their inorganic elements so as again to allow of their being used for building up the life processes of plants and animals through successive generations.

There are two terms, aerobic and anaerobic, which are in constant use, for which we are indebted to the illuminating genius of Pasteur. They represent the dividing-line between two kinds of micro-organisms, viz., those that can and those that cannot live without air; but it is a line that is frequently crossed. Without going into details, it is sufficient to observe that whether or not a particular organism can or cannot work in only one or in both of these conditions the difference between the results achieved by the two classes of bacteria is of the most remarkable kind.

The anaerobic changes come under the general term of putrefaction, and the aerobic of oxidation, but they each break down organic substances into simpler molecular forms. About the great difference that exists between the two processes there cannot be any doubt, seeing that one produces gases that can be used as illuminants, and the other, the aerobic group, those that will put out the light of a candle. The work of the two kinds of organisms, from a practical standpoint, must be judged from the effect they have in carrying on the required changes to the necessary standard of purification in any particular case, and the whole object of the process is to take the greatest possible advantage of their natural functions. Unfortunately the subject has hitherto been approached from an altogether unscientific standpoint, seeing that it has never been subjected to any method of measurement. The result has been, what must always be expected from rule of thumb, that no real progress in a scientific sense has been achieved at all, and though a Royal Commission has been sitting for more than ten years and spending large sums of money upon the collection of a vast accumulation of facts and figures, these can be of little value until they can be correlated in terms of a common standard of comparison, in comprehensible terms. In such a case an architect who is only concerned with practical results, but who is anxious to obtain some reasonable and definite knowledge such as he can obtain in other branches of his profession from text-books that deal with accurate and scientific data, may well be forgiven if he is quite fogged when a client appeals to him for advice on the subject of sewage treatment by bacterial processes, and I am afraid that if he applied to the Royal Commission on Sewage Disposal for specific advice they could only refer him to reports and minutes of evidence and appendices that would make confusion worse confounded and be altogether beyond his comprehension.

One point is fairly obvious, that an architect has to deal with the problem in one of its simplest forms because, while there are many disturbing factors in the case of town sewage by reason of trade wastes and other complications, he has to deal with it in a fairly normal and uniform condition. It follows that if any real progress had been made in the direction of a standard method of disposal the architect should have been the first to be able to take advantage of it.

Turning your attention for a few minutes to what actually does occur when micro-organisms convert organic matters into their inorganic elements, it may be well to refer you to the highest results that have ever been obtained in the purification of purely domestic sewage by bacterial processes. It happens that the information is given in a much more detailed form than in any other experiments, because the changes are shown as they actually occur during the process of filtration. They are known as the Ashtead experiments, and are clearly set forth in the table. Without going into technical details it will be sufficient to point out that the great object is to convert the polluting nitrogenous substances into the mineralised form of nitrogen as nitric acid, in which they were originally assimilated by the life processes of the plant or animal. This is done by the conversion of the ammonia, and as the one of these is decreased there is a corresponding increase in the other. This may be regarded as the whole *rationale* of the process. The results were obtained by first subjecting the sewage to the action of the anaerobic or putrefactive fermentation carried on by organisms that do not require air, but assimilate the chemically combined oxygen in the organic matter itself. It was long a question as to how long this putrefaction should be allowed to continue, but as the result of experiments which I carried out for a Committee of the Surrey County Council quite recently it was shown that with a well-arranged filter a wide range in the period of the putrefactive fermentation



GROUND FLOOR PLAN

FIRST FLOOR PLAN

MANCROFT TOWERS, OULTON, SUFFOLK. G. J. AND F. W. SKIPPER, ARCHITECTS. (*See centre plate.*)

was permissible without seriously affecting the results.

A Recent Example.

The most recent installation that has been carried out on these lines has been for Messrs. Forsyth and Maule at a large country house in Berkshire. Here the sewage is first delivered into a chamber in which a deep dip-stone is fixed. The effect of this is to force the incoming sewage in a downward direction so as to allow the heavy inorganic matters to fall to the bottom, provision being made for its removal as occasion demands. The sewage overflows from the forward end of this chamber into the same kind of apparatus which I used in my Ashtead experiments, and to which I gave the name of a "cultivation-tank." The object of this arrangement is to allow the sewage to impinge upon the surfaces of stones, with which the tank is filled, and which provide a permanent nidus or resting-place for the anaerobic bacteria. Whether this is the best arrangement possible may be called in question, but at any rate it is the one which has given far higher results than any other as regards the final effluent it discharges from the filters. The sewage remains in the "cultivation-tank" for a period that depends upon the ratio between the rate of flow of the sewage and the cubic capacity of the tank, after deducting the displacement due to the flints or stones, and this must necessarily vary much longer during the night, and much less during the day, and so on. In order to meet the case of the house being empty or full, the tanks are arranged in a series of four. All irregularities are no doubt a disturbing factor, but from the recent experiments referred to a considerable range of variation makes no material change in the results. The effluent from the cultivation-tanks escapes at practically the same level as the intake, and is then carried in a pipe to a distributing apparatus, known as Phidian's, which is self-acting, and is revolved by the weight of the liquid itself, which falls evenly over the surface of the filter and discharges by its own gravity, first through 3ft. of graded filtering material, and then through another pipe and distributor over and through another filter which was provided to meet the case of having to discharge into a river celebrated for its trout. Although this arrangement is practically the same in most respects as the one which I used partly as regards the preliminary anaerobic tank in 1892, and wholly in the Ashtead experiments in 1897, I do not think it fails in any way to give effect to the most advanced ideas of the present day, but it has one great disadvantage and that is its cost. Although I have devoted nearly twenty years to its development and have contributed a full share of my time in attempting to put the whole subject on a more scientific and satisfactory footing, I cannot but think that in the case of country houses, at any rate, there must be some more simple and inexpensive means of arriving at equally satisfactory results. I must also admit that, although the apparatus I have described was based upon the results of long experience, it, too, has been carried out to some extent by rule of thumb, and it is a question with me as to whether it would not have been better to get the actual facts beforehand with regard to this particular sewage. The difficulty is that doing so would have entailed the employment of a chemist and the use of a testing-apparatus beforehand, which in the case of small installations would be regarded as too expensive, though in nine cases out of ten it would be far the cheapest procedure in the long run.

In towns, where millions of pounds of the ratepayers' money have been absolutely wasted upon schemes that have been approved by the Local Government, but have proved futile, it is a different matter, because in such schemes the cost of arriving at definite information and safe conclusions beforehand would be trifling, whereas in the case of an ordinary country house it may be prohibitive.

Nuisance from Smell.

One thing I ought to refer to is the question of nuisance arising from smell in small bacterial installations, and the other is that of the attention required to keep them in proper working order.

I have found that in cultivation-tanks and similar arrangements there is a period in their maturing that generally occurs about a fortnight from the sewage being first applied, when very offensive odours may be expected, but that this passes off in a few days, and afterwards smells only occur during certain changes in the weather that are not frequent, such as when it is thundery or during a very low barometric pressure. This, of course, is not pleasant, but in the light of recent knowledge there is no reason to suppose that these odours have any really bad effect on health. Of course, this may not hold good in the case of nervous people who make up their minds that an illness and a smell are in the nature of cause and effect, because they noticed a smell so many days before the illness commenced, but the experience of those who have to deal constantly with sewage works, and who are an exceptionally healthy body, shows that these smells are not dangerous. The case of Birmingham may be quoted, where twenty millions of gallons of septic sewage are being actually sprayed into the atmosphere within a short distance of the town without a protest of any kind. This is, I think, carrying matters too far, and, even if my prediction that Birmingham will one day have a rude awakening by reason of an epidemic of some sort, in any case the system is most offensive.

When these cultivation-tanks receive a little intelligent attention they go on doing their work for years without trouble of any kind. One installation occurs to me which was put down by Mr. Philip Webb about fifteen years ago in the neighbourhood of East Grinstead, and has worked quite satisfactorily ever since.

Where a sufficient fall is available and an efficient system of bacterial filtration adopted there is no difficulty in disposing of the effluent by passing it into any stream that is not used for drinking. In the case of Staines it is allowed to pass into the Thames direct from the filters. When filtration is not available it requires a very porous soil to admit of the discharge being disposed of in underground open-jointed pipes. In such cases it is better to pass it through long shallow channels on the surface of the land, though this, of course, can only be done when the necessary land is available.

I still think that some more simple devices may be found for dealing with the drainage of country houses than those which I have described, and I hope it may fall to the lot of some of the younger members of the Architectural Association to discover them.

EDINBURGH BUILDING TRADES EXCHANGE.

The annual meeting of the Building Trades Exchange of the City and district of Edinburgh was held in the Exchange Rooms, 61, Lothian Road, Edinburgh, on November 4th, Mr. W. Graham-Yooll presiding. The report by the directors for the past year was submitted, along with the balance sheet and profit and loss account. In moving the adoption of the report, the chairman regretted the continued dulness in the building trade, which had had its effect on the Exchange, as several members had given up their membership. He regretted that more advantage was not taken of the Exchange premises, and urged builders and others connected with the building trade to give the Exchange all the support they possibly could, for its usefulness had been demonstrated over and over again in times of strikes and other labour troubles. The report was unanimously adopted. Messrs. John Howden, ironmonger; Robert Lamb, builder; and William Patterson, venetian blind-maker, were re-elected to the board of directors, and Mr. Adam Loch, asphalter, was also elected for the first time. Mr. A. Davidson Smith, C.A., was re-elected auditor.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Nov. 24.	GARDEN CITY PLAN, BURY, LANCS. In connection with the forthcoming exhibition of cottage designs in the Bury Art Gallery, the Bury Housing and Town-planning Association offer three prizes for a design for laying out a garden city suburb within the confines of the Borough of Bury. First prize £5; second prize £3; third prize £1 10s. Designs should be sent to Mr. H. Townend, Curator, Art Gallery, Bury, Lancashire.
Nov. 30.	HERNE BAY PAVILION ON PIER. Herne Bay Urban District Council invite competitive drawings for a pavilion to be erected on the proposed extension of the pier at a total cost not exceeding £4,000, exclusive of architect's commission. Premiums of twenty-five guineas and ten guineas. Plan of the site and copy of the conditions may be obtained from J. Jubb, Clerk to the Council, Town Hall, Herne Bay. Deposit: one guinea.
Nov. 30.	TECHNICAL AND SECONDARY SCHOOL, WORKINGTON. The Cumberland Education Committee invite architects to submit sketch plans with outline specification and estimate for a technical and secondary school in the Borough of Workington, Cumberland, for about 300 pupils of both sexes. Further particulars and conditions upon which plans will be received may be obtained from the undersigned on receipt of a stamped and addressed foolscap envelope and the payment of a deposit of one guinea. Deposit returned if all papers sent are returned within seven days. C. Courtenay Hodgson, Secretary, The Courts, Carlisle.
Dec. 1.	TRALEE. CARNEGIE LIBRARY AND TECHNICAL SCHOOL. Cost not to exceed £4,500. Premiums of £20 and £10 for design placed first and second by the assessor. Copies of instructions and conditions from the Town Clerk, Tralee.
Dec. 1.	PUBLIC PARK PLAN, BANGOR (COUNTY DOWN). The U D. Council offer a premium of £30 for the best scheme for laying out a public park, twenty acres in extent. Premium to include all expenses of successful competitor, whose designs become the property of the Council. Schemes to J. Middleton, Town Clerk, Town Hall, Bangor, County Down.
Dec. 11.	MINEHEAD. SHELTER, with cloakroom and lavatories, on the Beach, the whole expense of which is not to exceed £3,000. Premium of £20. Plan of site and conditions from L. C. Webber-Incledon Clerk to U.D. Council, 16, Park Street, Minehead, Somerset.
Dec. 18	TRAINING COLLEGE FOR TEACHERS, Kirkstall Grange, Far Headingly, Leeds. Architects practising in Leeds are invited to submit competitive designs for the above College. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed Assessor. Copies of the conditions of competition and instructions, a plan of each floor of the educational blocks and of the hostel blocks, also an estate plan, showing a suggestion for grouping the various buildings, may be obtained from James Graham, Secretary for Education, Education Department, Leeds. Designs to be delivered not later than 12 o'clock noon. Deposit: £2 2s.
1910. Jan. 31	NATIONAL MUSEUM OF WALES. The Council desires to receive competitive designs for the erection of a new National Museum at Cardiff. Three premiums are offered of £200, £150, and £100, for second, third, and fourth. The Council have appointed Sir Aston Webb, R.A., Mr. John J. Burnet A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A., as Assessors. Particulars and plans of the site will be supplied to competitors on payment of a fee of £2 2s., returnable if all papers are returned within 14 days. Inquiries to be addressed to Dr. Wm. Evans, Hoyle, Director of the Museums, City Hall, Cardiff.

(Continued on next page.)

(List of Competitions Open.—Continued.)

Feb. 1.	**OLDHAM, EXTENSION OF THE TOWN HALL.** Restricted to Architects practising or residing in the Borough. Premiums of £50, £30 and £20, for the three designs placed 1st, 2nd and 3rd, and a sum of £5 will be paid to all unsuccessful competitors who send in a complete set of plans in accordance with the instructions. Plan of site, with instructions and suggestions for architects obtainable from E. C. Foote, Borough Surveyor, Town Hall, Oldham. Deposit: 21s.

Isolation Hospital, Aberdare.

Sir William Emerson, F.R.I.B.A., and Dr. W. Williams, County M.O.H., the assessors in the above competition, have delivered their award as follows:

1st premium to Mr. Edward C. H. Maidman, 13, South Charlotte Street, Edinburgh.

2nd premium to Messrs. Stockdale, Harrison and Sons and Howard H. Thomson, F.R.I.B.A., joint architects.

3rd premium to Mr. E. Montague Thomas, 37, Old Queen Street, Queen Anne's Gate, Westminster, S.W.

Eltham Parish Hall.

In the above open competition the assessor, Mr. T. Lempriere Hesketh, F.R.I.B.A., selected the joint design submitted by Messrs. Moscrop-Young and Glanfield and Percy J. Waldram, F.S.I., of Buckingham Street, Charing Cross, W.C., who have been appointed architects for the work by the Building Committee. Sixty-three designs were sent in.

Our Plate.

The Red House, Cromer.

The Cromer residence of Sir Francis Layland-Barratt, Bart., M.P., has been built for him in accordance with the plans of Messrs. George J. Skipper, F.R.I.B.A., and F. W. Skipper, of Norwich, by Mr. George Riches, builder, of Cromer, on a site comprising several acres of land, having interesting views across the sea, lighthouse, cliffs, and golf links. The plans sufficiently explain the nature of the accommodation. The exterior has been carried out almost entirely in brickwork, stone only being sparingly used. The roofs are covered with Bedfordshire red tiles.

Mancroft Towers, Oulton Broad,

Mancroft Towers, the residence of Col. Philip E. Back, stands in a commanding position on an eminence overlooking the Waveney Valley, whence views many miles in extent can be obtained across the surrounding country. The building has been designed according to instructions in a simple and plain manner, after the style of old Tudor brickwork, of which there are many good examples in the Eastern Counties. No stone has been used for decorative purposes, the mullioned windows and all other features having been carried out entirely in brick. The interior has some interesting features, of which the hall on the ground floor carried up higher than the rest of the ground floor rooms, and the long gallery on the first floor extending the entire length of the building, are leading examples. An electric plant has been put down for the purpose of supplying the building with water, and the whole of the establishment with electric light. A suitable lodge adjoins the entrance gate. Messrs. J. Youngs and Son, of Norwich, were the general contractors, and the architects Messrs. George J. Skipper, F.R.I.B.A., and F. W. Skipper, Norwich.

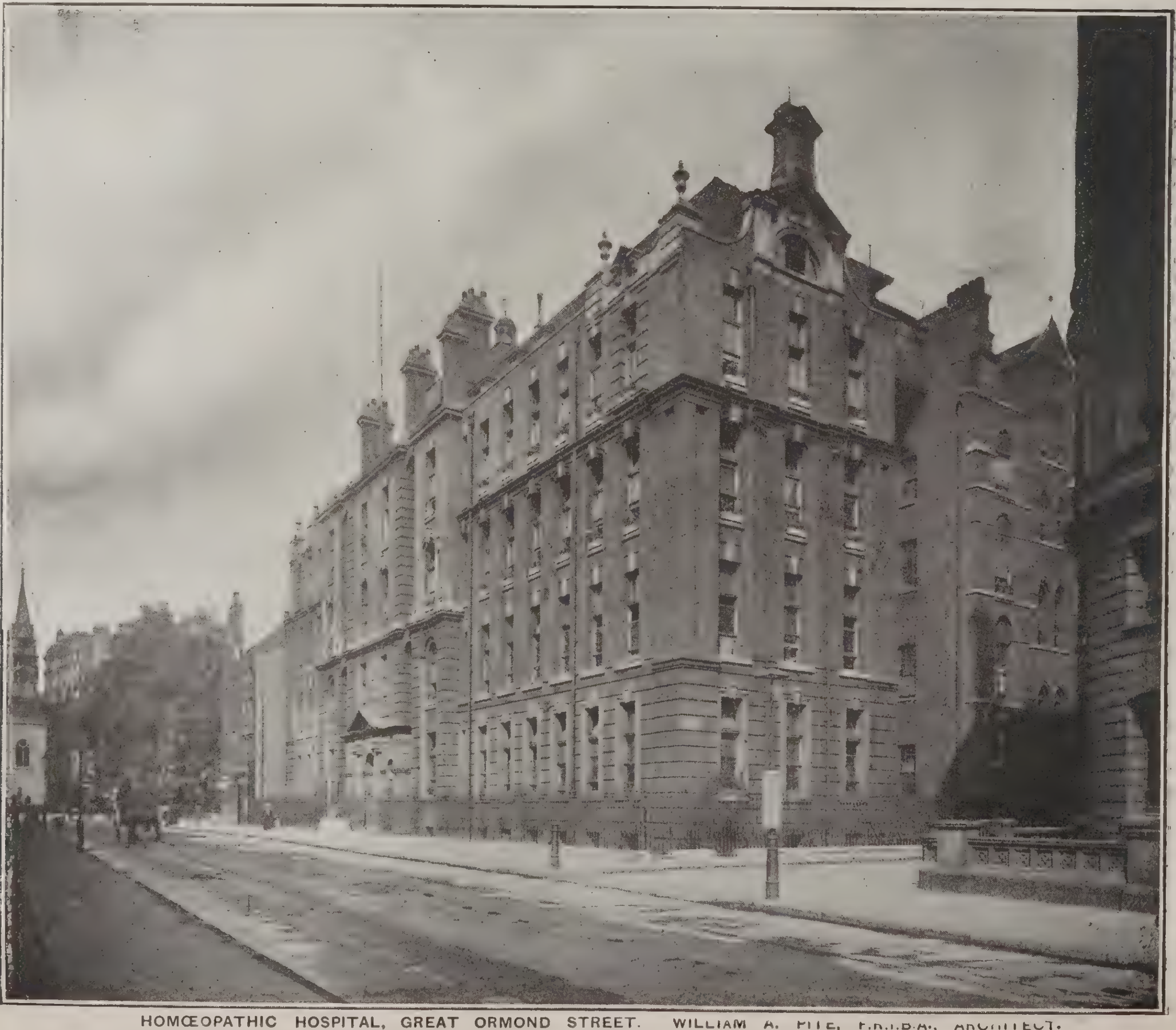
15, Carteret Street, Westminster, S.W.

These premises were designed for the North British Plumbing Company, Ltd., and were built by Messrs. Trollope and Colls in 1906. The ground plan is schemed with an office and goods entrance. The latter leads down a sloping way to a large store for materials. The whole of the front first floor is occupied by a board room, which is separated from the engine and machine shops by a corridor. This effectually keeps the board room quiet. The front is built of Crowboro' stocks, and Lawrence's red seconds. The stonework is Doulting. The following is a list of the subcontractors: Drainage, The North British Plumbing Company, Ltd.; wrought ironwork, Messrs. Starkie Gardiner; casements, Messrs. R. and E. Pearce; door furniture, Messrs. N. F. Ramsay and Brother. The total cost was £2,000.

LONDON'S PROPOSED NEW BRIDGE.

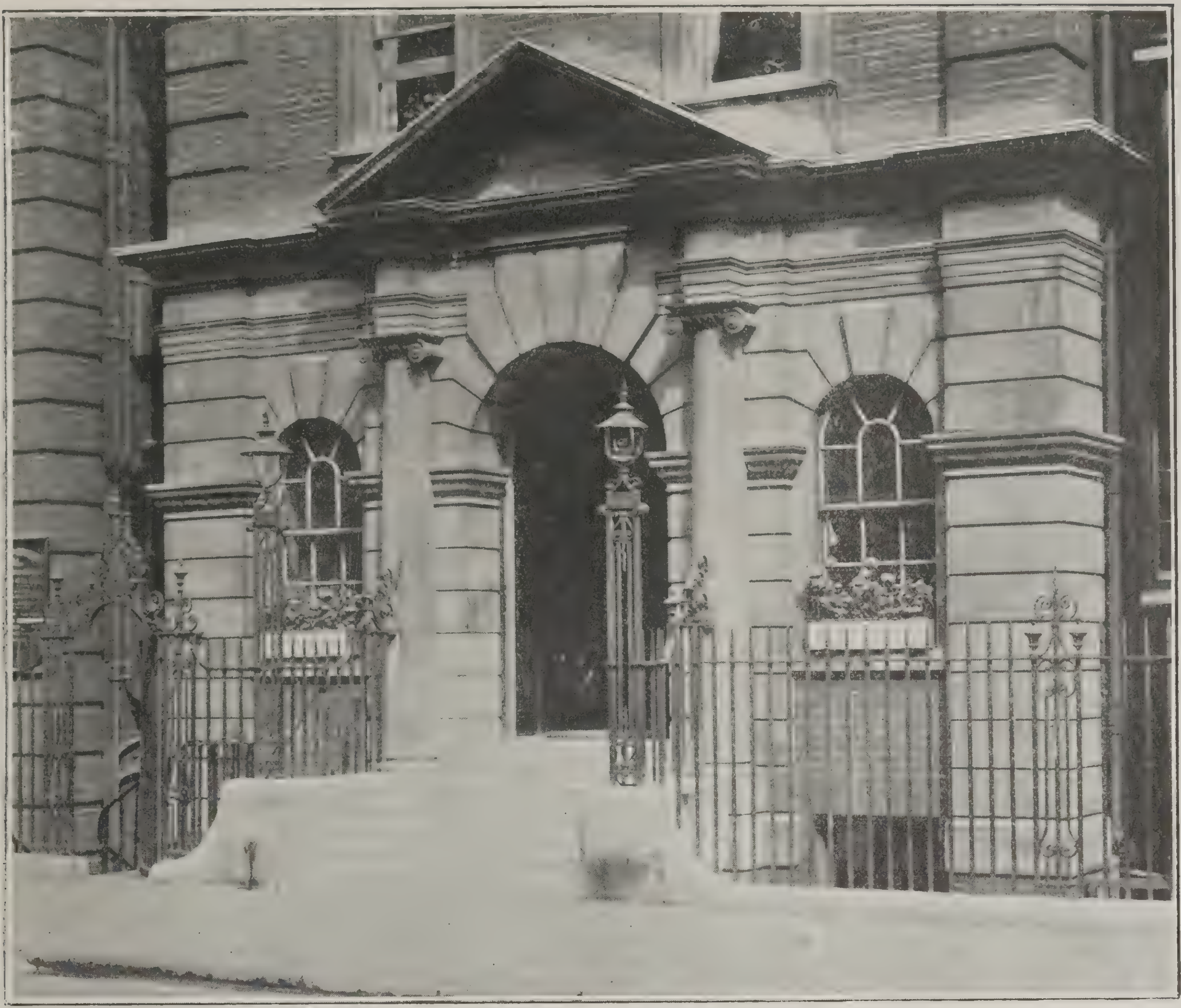
The Bridge House Estates Committee of the City of London Corporation have submitted to that body an important report relating to bridge accommodation in the City.

In July last the Committee recommended that a new bridge should be constructed at an estimated cost of £1,646,983, and that the gradients of Southwark Bridge should be improved at an estimated cost of £231,000. The Committee were instructed to reconsider the matter and to submit a further report. This they have now done. The chief objections to their scheme were that it was not proposed to widen Southwark Bridge; that the proper way of dealing with north and south traffic was by subway or tunnel under the river; that the east and west thoroughfares needed



HOMŒOPATHIC HOSPITAL, GREAT ORMOND STREET. WILLIAM A. PITE, F.R.I.B.A., ARCHITECT.

The Homœopathic Hospital was rebuilt in 1894, taking the place of several old houses which had been adapted for the purpose.



DETAIL OF ENTRANCE DOORWAY, HOMŒOPATHIC HOSPITAL, GREAT ORMOND STREET, WILLIAM A. PITE, F.R.I.B.A., ARCHITECT.

The building shown by the general view on page 360, of which the above is a detail, was designed by Mr. Pite, who also extended the Nurses' Institute at a cost of about £33,000. The building is now being extended to Queen Square, the architect being Mr. Edwin T. Hall.

widening; that the suggested new bridge was not wanted; and the destruction of rateable value. These criticisms the Committee answer in some detail. They say that it would require two tunnels of 30ft. diameter and one of 25ft. to give approximately the same accommodation as that provided by a bridge, whereas the cost of construction would be £2,298,000, and the cost for land £2,224,500, making a total of £4,522,050. The revenues of the Bridge House Estates are not applicable to the widening of east and west thoroughfares or the making of new routes.

As to whether the new bridge is wanted, the Committee quote the opinion of the Royal Commission on London traffic that if it be practicable to pierce new arterial streets and widen existing streets every kind of locomotion will be facilitated. The Commission advocated the construction of two main avenues through London—one from east to west and the other from north to south. Such a proposal obviously involved the erection of a new bridge. The Bridge House Committee suggest the utilisation of the thoroughfare leading from the General Post Office to Islington and Holloway. They do not consider that the rateable value of the City would be seriously affected by the amount of property required for the new bridge. The rateable value of the City, notwithstanding the many street improvements, has increased from £4,839,816 in 1901, to £5,479,000 in the present year.

The Committee, in now re-presenting their report on the same lines, say that the suggested new bridge has been altered on the southern side. This alteration gives a straighter approach, but will result in a gradient of 1 in 40, as compared with their former plan of 1 in 45, and necessitates raising the level of Southwark Street. They consider that the schemes they suggest are the best means of dealing with the subject. All the evidence, they say, points to the urgent necessity for a new bridge if present and future needs are to be met, and they are strongly of opinion that the Corporation should undertake its construction in the public interest out of the Bridge House revenues. Having given the reference their serious and earnest consideration, they again recommend the construction of a new bridge at a cost of £1,646,083. They further suggest that Southwark Bridge should be reconstructed at a cost of £261,000. The report is signed by the chairman (Mr. Deputy Algar) and 24 members of the Committee, one of whom, however, is opposed to the expenditure on the reconstruction of Southwark Bridge. A member of the Corporation has given notice of an amendment to reject that portion of the scheme which provides for the erection of a new bridge.

Societies and Institutions.

Junior Institution of Engineers.

The annual general meeting of this institution was recently held at the Royal United Service Institution, Whitehall. The Council's annual report which was presented showed that the membership has increased to 1,063, 85 elections and transferences having taken place during the past year. Nine ordinary meetings had been held, and 29 visits to works made, covering practically every branch of engineering. The summer meeting in the Midlands had proved very successful. Birmingham had been made the centre on account of the Institution's first local section having been established there during the year. Other salient features in the report included reference to the Gustave Canet Lecture, delivered on the twenty-fifth anniversary of the Institution by Lieut. A. Trevor Dawson, R.N., on "Engineering of Ordnance"; awards for Papers; Durham Bursary; and the Monthly Journal and Record of Transactions, the volume for the year under review consisting of 758 pages, together with illustrative plates. The scrutineers reported that the election of officers, etc., had resulted as follows: Chairman, Mr. Geo. T. Bullock; vice-chairmen, Mr. J. Wylie Nisbet, Mr. F. D. G. Napier; hon. librarian, Mr. S. V. Cooke; hon. auditors, Messrs. H. Norman Gray and Henry Cook; members of Council, Messrs. G. D. Harrison, Jas. Oswald, C. H. Smith, and Percy L. Young; provincial members of Council, Messrs. C. T. Briggs (Newcastle-on-Tyne); Ernest King (Sheffield), R. H. Parsons (Peterborough), Eustace W. Porter (Southampton), T. P Hosegood (Bristol), Adam Hunter (Glasgow), W. E. Lilly (Dublin), H. F. Hunt (Pembroke). The annual meeting of the benevolent fund then took place, the statement of accounts showing that the amount standing to its credit is £188 19s. 9d. A paper was then read by Mr. T. A. Watson, Assoc.M.Inst.C.E. (member) on "The Reinforced Concrete Construction of the new General Post Office buildings, London." After giving a general description of the building, the author proceeded to deal with the various considerations affecting the design and construction of the walls, during which comparison was made to walls of similar strength constructed in brick. The retaining walls, floors, method of re-inforcing and columns were treated, dimensions and number of re-inforcing bars. Points in connection with jointing, stirrups and special features in the building were next touched upon, including floors, etc., on cantilevers, footbridge, chimney, tunnels under King Edward Street, and staircases. The methods of dealing with the difficulties which were met with during construction of the retaining walls, etc., were described, and the composition and mixing of the concrete used in the work were then entered into. The paper concluded with questions relating to testing of steel and experiments with tests columns. An animated discussion followed, in which Messrs. L. H. Rugg, Hy. Adams, H. M. Martin, P. J. Waldram, William Dunn, E. F. Etchells, R. Vawdrey, and B. E. Parry took part, and the proceedings terminated with the announcement of the ensuing meeting on the 16th November, when Engineer Vice-Admiral Henry J. Oram, C.B., would deliver his presidential address on "Recent Warship Machinery."

Institution of Municipal Engineers.

A meeting for the purpose of forming the District Committee for District No. 4 (comprising the counties of Cambridge, Huntingdon, Norfolk, Northants, and Suffolk) will be held at the Royal Hotel, Norwich, on Saturday, November 13th, at 2 o'clock.

Leeds School of Art.

In the first of a series of four lectures on the arts in England at the close of the seventeenth century, delivered at the Leeds School of Art, Mr. Butler Wilson dealt with the Anglo-Classic or Seventeenth Century style of architecture. The lecturer said he had selected the subject on which he proposed to address them because it was to the work of that period we were so largely indebted for the tradition which was being developed by many of the examples of the architecture and applied arts of to-day. He proceeded to trace the influence of Inigo Jones, describing some of his works, including the Banqueting House in Whitehall, and Greenwich Hospital. He also reviewed the work of Sir Christopher Wren, showing on the screen St. Paul's Cathedral, Hampton Court Palace, and a house in West Street, Chichester. It was pointed out that although many buildings of this period were thought by some to be deliberate designs in the manner of the Italian Renaissance, the works of Inigo Jones and Wren were unmistakably English. Their work was the work of men who had absorbed all that they could learn from the art of another country, and who, by the force of their own characters, were able to make that art their own. Among the lantern slides exhibited was one showing a plan of the gigantic palace designed by Inigo Jones for James I., but which, with the exception of the Banqueting House in Whitehall (intended to form a small part of the palace), was never built.

Institution of Municipal Engineers.

At a meeting of the Council of the Institution of Municipal Engineers, held on October 27th, fourteen applications for membership and seven for studentship were considered. Of the former, twelve were accepted; of the latter, seven. The roll of the Institution is now: Members, 630; students, 89; total, 719. It was considered advisable that a class of associate members should be attached to the Institution, such associate members to be entitled to the privilege of corporate membership, and it was suggested that the following should be the clause in the by-laws in respect thereto: "Associate Members.—A candidate for election or transfer to the class of associate member must produce evidence to the satisfaction of the Council: (1) That he (a) has received a good general and scientific education, (b) has been regularly trained in those branches of engineering comprised within the duties of a municipal engineer, and (c) has had subsequent employment in the service of any municipal authority of which one year at least has been spent in an important position of responsibility in the direction or design of municipal work; or (2) (d) has had such experience in the design or execution of important engineering work for any municipal authority as to qualify him in the opinion of the Council for the distinction of associate membership." The opinions of members on the proposal, to be submitted before the next council meeting, to be held November 27th, are invited. It was suggested that "the Council shall at their first meeting after the annual election have power to appoint an honorary librarian from among the members of the institution, this official to be an ex officio member of the council until the next annual election." The opinions of members are invited on this proposal also. It was decided that arrangements be made for a general meeting—followed by a social evening, to which latter ladies would be invited—to be held in December. A committee with power to act was appointed to arrange the details. Members who are willing to submit papers for reading at this or a subsequent meeting are particularly requested to communicate at once with the Secretary. The Secretary was instructed to arrange for a visit to works for some day in November. It was decided that the joint meeting of the Council and the honorary secretaries of the various district committees should be held on November 27th, the day of the next Council meeting. A letter was read from Mr. Charles Vawser, of St. Mark's Lodge, Woodville Road, New Barnet, with reference to a proposed municipal golf tournament. Members requiring particulars are requested to write to him. A letter was read from the honorary secretary of the Municipal Engineers' Imperial Defence Committee, asking for the support of the Institution in the proposed scheme for the formation of a municipal engineering corps. The Council, while expressing their accordance with the general principles involved, resolved to defer consideration of the letter until their next meeting.—B. WYAND, Secretary, 39, Victoria Street, S.W.

Glasgow and West of Scotland Technical College Architectural Craftsmen's Society.

At the second meeting of the session of this Society, held in the College Buildings on 22nd Oct., Mr. T. L. Watson, F.R.I.B.A., I.A., delivered a lecture entitled "The Autobiography of a Cathedral," taking as his subject the interesting Glasgow fabric. In the course of his lecture Mr. Watson remarked that there is no building the life history of which is more fully recorded in its architecture, and few which have an autobiography of such interest. The lecturer dwelt at considerable length on the beautiful lower vault, and pointed out its value as an archæological document. The examination of the vaulting resulted in the discovery of a succession of architectural periods showing in brief that the cathedral was begun by Bishop Walter in the south-western compartment of the lower church. The work was continued by Bondington, and about 1240 the vaulting of the north and south aisles was completed, the middle compartment, however, and the eastern aisle, being left unvaulted and open to the heavens. Hereafter the other parts of the building were completed, still leaving the middle compartment, and the obvious explanation of this was that the whole material of the choir triforium and clerestory walls had to be brought into the middle compartment on the level of the soil, and hoisted thence to its position on the walls. The lecture was illustrated by several drawings. At the close Mr. Watson was cordially thanked for his lecture.

Scottish Building Trades Federation.

For some considerable time, the Inverness Building Trades Federation had been endeavouring to get the local conditions of contract recognised by architects. Some time ago the local builders and architects agreed to certain general conditions of contract, but one firm of architects objected. During the past week or two, the position of matters has become accentuated. The Highland Railway Co. are about to erect an hotel at Strathpeffer. A deputation of the local Federation waited upon the chairman of the Highland Railway Co., and explained their position to him. He reported to a meeting of the railway company's directors, who, however, decided that they cannot interfere with the architects. Consequently, the Federated Inverness contractors decided not to tender for the work of the Strathpeffer Hotel; and the position has been fully reported to the other branches of the Scottish Building Trades Federation.

SHEFFIELD SEWAGE WORKS.

The first section of the extended and reconstructed sewage works of the Sheffield Corporation at Wincobank, about three miles from the centre of the city, was opened on October 28 by the Lord Mayor. The scheme thus inaugurated marks the first stage in the work of substituting the bacteriological process of sewage purification for that of lime precipitation, followed by aeration over weirs and continuous filtration through coke. Experiments in the bacteriological treatment have been made by the corporation for ten years past, and it was ultimately decided to adopt a scheme for purification by this process, consisting of continuous-flow settling tanks and contact beds. The work, which includes the remodelling of the present system, comprises the following:—New outfall sewer and main valve chamber, two new catch-pits and alterations to the two existing catch-pits, nine new settling tanks, and conversion of the existing tank area into eight additional tanks, deepening the two existing sludge wells and remodelling the pumping plant, 60 half-acre contact beds, 16 acres of storm beds, bridge and siphons across the river Don, roads, railways, etc. The estimated cost of the work is £270,369, exclusive of land and second contact beds. The gross area of the land which will ultimately be available is 204 acres, and the approximate cost £86,000. The works will be capable of dealing with a maximum rate of flow of 64½ million gallons in 24 hours, this quantity being determined chiefly by the fact that the Local Government Board require provision for treating in periods of storm about six times the dry-weather flow. The scheme is based on a dry-weather flow, including trade wastes, of 12 million gallons a day. The filling material of the contact beds is screened clinker, graded from coarse to medium, and fine on the top, and the average depth is 4ft., the floors being graded to the outlets. After leaving the settling tanks, the sewage will pass along the main conduit and branches to a feed culvert communicating with a circular distributing chamber in the centre of each bed, whence it will be distributed over the surface by means of channels formed in the surface of the filling. The works now opened consist of the altered catch-pits and sludge wells, six new settling tanks, and 12 contact beds, and will treat a maximum flow of six million gallons a day. This quantity will be rapidly increased to 12 million as 12 other contact beds, the construction of which is completed, are filled with clinker. The scheme has been designed by and carried out under the supervision of Mr. C. F. Wike, the city engineer of Sheffield, and the cost of the work so far carried out has been about £100,000. The contractors are Messrs. Logan and Hemingway.

Obituary.

Mr. H. Hall, F.R.I.B.A.

Mr. Henry Hall, F.R.I.B.A., who has died at 20, Quernmore Road, Stroud Green, and was formerly of 19, Doughty Street, W.C., had designed many private buildings in Somerset and Dorset. He was one of the nine competitors selected for the final competition for the new Government offices at Whitehall. He restored Nelson's house after its destruction by fire, and built many banks (including the head office at Salisbury) for the Wilts and Dorset Banking Co.

CONCRETE AND STEEL SECTION.

(MONTHLY.)

Testing Completed Reinforced Concrete Buildings. Regarding the methods of testing completed structures of reinforced concrete, in order to get them passed by the authorities, or to prove that they are thoroughly sound and satisfactory, there are various methods that have been suggested and rules advocated for observance. Perhaps the most sound method is that provided for by the Prussian Government Regulations which were issued on May 24th, 1907. The translation of these is as follows:—"Compression cubes to be provided, 30 cm. (12 inches) side, to be dated and sealed. Tests made by the authority in approved manner. Tests may be made on the works by means of an officially controlled press. Portions of building in positions determined by building authority are to be exposed if desired, so that the mode of construction can be seen. Special tests may be made to determine hardness and strength. Should doubt exist as to hardness and correct mixing, test pieces may be cut out of the finished building. If loading tests are considered necessary, they are to be carried out under the instructions of the building authority. Loading tests are not to be made in less than 45 days after setting, and are to be strictly limited to what is considered necessary by the authority. When a floor is tested, the load added is not to exceed one-half the weight of the floor and one-and-a-half times the evenly distributed working load. When the working load is more than 1,000 kg. per sq. m. (205lbs. per sq. ft.), this may be diminished down to once the working load.

When a strip in a floor or decking is to be tested, the load is to be evenly distributed in the midst of the floor, over a strip of length equal to the span and width one-third of the span, but in any case not less than 1m. (39 inches). In this case the test load must not exceed the weight of the strip and twice the working load. The weight of floors is to be reckoned as defined below. In testing columns or piers, unequal loading of the building, and loading of the foundations beyond the permissible limit, are to be avoided."

To the foregoing we may add the French, Austrian and Swiss Rules:—

French Government Rules, Oct. 20, 1906:—

"Conditions of test and time that shall elapse before structures are brought into use must be inserted in contract, and also the maximum deflections as far as practicable.

The time to elapse before use of structures must be 90 days for structures of primary importance, 45 days for ordinary constructions and 30 days for floors.

Measurements to be taken during tests which are likely to be of scientific interest to engineers.

Test loads on floors shall be the dead and super-imposed loads acting over the whole area of the floor, or at least upon a complete panel.

The loads to be left on for at least 24 hours, and deflection to cease after 15 hours."

Austrian Government Regulations, Nov. 15, 1907:—

"Breaking tests of whole or part to be made on request.

No test before expiration of 6 weeks after completion of ramming.

Loading to be such that effect is same as dead load plus 1½ specified superimposed load. No cracks or permanent deformations.

For breaking tests, load to be gradually increased.

Breaking load not to be less than 3½ times the total dead and superimposed load, less the weight of the member."

Swiss Engineering and Architectural Society, Provisional Specification, August, 1903:—

"Test loads to be at least 50 per cent. greater than working loads allowed in calculations.

Test loads not to be put on until 45 days have been allowed for setting.

If possible, deflections at different stages of loading to be noted."

Bending Moments. There is considerable difference of opinion regarding the manner in which bending moments should be taken, and we have collected together the more or less official rules put forward by the Joint Committee on Reinforced Concrete appointed by the Royal Institute of British Architects, who issued their report in May, 1907, together with the French, German, Austrian, and Swiss regulations in the same respect. From these it will be gathered that while the British Committee thinks that for continuous spans the bending moment $\frac{W.L.}{12}$ is sufficient, on the Continent, as a rule $\frac{W.L.}{10}$ is adopted. The Austrian method, however, seems to be the most correct theoretically, and in any official rules that are drawn up latitude ought to be allowed to determine each case on its merits. There should be no hard and fast rules as regards bending moments, for it depends upon how a structure is reinforced and the nature of the loading, both superimposed and dead loads, as to the bending moment which ought to be taken. By designing a structure for the most unfavourable condition of loading, stability is insured. That is the Austrian method, and we think it would be hard to improve upon, except that we have our doubts about the advisability of limiting the continuity to three spans. If special attention is given to making more than three spans act continuously we see no reason why the designer should not be given the opportunity of doing so.

The Rules of British Reinforced Concrete Committee, issued in May, 1907, are as follows:—

"Spans. These may be taken as follows: For beams the distance from centre to centre of bearings. For slabs supported at the ends, the clear span plus the thickness of slab. For slabs continuous over more than one span the distance from centre to centre of beams.

Bending Moments. In the most ordinary case of a uniformly distributed load of—W—lbs. per inch run of span the bending moments will be as follows:—

(a) Beam or slab simply supported at the ends. Greatest bending moment at centre of span of 1in. is equal to $\frac{wl^2}{8}$ in. lbs.

(b) Beam continuous over several spans, or encastré or fixed in direction at each end. The greatest bending moments are at the ends of the span, and the beam should be reinforced at its upper side near the ends. If continuity can be perfectly relied on, the bending moment at the centre of the span is $\frac{wl^2}{24}$, and that over the supports $\frac{wl^2}{12}$. If the continuity is in any way imperfect, the bending moment at the centre will in general be greater, and that at the supports less, but the case is a very indefinite one. It appears desirable that generally in building construction the centre bending moment should not be taken less than $\frac{wl^2}{12}$. The bending moment at the ends depends greatly on the fixedness of the ends in level and direction. When continuity and fixing of the ends, whether perfect or imperfect, is allowed for in determining the bending moment near the middle of the span, the beam or slab must be designed and reinforced to resist the corresponding bending moments at the ends. When the load is not uniformly distributed the bending moments must be calculated on the ordinary statical principles."

The French Government Rules, issued on October 20, 1906, are as follows:—

"For freely supported or continuous beams usual values may be applied.

For partially fixed ends, the bending moment at centre of span for uniformly distributed load to be $\frac{wl^2}{10}$

If L and B are the spans of a rectangular slab, the bending moment as for a beam of span B can be decreased by co-efficient $\frac{1}{1+2\frac{B^4}{L^4}}$, or for span L the bending moment as for beam of span L with the co-efficient or [illegible] reduction of $\frac{1}{1+2\frac{L^4}{B^4}}$ moment as for beam of span L with the co-efficient of reduction of

The Prussian Government Regulations, issued on May 24, 1907, are as follows:—

"Span for beams to be free opening plus one support.

Span of continuous decking to be distance from centre to centre of supports.

For freely supported decking, the free span plus the thickness of the decking.

Bending moments and reactions to be determined by formulæ for freely supported or continuous beams according to mode of support and distribution of load.

For continuous decking, the bending moment at centre of span is to be taken as four-fifths of that which would exist in a freely-supported panel, unless the moments and reactions can be ascertained.

The above rule holds good for beams, excepting that no end moment is to be taken into account unless special arrangements have been made to fix the ends.

Decking and beams only to be reckoned as continuous if resting on solid supports in one plane, or on reinforced concrete beams.

Continuity not to be assumed over more than three spans."

The Austrian Government Regulations, issued in Nov., 1907, are as follows:—

"Spans for freely supported and continuous beams to be from centre to centre of support.

Beams extending over several supports must be computed as for continuous beams, incidental unfavourable loading being taken into account. Continuity not to be assumed as extending over more than three spans.

Elastic deformation in supports of continuous beams to be taken into account.

In beams the possibility of fixing moments at the supports must be provided for by suitable reinforcements.

If L and B are spans of rectangular slab, and L is not more than one and a-half B, slab being reinforced with equal area of metal both ways bending moment as for beam of span B can be decreased by co-efficient $\frac{L^4}{L^4 + B^4}$."

The Swiss Engineering and Architectural Society's Provisional Specification, issued in August, 1903, provides the following ruling:—

"Most unfavourable disposition of loading to be allowed for.

In continuous or encastré beams the bending moments at centre of spans not to be less than ⅔ the moments at the supports, due to the loading and amount of fixing, and reinforcement over supports is to be provided.

If amount of fixing cannot be determined, the moment at centre of span must not be less than 20 per cent. less than that for a freely supported beam, and that at supports to be at least half of that at centre."

Continuous Beams. In building a monolithic construction like reinforced concrete, it follows that the beams and floor slabs will have continuity of action, and this is usually allowed for in the design. But it is not an easy nor a definite matter to know to what extent we may rely upon continuity. The amount of that continuous action will vary. There are various factors which affect the problem and make its solution indeterminate, so that it must be a matter of judgment as to how much continuity we can depend upon. For instance, supports settle or deflect irregularly, adjoining spans differ in length, the moment of inertia of the section varies, and finally, one bay may be loaded while other bays are not. The loading on the floors varies in amount in different classes of structures, and this affects the continuity also, for it alters the ratios of the live to the dead load of the floor, and therefore the anchorage which, adjoining unloaded spans, provide to decrease the bending moment on the loaded span.

Rules and By-Laws. The Austrian Government rules, which we publish in the preceding page of the present issue, leave enquiriers to determine this continuous action by considering three spans with one loaded, and this regulation is a wise one, but in England the R.I.B.A. Committee thought $\frac{wl^2}{12}$ should be taken as the value of the bending moment of a continuous beam, and $\frac{wl^2}{24}$ as the bending moments over the supports, while in France and the United States $\frac{wl^2}{10}$ is a usual provision for the centre, and $\frac{wl^2}{40}$ over the supports. The R.I.B.A. rule, though better than the French and American bylaws, is, however, not satisfactory. If one bay is loaded and the others not, $\frac{wl^2}{12}$ may approximate nearly to average conditions in practice, but in that case there is usually a negative bending moment over the whole length of the adjoining beams, and no provision is made for it in the rules referred to. Double reinforcement is not customary, but we see that in such a case it may be desirable to prevent the adjoining beams cracking along the top, when the bending moment on the loaded span would be increased. Again, it is all very well to assume that $\frac{wl^2}{24}$ over supports may be good enough for the case of one span loaded, but if all spans are loaded, then if the beam is brought to allow for continuity $\frac{wl^2}{12}$ will probably be the bending moment developed over the support, in which case there will be insufficient steel, and cracks may be caused. This is indeed the case, and we have seen numerous examples calculated in the R.I.B.A. rules thus cracked over supports, while we learn that that is the usual experience in America.

Connections with Columns. But another factor may enter into the problem and affect our determination of the bending moment, viz., connections with columns. In many cases heavily loaded columns stand directly over the supports of beams, and then there is considerably greater fixity of the ends, when, of course, the bending moments on the beams can be more accurately taken as $\frac{wl^2}{24}$ as the centre. Really the proper course to pursue is to take the most adverse condition that may arise in each particular example, and make the parts sufficiently strong everywhere to resist the worst case.

The Factor of Safety. The fact that we put in too much steel and concrete to allow factor of safety means that a girder will act contrary to what it may be designed to do. We may assume that it will act as truly continuous as long as possible, in which case, if we have proportioned the parts, so that we provide less in one place than the most adverse conditions would require, then we shall stress our materials unduly high. Thus, for instance, if we provide for $\frac{wl^2}{24}$ over supports, then when all spans are loaded we should have nearer $\frac{wl^2}{12}$ over supports, which means that our factor of safety would be reduced to half what was at first assumed. Therefore, in such a case, we ought to provide for $\frac{wl^2}{12}$ both at supports and centre, and use double reinforcement also, so as to take up negative bending moment in adjoining spans when one bay is loaded alone. If, however, we pay regard to the partial fixing of ends of beams by columns, we should be still more justified in using this assumption. But if we must strike mean, let us adopt $\frac{wl^2}{16}$ at both centres and over supports.

CONTRACTION CRACKS DUE TO AN ABSORBENT AGGREGATE.

In an investigation of serious contraction cracks in *in situ* concrete, it has been shown that an absorbent stone as an aggregate can be readily responsible for this disfiguration. In this experience it was found that a concrete (6 parts of aggregate to one of cement) was being used for the construction of floors and walls of sewage tanks, and in this work the responsible engineer had specified as an aggregate the sandstone from a certain quarry adjoining the site of the work. This stone it was found on passing through the crusher and concrete mixer became sufficiently disintegrated to provide the requisite amount of sand, and consequently the addition of other sand was unnecessary. The work of construction was commenced in the early part of the year, and except for interruptions caused by frost, the same proceeded satisfactorily, but towards the end of spring large contraction cracks appeared in the concrete, and indeed many of these cracks appeared within one or two days of its being put into position, and as it was thought impossible to avoid these cracks with the cement that was regularly in use, the work was stopped pending an investigation. On inspection it was found that the contraction of the concrete had resulted from the dry absorbent nature of the sandstone used as aggregate. Practically no rain had fallen for three weeks during the period of construction, and an east wind had been generally prevalent, causing the stone to be very dry before being put into use. The larger lumps of aggregate (up to 1½ins.) did not become saturated with water during the mixing of the concrete, and consequently absorbed a quantity of water from the concrete whilst the latter was in process of setting. Thus in addition to the contraction which occurred as a result of this absorption, the concrete also failed to harden satisfactorily, owing to the lack of water necessary for crystallisation. The contractor then reluctantly applied the obvious remedy of soaking the stone for 24 hours before use, and after some extended experience of the use of the aggregate under this new condition, it was reported that the trouble of the contraction cracks had been well overcome.

REINFORCED CONCRETE SYSTEMS.

The Leslie System.

One of the more recent systems of reinforced concrete construction that have come upon the market is that of Messrs. Leslie and Co., Limited, of Kensington Square, London, W. Messrs. Leslie may, however, be said to have really several systems, for they act as general contractors for reinforced concrete construction as well as building of ordinary construction, and execute work designed on several systems belonging to other proprietors, while they also work patented systems of their own, and carry out most of the earlier types of fireproof-floor construction, the patents of which have now run out, or which are invalid. Their view is that none of the special methods, various combinations of which have been termed "systems," of reinforced concrete are applicable to all circumstances. They therefore prefer to have a free hand to meet each special case, and provide the maximum efficiency with economy which their judgment and experience lead them to suggest. Messrs. Leslie and Co.'s name is known better perhaps as general contractors for building work, and they have carried out many important buildings in London and elsewhere, as, for instance, the Royal College of Science, and the foundations of the Victoria and Albert Museum at Kensington (Sir Aston Webb, R.A., architect).

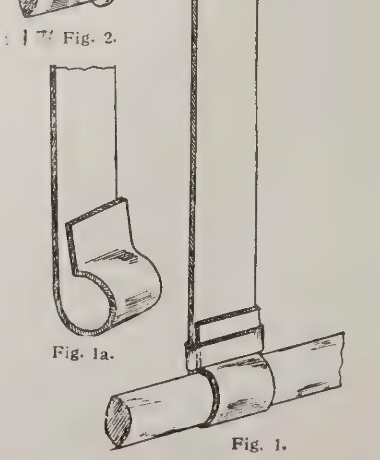
The claims that Messrs. Leslie and Co. put forward for their system of working are as follows:—

(1) They take full responsibility for the work they design and execute, whereas, when work is designed by one firm and executed by another the responsibility is divided and no surety afforded.

(2) Their engineering staff is directly associated with the practical work, and the work of construction is entirely under its control. This means that the workmanship is of the best, and that schemes are designed with an idea of economy in the erection, a matter that is of great importance in reinforced concrete design.

(3) Expenses in the way of establishment charges for a separate organisation are eliminated.

(4) There is a saving of time effected both in the preparation of designs and in submitting estimates, as also in the execution of the



Leslie's linked hangers, stirrups, and binders.

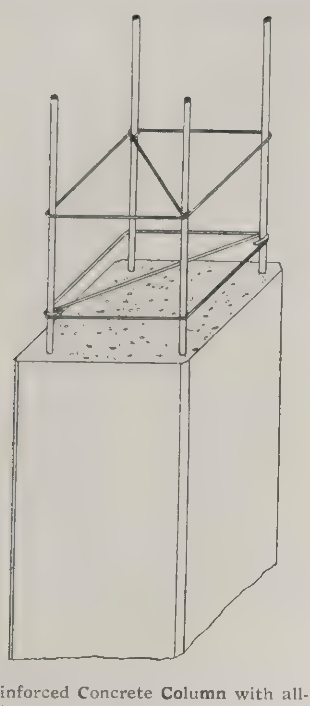


Fig 3.—Reinforced Concrete Column with all-round Wire Links, with Diagonals to reinforce Core.

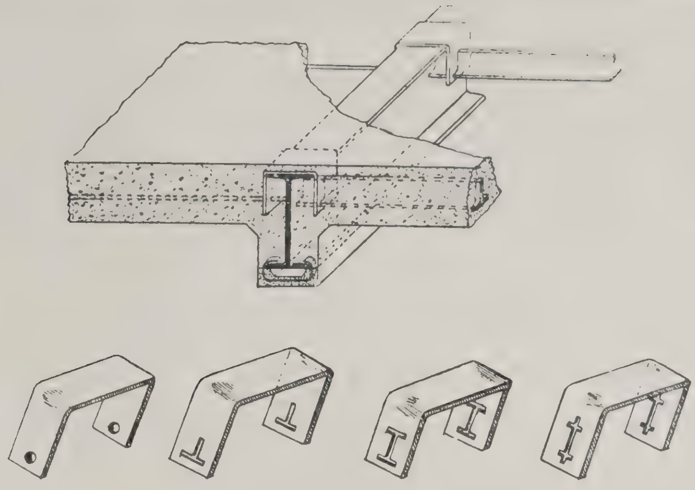


Fig. 5.—Hangers for suspending various Sections of Steel Members between Joists.

work, by the whole job being in the hands of one organisation.

(5) They are prepared to design work employing practically all the mechanical bond bars and sheet mesh reinforcements upon the market. In many cases they say that the ordinary commercial sections are all that is necessary, and these have the advantage that they can be purchased at a lower price than special reinforcements.

(6) The firm is not engaged in pushing one system nor one form of reinforcement to the exclusion of others, but endeavours to meet the wishes of clients in respect to any method of construction and suit themselves to different circumstances.

Contracting Methods.

There are two customary methods by which reinforced concrete is carried out in this country—one we may call the Continental, and the other the American method.

The former consists in a firm of specialist engineers, the proprietors of a system that has been patented at some time, who do not execute the work, but merely submit design and obtain tenders from licensed contractors.

The disadvantages entailed by such a system are, as hinted above, that the execution is divorced from the design, and such firms are not always able to give adequate guarantees for the safety and efficiency of the construction executed under such conditions. The designing firm is paid a royalty, and it is only the contractor who speculates. Very often he is inexperienced in such work, and has insufficient information upon which to estimate. If, then, he makes a mistake, is it to be wondered that he will try to recoup himself by executing the work with as little trouble and expense as possible? And, as he does not know what risks he is thereby taking, the work is scamped.

The second, or American method, consists in a firm who manufactures some special bar or meshwork reinforcement, and who in order to get its specialities supplied, undertakes the work of design. Usually contractors are got to estimate for the execution of the work, but these contractors are seldom licensed, and, of course, the risk of mistakes, scamping and bad workmanship, are, Messrs. Leslie argue, greater than with the "Continental" method. Firms employing the American method do not charge a royalty, but the price of their specialities is proportionately increased.

Messrs. Leslie and Co. admit that some of the special reinforcements are advantageous in certain circumstances, and they are prepared to use them when desired, but they prefer to design the work themselves, so as to use these forms of reinforcement to the best advantage, and so that they can guarantee the work. Also, when required, they will check designs prepared by the American method so as to take responsibility and guarantee the work.

Their method, in short, is to both design and construct the work, and to delegate no part to others, for that shirks responsibility.

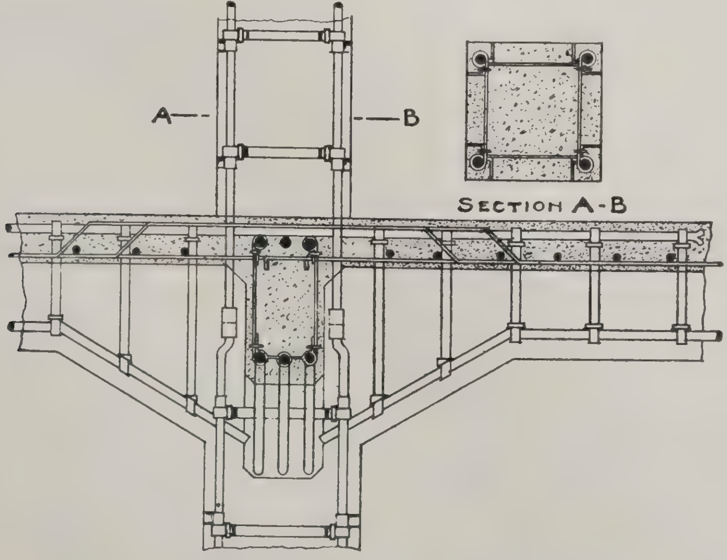


Fig. 4.—Leslie's Linked System of Reinforced Concrete.

So much for the general aspect. Now we can deal with Messrs. Leslie's own special systems for which they hold patents.

Leslie's Patent Shear Members.

A reinforced concrete beam is more or less a trellis girder in which the compression members are formed of concrete, and the tension members are provided by the steel web reinforcements, often termed shear members. It is a simple matter to understand that if we were to build a trellis girder it would be essential in order to develop its maximum resistance that the web members should be rigidly attached to the flanges; it would not do at all to have the ties sliding upon the lower flange. In reinforced concrete, however, we often use the shear or diagonal tension members just loosely hung round the bars without any provision for resisting the tendency to slide upon these latter. Where the shear stresses are great this sliding will take place, and the beam prematurely fail. A rigid attachment of such vertical members has therefore been generally adopted from a theoretical as well as a practical aspect, and special bars have been put upon the market which provide for this rigid attachment. Messrs. Leslie and Co., however, have invented a new form of hanger, stirrup or binder, which gives such rigid attachment to ordinary commercial sections like rounds or squares. This patent hanger is shown in Figs. 1 and 2, from which it will be seen to consist of strips of flat metal or wire looped to engage the bars, tightened upon the same by means of links that are driven over to the short ends of the stirrup, which are inclined inwards, so as to wedge up tightly and clamp the bar. It is important to notice the sharp kinks in the ends of the stirrups, as these prevent the short end pulling out of the link when the binder is put into tension, and make the same tighten upon the bar as this pull upon the stirrup increases. It is more convenient, as a rule, to place such hangers or stirrups vertically, but they can be arranged at any angle. The "Leslie" linked hanger rigidly and securely clamps together the whole of the reinforcements in a beam or column, so that they cannot be put out of place by the operation of putting in the concrete within the moulds. It also has the advantage that the work can be inspected before this operation of filling in the concrete is begun. In fact, the hanger tightens up upon the main reinforcements under stress, and binds all the more closely to them, and completely resists any tendency to slip or slide along them, which means that the Leslie hanger develops great strength.

Some of the ordinary stirrups are not convenient from a practical point of view, as they cannot be kept up close against the main reinforcement, being all loose, and requiring to be pulled into place while the concrete is being rammed round them. When,

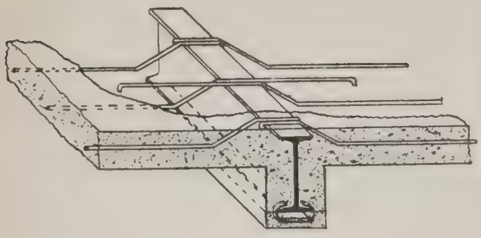


Fig. 6.—Reinforced Concrete Floor between Steel Joists.

as must be the case, the work is being executed by labourers we cannot, with even the most elaborate and careful supervision, be sure that these secondary reinforcements will keep the places for which they were designed, while the labour of putting in place and the cost of supervision are very considerable.

By employing "Leslie" linked hangers in beams, etc., the whole of the reinforcement can be assembled as a unit if desired, and dropped into place in the moulds, ready to be filled in.

From a practical point of view, as well as the point of view of theoretical efficiency, it is most desirable to have the whole of the reinforcement assembled in place and rigidly connected together, so that it can be inspected and passed by the superintending or resident engineer before being filled in. The ordinary labourer can then be left with safety to fill in the concrete without much supervision, but we must know that the reinforcement will remain in place with only a small liability of error such as is attributable to variations in workmanship. The great thing is reinforced concrete construction is to eliminate errors as much as possible, and Messrs. Leslie and Co., as contractors, thoroughly appreciate this important point.

Messrs. Leslie and Co. sometimes employ their linked hangers, or perhaps a few of them, for column reinforcements, though they often employ the type of binder shown in figure 3, from which it will be seen diagonal cross-braces are provided to perform the important function of reinforcing the core of the column. Concrete, as has been often emphasised in these pages, is comparatively weak in tension, though strong in compression. What we call shear failures are really failures by diagonal tension. The compression applied to a column is transformed into diagonal or transverse compression and tension. It is this tension which causes what is called a shear failure. If, however, we introduce reinforcements to cross the planes upon which the diagonal tension becomes excessive we make the concrete able to sustain a much greater load, and this is the function which the diagonal braces in the "Leslie" column are designed to serve. Tests on such columns have shown very great resistance, and considerable superiority over the older methods of binding longitudinal rods with simple links.

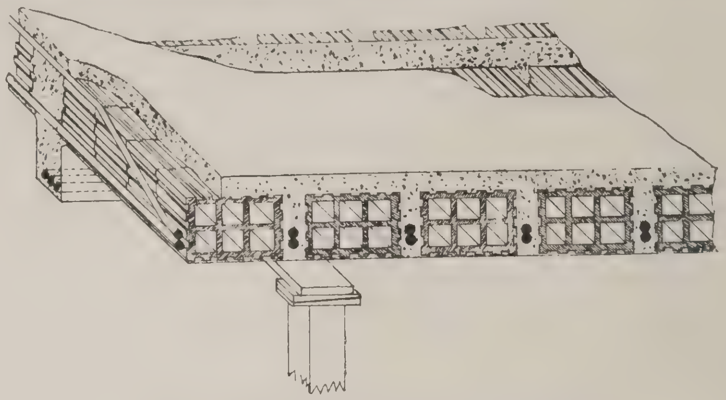


Fig. 10.—Reinforced Concrete and Hollow-brick Floor.

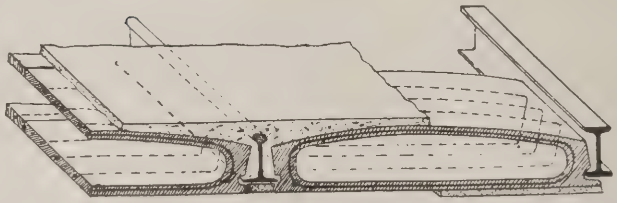


Fig. 11.—Reinforced Concrete Tubular Floor between Steel Joists. Constructed without Centering.

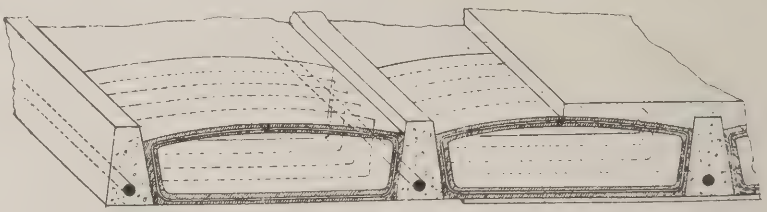


Fig. 12.—Reinforced Concrete Tubular Floor with Moulded Reinforced Concrete Ribs. Constructed without Centering.

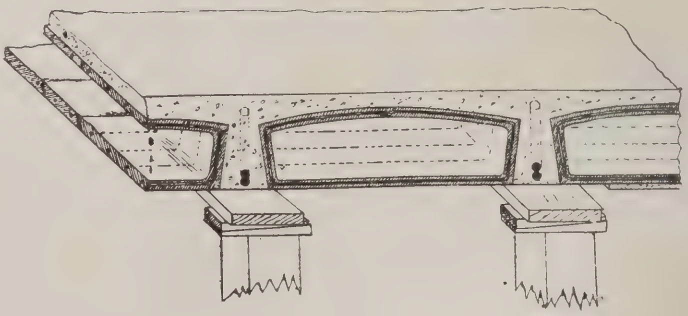


Fig. 13.—Reinforced Concrete Tubular Floor with Reinforced Concrete Beams, formed in Situ.

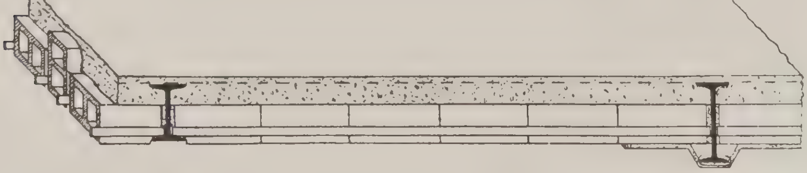


Fig. 7.—Reinforced Hollow-brick and Concrete Floor.

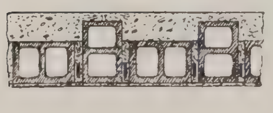


Fig. 8.—Section of Floor in Fig. 7.

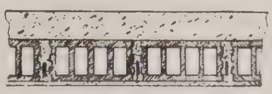


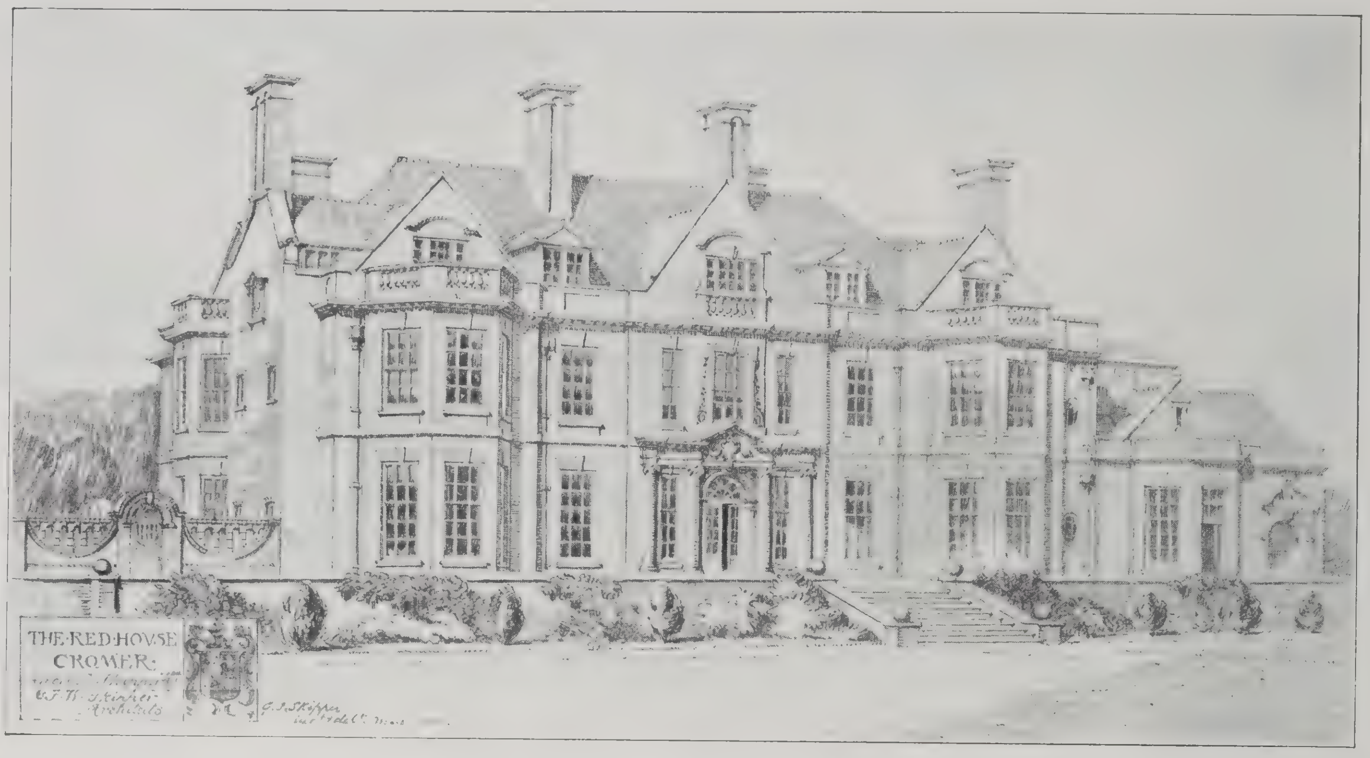
Fig. 9.—Alternative Section to Fig. 8.

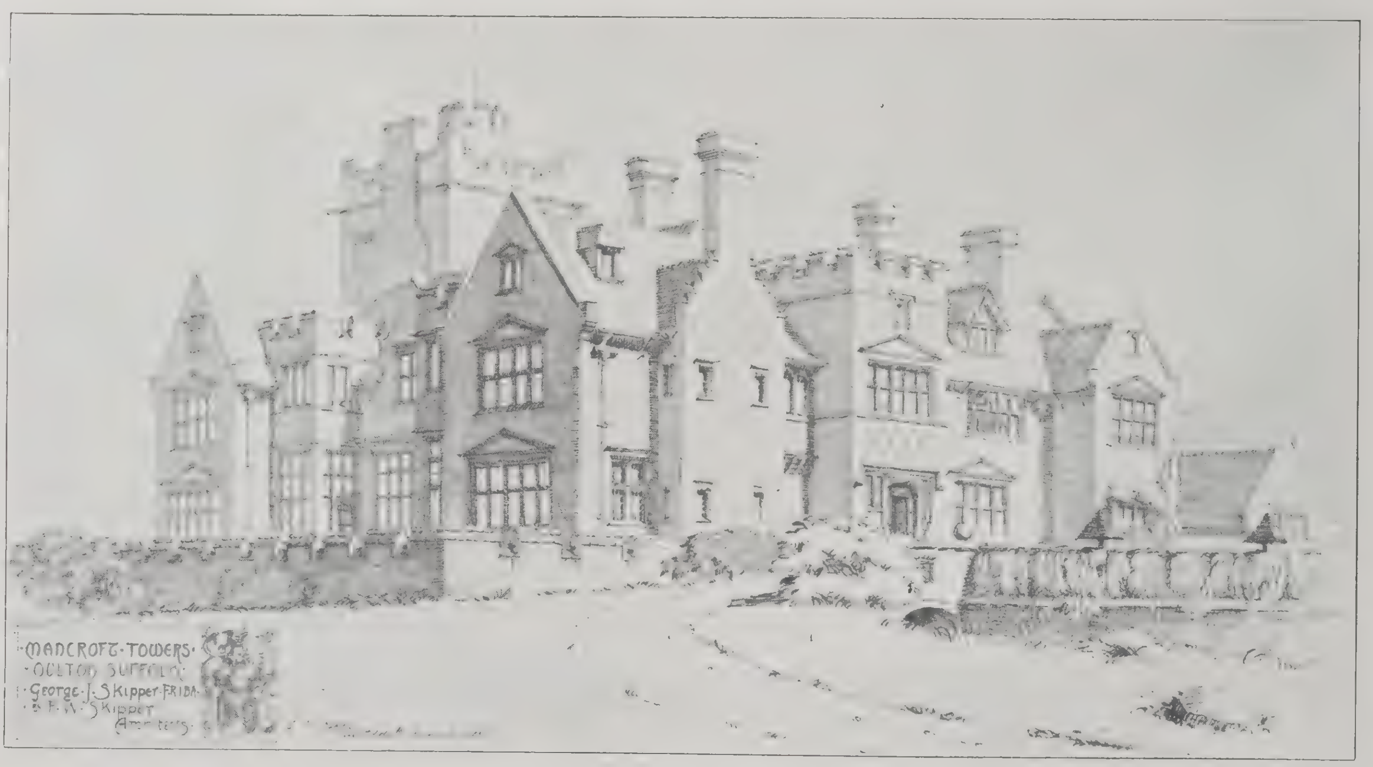
Fig. 4 is a perspective view showing the manner in which Messrs. Leslie and Co. employ their hangers to the construction of a building with beams, columns and floor-slabs.

The advantages claimed for the "Leslie" linked system are, in short—

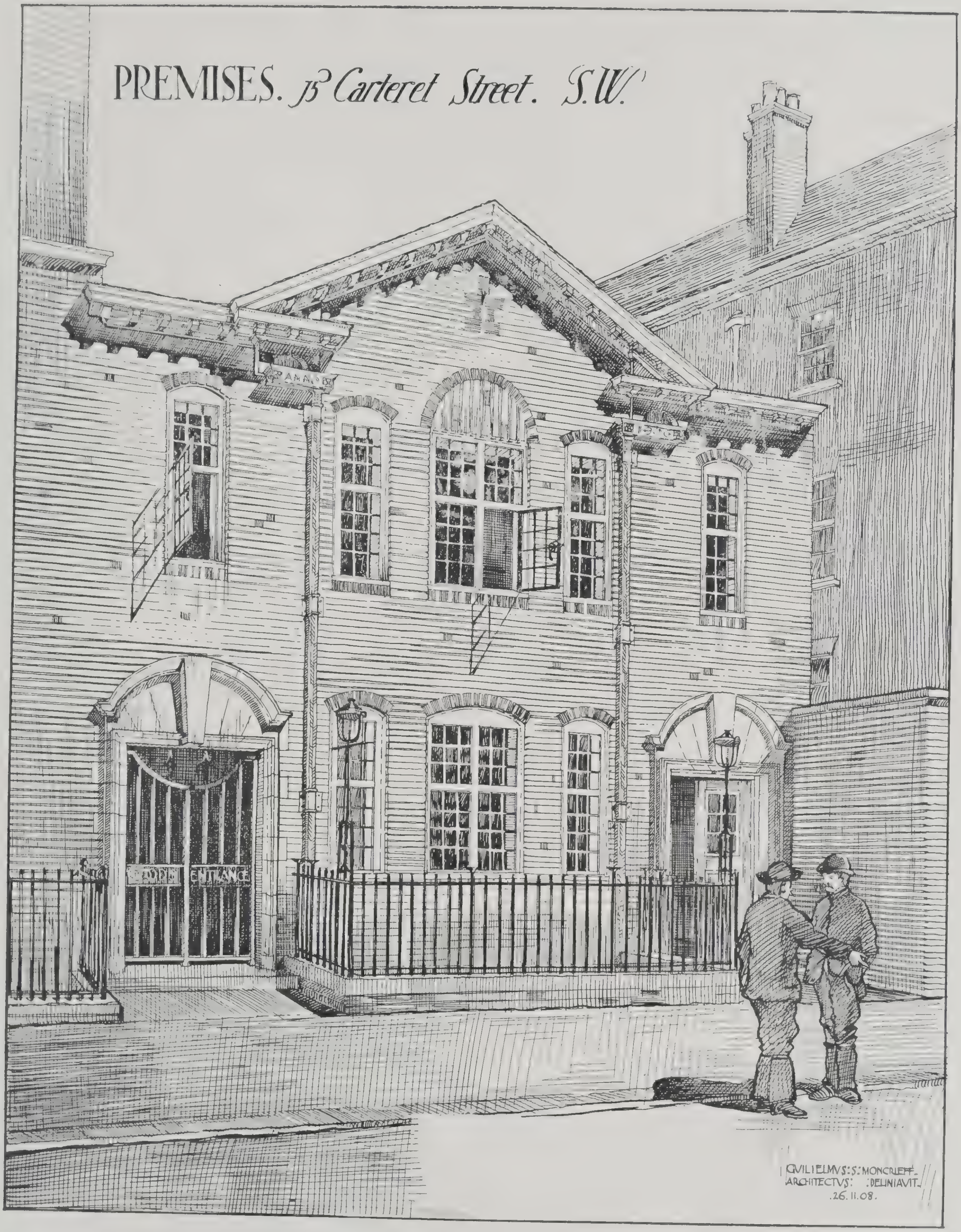
1. Rigid stirrups.
2. Stirrups any lengths and any spacing.
3. Complete truss action in beams.
4. No loose members.
5. All members completely framed as units.
6. Exactitude of disposition.
7. No risk of members being displaced.
8. Elimination of errors in workmanship.
9. Formed from ordinary standard sections of steel.
10. Fire resistance.
11. Economy of material and labour.

These claims will be appreciated by those who have studied the many systems of reinforced concrete.





G. J. & F. W. SKIPPER, ARCHITECTS.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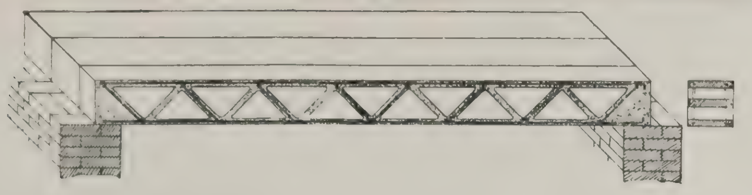


Fig. 14.—Floor of moulded Reinforced Concrete Lattice Girders constructed without Centering.

A Beamless System.

Messrs Leslie and Co. have also taken out patents for a special system of reinforced concrete construction by which wide spans of roofs or floors may be constructed with a small thickness of floor-plate, or slab, thus (1) eliminating the compartments which these beams form to obstruct the free flow of air for ventilation; (2) doing away with their obstruction to the distribution of light; (3) increasing the head-room; and (4) rendering the floor more fire-resisting.

This system is highly economical, as has been proved by competitions with other systems of construction. Not only is the appearance of the work considerably improved, but the above-mentioned claims will be readily appreciated. There is not much danger from a fire, for instance, playing upon the underside of a flat floor-slab; it is its action upon the beams which will most probably cause failure, and in this special system of Messrs. Leslie and Co. there are no beams for the fire to thus play upon. Improvement in ventilation and in lighting by the same elimination of beams is obvious, and among the incidental economies effected by the system—chief of which are the economies of centering, and the simplicity and reduction in the amount of steel—is the saving in head-room, so that, if desired, a building may be given the same head-room upon each floor as was intended to be provided with beam construction, and yet the total height of the building can be reduced by several inches at each floor level, which, in the case of a building of several storeys, would amount to some feet in total height. This saving, either estimated as cubical contents, or even as wall surface, apart from the extra load imposed otherwise upon the foundations, it will be easy to see amounts to a very considerable item.

Fireproof Floors.

Messrs. Leslie and Co. have worked out a number of designs for floors modelled upon earier types in order to meet all possible requirements in practice, and to suit every condition. With these, they offer the advantages of improvements effected by experience and study with more up-to-date knowledge, and Messrs. Leslie and Co. are prepared to guarantee efficiency, because they both design and construct the work.

Fig. 5 shows a system of constructing fireproof floors, which is more allied to the ordinary small joist and concrete floors than to pure reinforced concrete design. It is, however, often advantageous on a small job, by reason of the saving of the centering, as the centering is suspended from the main steel beams. It is sometimes also more speedy in erection. It will be seen that the system consists of hangers dropped over the beams into slots in which rods, tees, joists, or double cruciform bars are inserted. The rods and tees are the most suitable forms of reinforcement for the floor slabs between the main beams in this system of construction.

Another method that is advantageous where steel main beams are used is that shown in Fig. 6, in which it will be seen that rods are cranked up over the beams, and no hangers provided. This system is allied to that previously described and illustrated, and is even more economical of steel.

Fig. 7 shows a further system which has been designed to meet special requirements. This consists of a hollow brick floor reinforced with flat or round bars inserted between the bricks, which are laid with cement mortar and concrete filling applied at the top to provide sufficient compressive resistance, the steel taking the tensile stresses below.

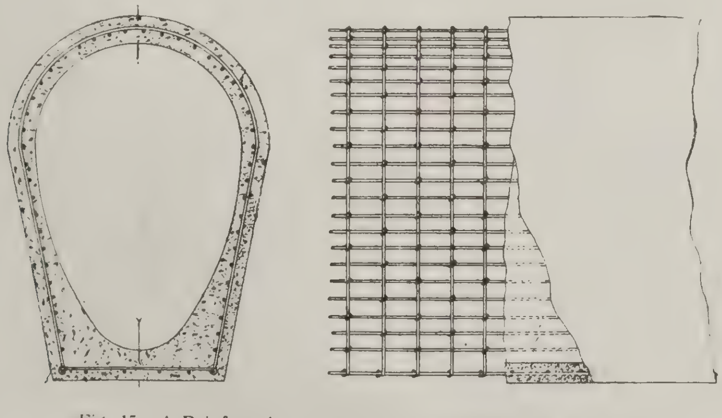


Fig 15.—A Reinforced Concrete Sewer of Egg-shaped Section.

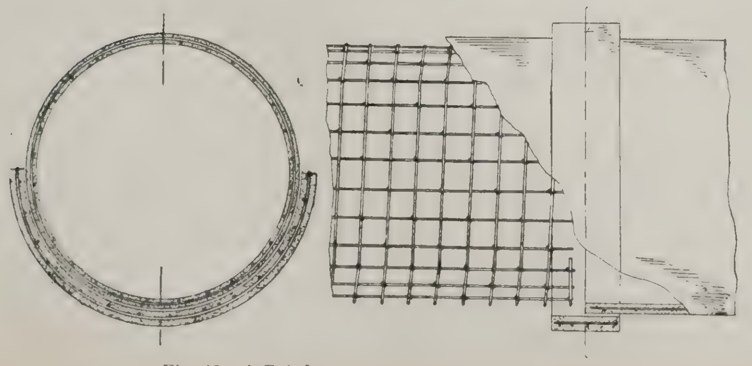


Fig. 16.—A Reinforced Concrete Pipe or Main.

Alternative sections of these hollow brick or terra-cotta floors are shown in Figs. 8 and 9, together with their concrete filling, and it will be seen from these that the floor practically consists of a series of T beams, with the bricks forming filling pieces in the nature of ceiling slabs. Such floors are sound resisting, and can be rapidly constructed. They are economical for steel frame structures.

Fig. 10 shows an extension of the system for complete reinforced structures where a heavier floor load is imposed, and a level ceiling is desired, and also where sound resistance is of importance. The main beams are of reinforced concrete, and the floor slab between becomes virtually a T-beam construction, the hollow brick or terra-cotta blocks serving simply the purpose of a ceiling slab. It will be seen from this view how the centering necessarily used in construction is economised, for boards are only needed to receive the edges of the blocks, and to retain the concrete filling.

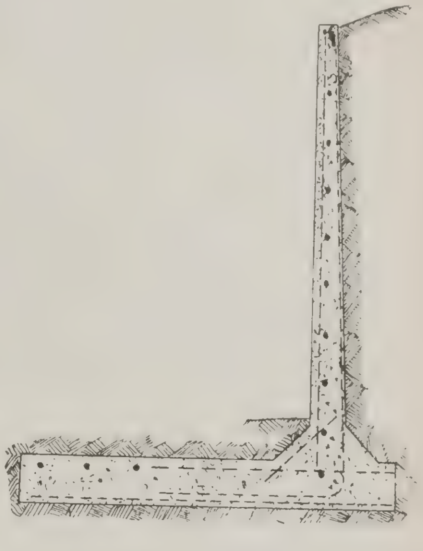


Fig. 17.—Section of a Reinforced Concrete Retaining Wall.

Figs. 11, 12 and 13 show other types of hollow floors in which reinforced concrete tubes are used, so as to secure a level ceiling, and render the floor more sound-proof than a solid floor.

Fig. 11 shows a type where the tubes are filled between rolled steel joists or bulb tees spaced at 3ft. or 4ft. centres. A bulb tee section is preferable to a joist, because the upper flange of the steel is only needed temporarily while it has to serve the function of a permanent centering. When the concrete filling has set it provides the compressive resistance needed.

Fig. 12 shows the manner in which similar tubes are used with reinforced concrete joists or ribs moulded in the shop. These moulded ribs of reinforced concrete can be conveniently made of any span up to 30ft., and as no centering is required, the system is extremely rapid in construction, and can thus be economically employed. The modification of the system (Fig. 13), in which the ribs are cast *in situ*, the only centering being a board placed as shown just to support the ends of the tubes, has its advantages in the way of economy in certain circumstances.

Fig. 14 shows another type of floor, which consists of a series of rectangular open lattice girders of reinforced concrete placed side by side. These can be easily made in the shop, and a stock kept ready for delivery to job, so as to expedite the work of construction. The floor being hollow, is sound-resisting, and a level ceiling is obtained below.

The foregoing are the general types of reinforced concrete floor construction which are adopted, but there are numerous modifications to suit special conditions. As a rule, every job has some peculiarity.

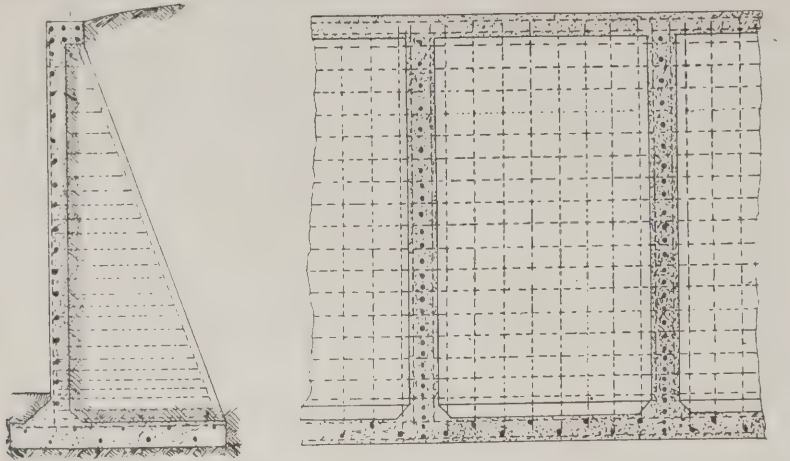


Fig. 18.—Cross and longitudinal Sections of a Reinforced Concrete Retaining Wall.

Pipes and Sewers.

Fig. 15 illustrates Leslie's method of reinforcing an egg-shaped concrete sewer which can be constructed *in situ*. The reinforcement consists of longitudinal bars wired to others of horseshoe shape, the latter being turned at the ends to suspend another meshwork of rods. In constructing this type of sewer, the economy of which is obvious by comparison with the ordinary egg-shaped sewer in brick, a sheet of metal centering is used, which can be reduced in diameter, withdrawn and re-erected easily.

Fig. 16 shows a reinforced concrete pipe or main suitable for conveying water, sewage or other liquids. This is not designed to be constructed *in situ*, but can be made in moulds placed at the sides of the trenches, and moved from stage to stage of the work, thus saving transport. Such pipes can be designed to resist great pressure, and are not only much cheaper than cast-iron pipes, both in first cost and in maintenance, but are often 50 per cent. or more less in weight than cast-iron pipes capable of resisting the same pressure. This is attributable to the fact that cast-iron is not a material strong in tension, and is also difficult to cast in circular form, whereas the spiral slab reinforcement, such as is provided to resist the hoop tension, consisting of mild steel rods, is so much stronger than cast-iron.

Retaining Walls.

Figs. 17 and 18 show two Leslie types of retaining wall, the economy of which is very great compared with the ordinary mass concrete or brickwork retaining wall. Fig. 17 shows a method by which a toe and a heel are provided, the latter extending away from the retained earth. Fig. 18 shows another type in which the toe extends for some considerable distance under the earth, and the portion projecting on the opposite side is very small. The weight of the earth itself bearing upon the toe prevents the structure overturning; buttresses are provided at points.

Messrs. Leslie and Co. also construct walls, steps, piles, bridges, piers and jetties, water-towers, etc., in all kinds of reinforced concrete. The firm also undertakes the construction of hollow or cavity plain or reinforced concrete, and brick wall construction, interlocking concrete block or slab partitions, artificial stone of every description, and structural steelwork and fire-resisting construction generally.

They issue a catalogue which deals generally with the subject of reinforced concrete, which will be found extremely valuable by anyone studying the subject. This catalogue also contains a useful standard specification, to be used as a basis for tendering.

Members of the National Federation of Master Builders deeply sympathise with Mr. James Storrs, J.P., of Stalybridge, a member of the Administrative Council (Northern Centre), whose brother, Mr. George Henry Storrs, was brutally murdered at his residence in Dukinfield last week. Mr. G. H. Storrs was a builder and contractor and millowner. It is supposed that his assailant has committed suicide.

THEORETICAL AND EXPERIMENTAL RESEARCHES.

(The figures in this article are Italian Weights and measurements. An Italian ton equal 2237.7lbs. English.)

(Concluded from page 289, *No.* 766.)

Beam III. The crack due to the tensile stresses and the diagonal cracks were noticed approximately under the same circumstances as in Beam I. The cracking is, however, expedited as the mechanical bonds of the steel separate from the concrete rather than adhere to it, so that the bars soon lose their adhesion to the mass (Fig. 15).

Beam IV. The steel bars are bent where the diminution of the bending moment permits. The force of adhesion of the single straight bar at the working load of 11.5 tons is calculated at 21.1 kg per cm2; it is, however, much higher. If the tensile force supported by the bent bars is calculated, we obtain a tension of $\sigma f = 1{,}000$ kg/cm2. At a load of 9 tons, when the first cracks due to the tension of the concrete appear, the adhesive stress amounts to 17.4 kg/cm2, a value which never appeared in the first three tests; and this is a further proof that the diagonal cracks are not due to the want of adhesive resistance between the steel and concrete. At a load of 33 tons, diagonal cracks are noticed, at which value $\sigma f = 53.5$ kg/cm2. At this value it seemed that the adhesive resistance was overcome, which lessened the resistance of the straight bar, and the nearer bent bar

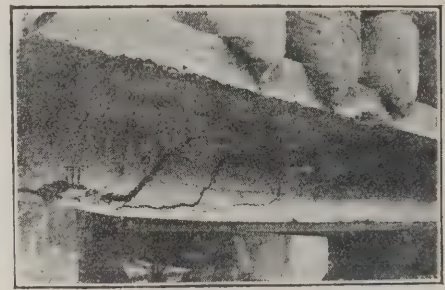


Fig. 15.—View of Beam III. test.

was found to have the most strain; this fact caused a separation of the concrete where the bar was bent, and hence the rupture. As a result, therefore, we see the necessity of securely fastening the straight bar, and also of the angle of the bent bars not being too sharp.

Beam VI. This is constructed in the same manner as No. IV., with the difference that the straight bar is not bent squarely at the end; it was, therefore, possible to observe the beginning of the slipping of the steel in the concrete. Besides, the stirrups are placed all the way along, and the intermediate bent bar is not brought up to the supports. The tensile cracks and the oblique cracks were noticed sooner than in Beam IV.—they were seen at a load of 19 tons, at which load the straight bar began to slip longitudinally.

The adhesion stress amounted then to 32.5 per kg/cm in accordance with direct tests. Rupture resulted at a load of 37.8 tons, as a result of the separation of the concrete close to the nearer corner. A comparison between Beams IV. and VI. shows that when the bending of the bar is done properly, the stirrups have no influence; but the square crook at the end of the straight bar is of great importance, as was shown by the lessened resistance of Beam IV. due to its absence. The destruction of the straight bar and the consequent increase of the load on the bent bar was noticed much sooner.

Beam V. The bars in this beam are placed as in ordinary reinforced beams, and the cracks were noticed exactly as in Beams I., II., and III. This shows that this system of reinforcement for evenly distributed loads without the straight bar stirrups does not resist the diagonal cracks. Beam V. car-

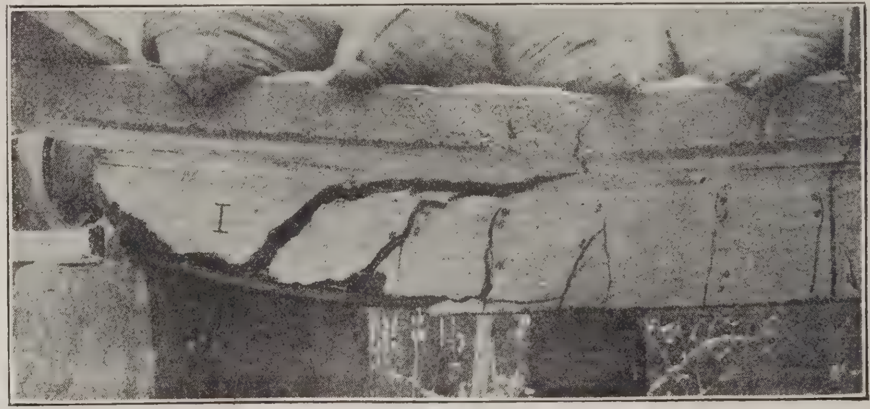


Fig. 14.—View of Beam I. test.

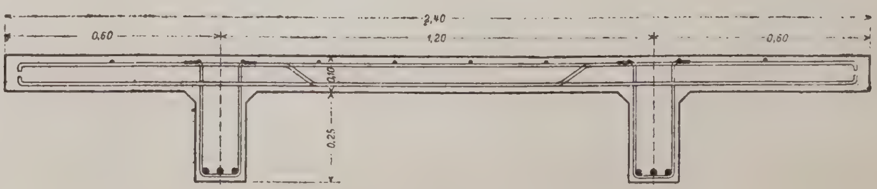
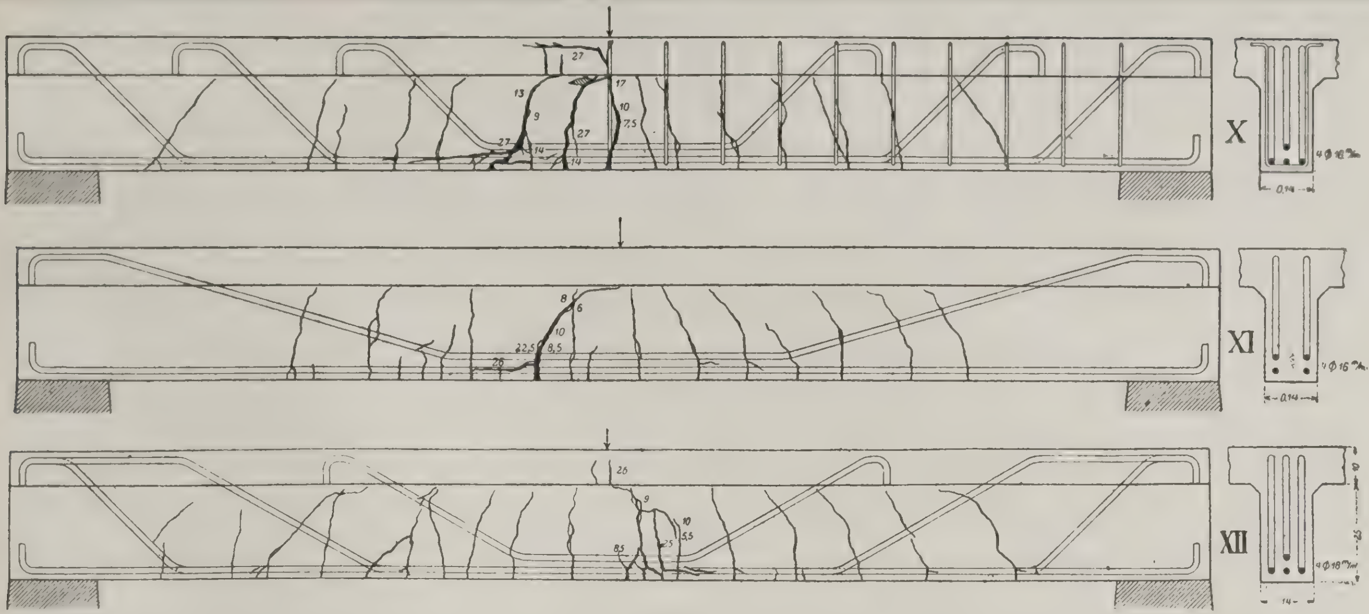


Fig. 13.—Arrangement of Beam.



Figs. 10, 11, and 12. Beams with Loads concentrated in the Centre.

ried more than I. and III., and less than IV. and VI. The superiority of the other method of placing the reinforcing bars is clearly shown.

Group 1. Load Concentrated at Two Points.

Beam VII. This beam differs from IV. and V., inasmuch as the iron bars are bent up uniformly at three points, so as to keep the transverse forces constant, and corresponding with the lineal diminution of the bending moment. At a working load of $2P=9$ tons $\sigma f=1{,}010$ to $1{,}040$ kg/cm2 is obtained in the lower part, and in the corners. Except for the tensile cracks, which were first noticed in the middle, and which got bigger as the load increased, no other separation was noticed, and also the straight bars did not slip, notwithstanding the fact that at the moment of cracking the adhesive stress had reached 63 kg/cm^2. This high value is to be attributed to the stirrups which prevented the separation of the concrete.

Beam VIII. This beam has a narrow rib of 10 cm. If we suppose that the beam is constructed like an ordinary reinforced beam composed of a plain beam and of a complete reinforced beam, and that each of these elements bears half of the load, the supposition, if exact, ought to be confirmed in this case when the reinforcement keeps its equilibrium under the disposition of load which is adopted. Besides the tensile cracks at a load of 9.8 tons, a crack which is almost horizontal was observed above the curved bars, where τ_0 is calculated at 9.7 kg/cm2 (Fig. 16). Admitting that only half of the transverse force acts, and the other held is supported by the curved bars, $\tau_0=4.8$ kg/cm2 is obtained, and the crack would be sufficiently explained. At a load of 14 tons, the crack continued in a diagonal direction; at this point $\tau_0=14.2$ kg/cm2. It thus seems that the first crack was caused by the action of the transverse force; as a result, the action of the reinforcement made itself felt, so that the diagonal crack was only caused by the half of the transverse force, which corresponds to the value $\tau_0=7.1$ kg/cm^2. A comparison with the deflection of the ordinary plain reinforced beams confirms this result. In such beams the deflection resulting from the strain on the steel is much greater with the complete reinforcement than in the plain beam, so that the two elements do not act together at the beginning, but only after a certain load.

Beam IX. This differs from Beam VIII. by having a greater thickness of rib. The cracks formed in exactly the same manner; but these only appeared after a greater load had been applied (Fig. 17). The half which was furnished with stirrups kept in better condition, from which it is to be gathered that the presence of the stirrups in the beams at points where the steel is placed in ordinary beams is of great importance to the resistance of the beam, while in beams where the steel is placed as in IV. and VI., good results are obtained without stirrups. The question if, and in what measure, the ordinary reinforcing with stirrups is superior to that of IV. and VI. without stirrups, must be found out by new special tests.

Group 3. Load Concentrated in the Middle.

With these three beams, the action of the transverse force was secondary; these beams were broken in the middle. At the increase of the load only tensile cracks were formed, and the two half beams, with and without stirrups, acted in the same way. Rupture was caused by the opening of a middle crack and by the crushing of the concrete on the outside. According to calculation the tensile strain was then 4,050 kg per sp. cm; in reality, however, it was only 3,880 kg/cm2, because the compressed area, while being calculated as 7 centimetres, was only 2 centimetres high. The compression strain on the outside surface amounted to 262 kg/cm2, while the resistance to the crushing, measured on a cubic inch of material, amounted to 182 kg/cm2.

Beam XI. This acted exactly in the same way as Beam X. Beam XII. differed from Beam X. by the fact that both the middle bars were bent up at 30 degs. or 45 degs. Otherwise it acted in exactly the same way. This third group did not give any new interesting indications of the forces of shear, and of adhesion between steel and concrete, but it is worthy of notice on account of the tension at rupture which was observed in the steel, which exceeded the elastic limit. The large size of the compressed flange offers con-

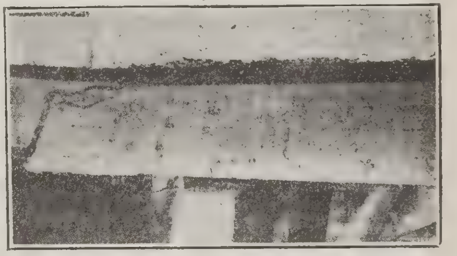


Fig. 17. View of test on Beam 9.

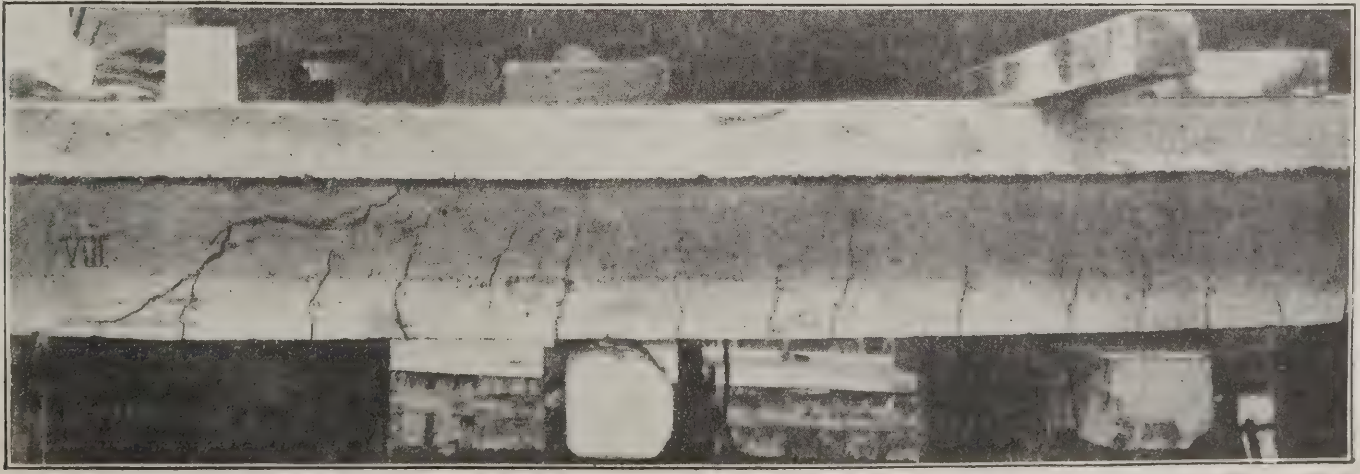


Fig. 16. View of test on Beam 8.

siderable resistance to the increased pressure on the extremities resulting from the lengthening of the bars.

Professor Morsch draws the following conclusions from his experiments:—The tests show that, besides the sectional area, the disposition of the reinforcement is a great safeguard against rupture. Reinforced concrete should not be studied solely for its own properties as a material for construction, but the formation of beams should be studied as constructive elements. The adhesion between the component materials cannot be determined by means of trial cubes or prisms, but only on beams which have to bear bending stresses if practical results are to be obtained.

It is particularly laid down that the disposal of the steel bars without reinforcing stirrups is very defective. From a practical point of view, the determination of the most favourable reinforcement is of greater importance than to determine the stresses due to limited loads, as this determination is not a practical guide for judging their safety against rupture.

Even if these tests do not clearly point out the necessity for the strengthening stirrups when the reinforcement is arranged rationally, yet their use is to be recommended, as they ensure a good union between the ribs and the flange, and strengthen the neutral part of the beam against bending strains.

The minute cracks which are produced at the commencement of the loading are of importance, when the calculation only takes into account the resistance of the concrete to tension; these cracks do not present any danger of rusting of the steel, because this is sufficiently protected by the skin of cement which surrounds it.

The theory of the extensibility of the concrete was not established by the tests.

SOME CAUSES OF FAULTY CONCRETE CONSTRUCTION.

Expansion or Contraction.

A common occurrence in the failure of concrete work caused by faulty aggregate, and in which the cement had been hurriedly and ignorantly asserted to be the cause of failure, is where a clay ballast or brick-rubbish aggregate is used, which contains an excess of sulphate of calcium or similar harmful ingredients.

Experiments to illustrate such an instance of concrete failure due to the aggregates employed have been arranged, with the following results. In the case of a large bulk of concrete composed of six of aggregate to one of cement, a well burnt and clean clay ballast was used with furnace cinders and sand in the proportions of three parts, two, and one respectively.

The concrete bulk after some weeks hardening commenced to expand and disintegrate and, as usual, the quality of the cement was first suspected. After a very thorough investigation, however, into the quality of the cement this alleged cause was abandoned, as the produce was found to be sound in every way. Then an inquiry into the separate aggregates took place, and sample blocks were prepared as follows and kept under supervision, viz.:—

A. Cement and furnace cinders (3+1)
B. Cement and sand ... ... (3+1)
C. Cement and ballast ... ... (3+1)

And after some ten days' exposure to the atmosphere it was found that block "C" disintegrated in the same way that the bulk concrete had expanded and fallen to pieces. The two sample blocks of the same cement when separately mixed with the sand and cinders forming the other portions of the aggregate were perfectly sound in every way. An enquiry was then made into the quality of the brick rubbish or ballast used as the main aggregate, with the result that it was found that an average sample contained sulphate and sulphite of calcium equal to 9.51 per cent., and the concrete bulk expansion must be attributed to expansion caused by those substances. In explanation of this result it might be added that the sulphate is contained in the original clay probably as pyrites, and upon burning the clay for ballast the sulphate becomes a sulphite. But in the concrete the oxygen contained in the atmosphere enters into combination with the sulphite, and forms a sulphate again, and in so doing expands and distintegrates the concrete.

Old Plaster Cement.

Great care is necessary in dealing with old concrete floors where plaster of Paris was the matrice. An instance has occurred where old concrete made 40 years since was broken up and re-used with Portland cement as a matrice, the result of which was the concrete expanded, and a failure was the result. It was necessary to raise an old floor of plaster concrete, and of the same age, 2 ins. This was done with Portland cement concrete, which, after the lapse of some time, heaved up in various places, and examination showed that it was the old plaster concrete that had swollen through contact with the water in the cement. This goes to prove that expansion of plaster of Paris used as a matrice in concrete takes place when water is applied many years after.

Change of Temperature.

It is often discovered that monolithic concrete walls after erection frequently disclose ugly cracks, almost amounting in some cases to fissures, and although no great diminution in strength is supposed to result, these cracks militate much in its disfavour. This has always been an objectionable feature to contend with in concrete.

These are caused through the natural phenomena of expansion and contraction with change of temperature. This change of form has been put down to a peculiarity of concrete which other wall and paving substances are not liable to. But this is a mistake, for it is simply the materials of which the concrete is made that expand and contract, and their conversion into concrete in no wise affects this property of contraction and expansion. True, there is none, or but little, palpable evidence of change of form in brick or stone walls, or brick or stone paving, but there is no mistaking it in concrete walls, or concrete paving. The reason is that the change is distributed so evenly throughout the multitudinous mortar joints of brick and stone work that it is imperceptible; brick walls built with cement will often show cracks here and there, usually put down to settlement, but which, in reality, are more often the result of contraction and expansion: if these cracks are watched it will be found that they close in mild weather and open again when the temperature falls. Mortar-built walls never show the effects of contraction and expansion, while cement-built walls frequently do, because mortar made with lime will withstand a certain amount of compression, while cement is practically unyielding, and, when set, incompressible.

The use of an unyielding material like Portland cement in jointing long lengths of coping or ridge tiles will cause the same thing. Massive brick piers at the end of a long wall, and against which the stone coping abuts, have been pushed more than an inch from the perpendicular, and ridge tiles lifted completely off their bed and broken from the same cause. According to experts, the linear expansion by heat from 32 degrees to 212 degrees of granite is one part in 1,267, of ordinary brick one part in 1,818, and of firebrick one part in 2,365, or ⅛in. in 24ft., and this ratio would apply to concrete walls or concrete paving where the aggregates were of a similar nature, and pro rata to the amount of variation of temperature they were subject to.

It has been usual to charge the matrice with the cause of expansion and contraction in concrete walls, but the quantity used is so small, if seasoned it is so little subject to change of form, and is so evenly distributed, that it perhaps has next to nothing to do with the result, and this is proved by the fact that good cement concrete, no matter whether used for walling, or paving, or other purposes, is unaffected in this way until a considerable change of temperature takes place.

Concrete Floors.

To save the bulging of walls in floor concrete construction, it is best to insert wood expansion strips round all floors before commencing, as was the practice when plaster of Paris was the matrice, and to remove them when the concrete is set, filling in the cavities with sand, and calling the attention of the architect or clerk of works to what had been done, and with what motive. The cost is trifling, and any future trouble need not then interest the floor contractor.

(*To be continued.*)

Federation News.

LONDON MASTER BUILDERS' ASSOCIATION.

Secretary: T. Costigan.

A special Council meeting of the London Master Builders' Association was held at 31 and 32, Bedford Street, Strand, W.C., on Thursday, November 4th, the president (Mr. F. G. Rice) in the chair.

The meeting was largely attended, and much interest was displayed in the various subjects submitted for consideration.

The proofs of the pamphlet about to be issued were considered, and instructions were given as to their circulation. A question arose as to the radii observed by the London County Council and the London Master Builders' Association; twenty miles from Charing Cross being adopted by the former body as its limit, while the latter body had a radius of twelve miles from the same centre as set out in the working rule agreements with the different trade societies. Eventually the Council decided to adhere to its own limitations, and to limit its operations to the twelve-mile radius.

A very interesting discussion on the work of the Organisation Committee took place, in which Mr. F. Higgs (chairman of that committee), Mr. C. Bird Godson, Mr. Frank May, Mr. W. Lawrence, jun., Mr. John Garrett, Mr. Ernest J. Brown, and Mr. H. W. Horner took part.

Mr. G. Bird Godson referred to the question of tendering without quantities being supplied, and to the hardship imposed on builders by having to take out their own quantities. He suggested that the matter be ventilated by deputations from the London Master Builders' Association to wait upon the Royal Institute of British Architects and other professional bodies concerned.

Mr. Ernest J. Brown gave the views of the National Federation, and said it was a matter which every effort would be made to remedy.

The Council fully sympathised with Mr. Godson's views, and determined to ask the Royal Institute of British Architects and other bodies to receive a deputation.

The resolutions passed at the conference with the Quantity Surveyors' Association, on October 13th last, had been sent to the members of the Council, and it was resolved to send the following to each member of the association. The discussion on it was entered into by Mr. Ernest J. Brown, Mr. Frank May, Mr. W. F. Wallis, and others, and it was resolved: "That the conference disapproves of the practice of asking for tenders in competition for works of a substantial value without quantities, prepared by a fully qualified quantity surveyor, being supplied, and is of opinion that such quantities should be supplied in all cases when competitive estimates are invited for works expected to cost £500 and upwards."

A letter advocating the preferential employment of registered plumbers was read, and the views entertained and expressed upon much the same subject by the Institute of Builders were given. The Council was of opinion that the persons engaged should be judged by their practical, and not by paper, qualifications.

Messrs. D. Burkle and Son, of 34, Osnaburgh Street, N.W., were elected a member of the association, on the nomination of Messrs. H. C. Cleaver, Ltd., seconded by Mr. G. Bird Godson.

Yorkshire Federation.

The monthly meeting of the Executive Council was held at the George Hotel, Selby, on Thursday, October 21st. Mr. W. R. Thompson (President) occupied the chair, and was supported by 41 delegates from the federated associations.

Mr. Mark Scott, the chairman of the Selby Urban District Council, was present, and offered a civic welcome to the members. On the motion of the President, seconded by Councillor W. G. England, J.P., the best thanks of the Federation were tendered to Mr. Mark Scott for the kind reception he had extended to the Federation, and for the esteemed references he made to the local members, which were highly valued.

The minutes of last meeting were read and approved. Apologies for absence were reported from the Right Hon. The Lord Mayor of York (Ald. J. Birch), Councillor G. Mansfield, J.P. (York), Alderman W. H. Jessop, J.P., Councillors J. W. Mallinson and J. Dawson (Huddersfield); Mr. H. Fallas (Wakefield), and Mr. J. Biggin (Sheffield).

The President reported that Mr. H. Fallas, of Horbury, had sustained a heavy loss in the death of his wife since the last meeting of the Federation. A resolution of sympathy and condolence had already been forwarded and a letter of reply from Mr. Fallas was read.

The President called attention to the serious illness of Alderman W. H. Jessop, J.P., and reported that although still confined to his room, he was making steady progress towards recovery. It was resolved, on the motion of the President, seconded by Mr. A. J. Forsdike, to express to Alderman W. H. Jessop, J.P., the deep regret with which the members had heard of his serious illness.

The treasurer reported receipt during the month of £32 10s. towards the National Reserve Fund, and of £30 16s. for subscriptions. The Finance Committee reported that they had examined the account in connection with the Conference of Secretaries, and, on the motion of Mr. W. T. Ledgard, seconded by Mr. A. J. Forsdike, the account was approved and payment ordered.

The treasurer called attention to the fact that, notwithstanding the receipt of £32 10s. on account of the National Reserve Fund during the month, he still required a sum of £94 13s. 10d. to stand clear on this account at the end of the financial year. If the local associations who had made definite promises in 1906 paid the half of such amount, he estimated he would be able to meet the payment. He therefore earnestly appealed that these associations would do their utmost to support the Federation, and to honourably and loyally co-operate with the other associations who, under trying circumstances, had faithfully carried out their promise. The treasurer further pointed out that he had, for the current year, only an excess of income over expenditure of about £54; and that several sums of considerable amount would fall due for payment next month. The members would therefore realise the paramount necessity of strenuous efforts being made by every local association in order that the liabilities of the Federation should be promptly discharged, and their financial prestige worthily maintained.

The President reported that the Finance and Emergency Committee had under consideration the question of proper storage of the various books and documents belonging to the Federation, and recommended that some arrangement should be entered into by the Federation, the Leeds Master Builders' Association, and the secretary, for increased accommodation. On the motion of the President, seconded by Mr. J. Townsley, the question of office accommodation was referred to the Finance and Emergency Committee for consideration and report.

A form of sub-contract, submitted by Mr. W. H. Hope, solicitor, of Sunderland, together with covering letter, was considered. It was resolved, on the motion of Councillor W. G. England, J.P., seconded by Mr. W. T. Ledgard, to request the local associations to take the draft into careful consideration, and to favour the Federation with their approval, or any suggested amendments, not later than November 11th.

A report was presented as to the present position of the case at Dewsbury arising out of the unwillingness of a local architect to waive the clause in the contract by which he was appointed sole arbitrator. The matter is still *sub judice*, on account of the difficulty in arranging for a meeting of the trustees.

Letters were read as to the custom in connection with final certificates, and reports given as follows:—The custom in London is for the architect, after seeing his client with the accounts, and getting him to sign same, to issue the final certificate to the builder.

The Secretaries of the Lancashire, Cheshire and North Wales, Northern Counties, and Midland Federations stated that the general practice in their districts is to issue the final certificate to the contractor. It was further pointed out that Clause 30 of the National Form of Contract provides, with respect to instalments, that:—"The contractor shall be entitled under the certificates to be issued by the architect to the contractor," etc.

With respect to the completion of works and payment of retention money, Clause 30 further provided:—"The contractor shall be entitled, under the certificate to be issued by the architect, to receive payment of," etc. "The architect shall issue his certificates in accordance with this clause."

Several members called attention to the absolute necessity of every member loyally cooperating in reminding architects of the standard custom in this matter, and respectfully asking their strict and kind conformity thereto. Several instances were given of the serious inconvenience and unnecessary loss caused to contractors arising out of undue delay in issuing the final certificate.

Attention was called to the recent decision of the Court of Appeal in William Kennedy, Ltd., v. Mayor and Corporation of Barrow-in-Furness, of which particulars were given last week.

A letter was read from the National Federation with respect to the formation of the Local Joint Committees for hearing and settling disputes provided in the revised agreement with the plasterers. In towns where there is a master plasterers' association it was recommended that the master builders' association and the master plasterers' association should mutually agree as to the proportion of representatives for the employers' section, and request the operative plasterers to appoint an equal number. In towns where there is no separate master pasterers' association, and an operative plasterers' branch has been formed, the master builders' association were recommended to appoint the employers' representatives if the master plasterers were members of the master builders' association. Local associations were asked to give the matter urgent attention, in order that the local committees may be formally constituted at the earliest possible date.

The President reported that the National Conference of Secretaries had been held at Leeds on Tuesday, October 19th, and that the attendance showed an increase on last year. Several interesting papers were read, and evoked considerable discussion. He urged members to read the reports in the "Builders' Journal," as they would find subjects not only of interest to Secretaries, but also of considerable trade importance. On the motion of the president, seconded by Mr. W. T. Ledgard, it was resolved to convene a conference of Yorkshire Secretaries at the conclusion of the next meeting of the Federation, and earnestly to urge upon the secretaries of all Federated associations the expediency of making arrangements to ensure their presence on that occasion. The President reported that a meeting of the Northern Centre had been held at Leeds on October 18th, at which it was decided not to submit any proposals this year for amendment of Conciliation Board rules.

The Chairman reported that a meeting of the National Administrative Committee had been held on October 12th, when it was reported that representatives of the National and other Employers' Federations had been favoured with an interview by Sir H. L. Smith, the Permanent Secretary of the Board of Trade, with respect to the suggested rules for the Labour Exchanges.

It was reported that a meeting of the Northern Centre Conciliation Board had been held at Leeds on October 11th to consider an appeal from the Liverpool Local Conciliation Board with reference to the interpretation of the joiners' rule for extra payment for insulation work on cold storage work. The matter was thoroughly discussed, but the employers' representatives could not accept the operatives' interpretation of the rule, and as the opinions were so divergent, it had not been found possible to arrive at a decision.

The Chairman reported that a meeting of building trade employers had recently been held at Skipton, and that the attendance was satisfactory. A resolution was unanimously passed to form a local association for Skipton and district, and a committee was appointed to prepare draft rules and submit same to a further meeting.

A letter was read from the Leeds Association asking the consent of the Federation to notices being given to the masons, bricklayers, and labourers, for alteration of winter working hours, to avoid a stoppage for breakfast, and for a counter-notice being given within fourteen days by the party receiving notice for alteration of rules. On the motion of Mr. A. J. Forsdike, seconded by Councillor W. G. England, J.P., the Federation gave their consent to the Leeds Association giving notice in accordance with their request.

Mr. Clements, of Featherstone, called the attention of the Federation to the difficulty and expense he was experiencing in connection with an accident which occurred to a workman at a time when his risks were not covered by insurance. The accident occurred in May, 1907, and at the time it was thought that the only injury was a fracture to the collar-bone. Subsequently the workman was troubled with a chest complaint, which the doctor stated was consequent upon the accident. The case had been before the court on two or three occasions, and as there was considerable conflict in the opinions of the medical witnesses, the judge had ordered the continuance of payment of half wages. Mr. Clements was requested to send full particulars to the Federation Secretary. Attention was called to the grave financial risk which an employer ran by not being fully insured, and members were urged to give this matter prompt attention as renewal became due.

The arrangements for next meeting were left in the hands of the president and secretary.

The members, under the guidance of Mr. Ullathorne and the clerk of works, inspected the work in restoration of Selby Abbey, and were afterwards entertained to tea by the President and members of the Selby Association. The vicar of Selby expressed the pleasure he had in being present, and of being given an opportunity of testifying to the lasting work in connection with the restoration of Selby Abbey, which had been faithfully and skilfully carried out by a local contractor.

J. Davidson, Secretary,
14, Park Row, Leeds.

Messrs. Archibald, Smith and Stevens, of Janus Works, Queen's Road, Battersea, have for family reasons converted their business into a Limited Company, under the title of Smith, Major and Stevens, Ltd. No shares have been offered to the public, and the previous owners, Messrs. C. G. Major, E. C. Stevens, and P. H. Stevens, together with Mr. P. C. Major, become directors, with Mr. C. G. Major as chairman.

COMPLETE LIST OF CONTRACTS OPEN.

In this list are included, as a rule, only those contracts for which tenders are returnable about five days after the date of this issue.

Unless expressly stated to the contrary, all deposits required for bills of quantities, etc., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the Contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Nov. 10. **LEEDS.**—Contractors desirous to tender for the erection of billiard-room to the North-West Liberal Club, are requested to send their names by above date to J. W. Thackray, M.R.S.I., Architect, 4, Greek Street, Leeds.

Nov. 10. **NORTHFLEET, KENT.**—Erection of a new department to accommodate 400 boys at Dover Road Council School, Northfleet, Kent, for the Education Committee. Plans and specification, prepared by the Committee's Architect, Wilfrid H. Robinson, M.S.A., may be inspected at the office of the Committee from Nov. 10, until the time appointed for the delivery of tenders. Persons desiring to tender and receive copy of bills of quantities must send names, accompanied by a deposit of £1, by noon to-day, to Fras. W. Crook, Secretary, Caxton House, Westminster, S.W. Tenders, endorsed "Northfleet Tender," to be sent to F. Mitchell, 49, Windmill Street, Gravesend, Kent.

Nov 13. **WINCHESTER.**—Builders desirous of tendering for the erection of a new high school boarding house at Winchester, are requested to send their names, not later than above date, to Colson and Nisbett, Architects, 45, Jewry Street, Winchester, where plans and specification may be seen and quantities obtained.

Nov. 15. **CAERPHILLY.**—Building three houses, etc., on site of Old Parrot Inn. Plans and specifications may be seen at the office of C. M. Davies, 112, High Street, Merthyr, until Nov. 15, when tenders are to be delivered to D. Williams and Co., T.V., Brewery, Merthyr.

Nov. 15. **SKELMANTHORPE.**—Erection of a lodge and entrance gates, Commercial Road, Skelmanthorpe. Plans may be seen and bills of quantities obtained of J. Berry, Architect and Surveyor, 3, Market Place, Huddersfield, to whom tenders are to be sent.

Nov. 15. **MERTON, S.W.**—Erection of a block of five cottages and a block of eight cottages, in Mill Road, Merton Abbey Estate, High Street, Merton, S.W. Plans and specifications (no quantities) can be seen with Henry R. G. S. Smallman, A.R.I.B.A., 8, Queen Street, Cheapside, E.C., to whom tenders are to be sent.

Nov. 15. **BURY (Lancs.).**—Building vaults (single and double) required at the cemetery during next twelve months, for the Corporation. Drawings may be seen and specifications and forms of tender obtained upon application at the Borough Engineer's Office, Bank Street, Bury. Sealed tenders, endorsed "Vaults," to be forwarded to the Town Clerk, Bury.

Nov. 15. **LIVERPOOL.**—Execution of bricklayers' work required in the construction of area walls and keeper's quarters, at new chief offices for the Royal Liver Friendly Society, Liverpool. Plans and specification and copy of the bill of quantities (on deposit of £1), at the office of W. Aubrey Thomas, Architect, 14, Dale Street, Liverpool. Tenders, endorsed "Tender for Royal Liver Buildings, Area Walls, etc.," to be addressed to the Secretary, Royal Liver Friendly Society, Prescot Street, Liverpool.

Nov. 15. **CARRICKMORE (Ireland).**—Erection of stationmasters' houses at Carrickmore, Keady, and Creaghanroe, and also a cottage, about ¾ of a mile from Castlewellan Station, for the Great Northern Railway Company (Ireland). Plans and specifications at the office of W. H. Mills, Engineer-in-Chief, Amiens Street Terminus, Dublin, or copies at the office of the District Engineer, Belfast, and can obtain at the said offices forms of tender on payment of 1s. each (not returnable). Tenders should be delivered to T. Morrison, Secretary, Secretary's Office, Amiens Street Terminus, Dublin.

Nov. 16. **GARNDIFFAITH (near Pontypool).**—Extensions and alterations to be carried out at the Bethel Primitive Methodist Chapel, Garndiffaith, for the Trustees. Plans and specifications may be seen at the offices of A. Gordon Babbidge, Architect and Surveyor, Clarence Chambers, Pontypool. Tenders to be sent to the Secretary, A. D. Williams, 37, Percy Street, Garndiffaith.

Nov. 16. **BETHNAL GREEN.**—Repairs to the Relief Hall of their Administrative Offices, Bishop's Road, Victoria Park, N.E. (nearest station, Cambridge Heath, G.E.R.), for the Board of Guardians. Forms of tender and specification of the work may be obtained on deposit of £2 2s., of D. Thomas, Clerk to the Board, Guardians' Administrative Offices, Bishop's Road, Victoria Park, N.E.

Nov. 16. **BARNBY MOOR (near Retford).**—Persons desirous of tendering for the whole of the various trades required in the erection of a new house at Barnby Moor, near Retford, for J. T. Spencer, are requested to send their names to G. A. Wilson, Architect, Hartshead Chambers, Sheffield, on or before above date, when bills of quantities will be sent.

Nov. 16. **ACTON.**—Execution of (a) erection of a 30-bed ward pavilion at the Isolation Hospital, Wales Farm Road, Acton, W.; (b) making-up and paving passages, Valetta Road, Acton, W.; for the U.D.C. Plans and specifications may be seen, and bill of quantities and forms of tender obtained, on application to D. J. Ebbetts, Surveyor, 57, High Street, Acton. Tenders, sealed and endorsed "Hospital Pavilion" or "Valetta Road Passages," must be delivered to Wm. Hodson, Clerk to the Council, Council Offices, 242, High Street, Acton, W.

Nov. 16. **LEEDS.**—Execution of the whole of the work required in the alterations, etc., of the Queen's Lodging House, East Street, Leeds, and in the alterations of houses into houses and shops, Beeston Road, Leeds, for the Corporation. Specification and plan can be seen, and bills of quantities obtained for the latter on and after Nov. 8, from W. T. Lancashire, City Engineer, Municipal Buildings, Leeds. Tenders, properly endorsed, must be received at the Town Clerk's Office, Town Hall, Leeds.

Nov. 16. **TOTTENHAM.**—Erection of a permanent school to accommodate 1,420 children, on the Crowland Road site, for the Education Committee. Applications for quantities to be made to the Architect, G. E. T. Laurence, A.R.I.B.A., 22, Buckingham Street, Adelphi, W.C., where plans and specification may be seen. Quantities will be supplied on deposit of £2 2s. Persons tendering will be required to deposit with W. Mallinson, Clerk to the Committee, Education Offices, Philip Lane, South Tottenham, N., when handing in their tender, in Bank of England notes or cash, the sum of £10. Fair wages clause.

Nov. 16. **DURHAM.**—Erection of new Council school at Haswell, and removal of iron school from Harlow Green to Easington Colliery, for the County Council. Plans, specifications, and general conditions of contract may be seen, and bills of quantities obtained, as follows:—(1) for Haswell school (810 scholars), at the office of W. Rushworth, Shire Hall, Durham; (2) for removal of iron school at Harlow Green to Easington Colliery (plans, specification, and general conditions only), at the office of F E. Coates, Shire Hall, Durham. Sealed tenders (endorsed with name of school) are to be sent to A. J. Dawson, Clerk to the Education Committee, Shire Hall, Durham.

Nov. 17. **BURY.**—Construction of about 50 yards of stone and brick and concrete culverts, 3ft. 10ins. by 6ft. 8ins., at Goodlad Street and Walshaw Road, for the Corporation. Drawings may be seen and specifications, bills of quantities, together with forms of tender, obtained upon application to Arthur W. Bradley, Assoc.M.Inst.C.E., Borough Engineer and Surveyor, Bank Street, Bury. Tenders to be delivered to the Town Clerk, Bury.

Nov. 17. **LONDON.**—Extension of the Branch Post Office and Sorting Office, Notting Hill, for the Commissioners of H.M. Works and Public Buildings. Drawings, specification, and a copy of the conditions and form of contract, may be seen on application to J. Wager, A.R.I.B.A., H.M. Office of Works, Carlisle Place, S.W. Bills of quantities and forms of tender may be obtained at Storey's Gate on deposit of £1 1s. Tenders must be delivered to the Secretary, H.M. Office of Works, etc., Storey's Gate, London, S.W.

Nov. 17. **FERMOY.**—Erection of six labourers' dwellings, at Wolfe Tone Park, Fermoy, together with the construction of footpaths, fences, etc., also laying sewerage and water supply in connection therewith, according to plans and specification prepared by D. J. Buckley, C.E., M.R.I.A.I., Cork, which may be examined and copied at the office of the Urban Council, or of the Architect. Forms of tender may be obtained from the Clerk or the Engineer. Sealed tenders, endorsed "Labourers' Dwellings," will be received by P. J. Lane, Town Clerk of Fermoy, Council Chamber, Courthouse, Fermoy. £20 deposit must accompany each tender. Contractor will be liable under the Workmen's Compensation Acts, or the Employers' Liability Acts.

Nov. 17. **LONDON, S.W.**—Construction of a store building and other contingent works, on land situate at the Battersea Works of the Board, London, S.W., for the Metropolitan Water Board. The drawings, conditions of contract, and specification may be inspected at the offices of the Chief Engineer, Savoy Court, Strand, W.C. Contractors desirous of tendering may obtain forms of tender, conditions of contract, specification, list of drawings, and bills of quantities, from the Chief Engineer, on the production of an official receipt for the sum of £10, which sum must be deposited with the Accountant, at Savoy Court, Strand, W.C. Tenders, enclosed in sealed envelopes, must be addressed to the Clerk, Metropolitan Water Board, Savoy Court, Strand, W.C.

Nov. 18. **LOUGHBOROUGH.**—Alterations at the Hicking's School, Ashby Road, for the Education Committee. Plans may be seen and schedule of quantities obtained upon deposit of £1 1s., with Barrowcliff and Allcock, Architects, Town Hall Chambers.

Nov. 18. **LIVERPOOL.**—Pointing, etc., the buildings of the administrative block and the nurses' home at the Infirmary, for the West Derby Union. Specification may be seen at the office of the Steward, on the premises. Tenders to be sent to Harris P. Cleaver, Union Clerk, Union Offices, Brougham Terrace, West Derby Road, Liverpool.

Nov. 18. **HULL.**—Erection of a school in Sidmouth Street, for the Corporation. Drawings and specification may be seen with Joseph H. Hirst, City Architect, Town Hall, Hull, and quantities obtained upon deposit of £2 2s. Remittances to be made payable to the City Treasurer. Tenders are to be addressed to the Secretary of Education, and delivered at the Education Offices, Hull.

Nov. 18. **LEEDS.**—Additions and alterations to the Divisional Police Station, Millgarth Street, for the Corporation. Plans and specifications may be seen, and bills of quantities, together with the general conditions of contract and forms of tender, obtained, at the offices of the Architect, Archibald Neill, F.R.I.B.A., 38, Park Row. A deposit of £1 1s. will be required. Tenders must be delivered at the Town Clerk's Office.

Nov. 18. **BLACKBURN.**—Erection of the new Council School, Bangor Street, Blackburn, for the Corporation. Forms of tender and bills of quantities may be obtained from the Architects, Cooper and Slater, 13, Richmond Terrace, Blackburn, on deposit of £1 1s. Contractors are requested to send in their names to the Architects immediately. Tenders for the whole of the work, endorsed "New Council School, Bangor Street," to be delivered to Lewis Beard, Town Hall, Blackburn.

Nov. 19. **ALMONDBURY.**—Various works required in the erection of a schoolroom, etc., for the Trustees of Zion Chapel. Quantities may be obtained, and drawings and specification inspected at the office of Norman Culley, A.R.I.B.A., Architect, 13, John William Street, Huddersfield, to whom tenders are to be sent.

Nov. 19. **WAKEFIELD.**—Whole or separate tenders for the following works:—Laughton-en-le-Morthen New School, Wickersley New School (builder, joiner, plasterer, slater, plumber, painter), for the West Riding Education Committee. Plans may be seen and specifications with quantities obtained on application to the West Riding Architect, County Hall, Wakefield. A deposit of £1 in each case must be sent by separate letter to the West Riding Treasurer, County Hall, Wakefield. Sealed tenders, properly endorsed, must be sent to Francis Alvey Darwin, Clerk of the County Council, County Hall, Wakefield.

Nov. 20. **PLYMOUTH.**—Erection of stabling for about 30 horses, in Plymouth. Plans and specifications can be inspected on application to Truscott and Sons, Octagon Mews, Plymouth, to whom sealed tenders should be delivered.

Nov. 20. **WORKINGTON.**—Execution of the several works required in the erection of an extension to the meter-house at the Stainburn reservoir, for the Corporation. Plans and specification may be seen at the office of H. B. Williams, Borough Engineer and Surveyor, Town Hall, Workington, to whom tenders are to be sent.

Nov. 20. **WILLINGDON, ETC. (Essex).**—Execution of the following works for the East Sussex Education Committee:—1, Erection of a new school and master's house at Willingdon; 2, erection of a new school and master's house at Broad Oak, Heathfield; 3, alterations to the girls' and infants' school, South Road, Newhaven. Names and addresses to F. J. Wood, County Surveyor, County Hall, Lewes, from whom full particulars can be obtained.

(Continued on page xxiii.)

Nov. 20. **BURY ST. EDMUND'S.**—Provision of a cookery room, assembly hall, and alterations to the county school and P.T. Centre, Bury St. Edmund's, for the W. Suffolk Education Committee. Specification and form of tender may be obtained on application to the Building Inspector, A. Ainsworth Hunt, Shire Hall, Bury St. Edmund's. Sealed tenders, addressed to Fred. R. Hughes, Secretary to the Education Committee, Shire Hall, Bury St. Edmund s, are to be delivered at the County Education Offices, endorsed "County School and P.T. Centre."

Nov. 22. **ABERTILLERY.**—Construction of a large swimming bath, boiler house, and other buildings for the Committee of the Powell's Tillery Workmen's Institute, Abertillery. Plans may be seen with the Secretary, C. W. Spalding, Powell's Tillery Institute, Abertillery, or with W. Beddoe Rees, Architect, 3, Dumfries Place, Cardiff. Tenders are to be delivered to the Secretary.

Nov. 22. **STANLEY (Co. Durham).**—Erection of new offices, in Front Street, Stanley, for the U.D.C. Bills of quantities and forms of tender may be obtained from, and plans and specifications seen, at the office of the Clerk, or the Architect for the work, John W. Wilson, No. 3, Coleshill Street, Sutton Coldfield, Warwick, on deposit of £2 2s. Tenders must be sent to John Geo. Ridley, Clerk to the Council, Stanley, R.S.O., Co. Durham.

Nov. 22. **PONTYMISTER (Mon.).**—Erection of 34 houses at Pontymister, for the Risca U.D.C. Plans may be seen and a copy of the specifications obtained upon application to A. J. Dardis, Council Offices, Risca, Mon., Engineer to the Council, on deposit of £2 2s. Tenders must be sent to T. S. Edwards, Clerk, 24, Stow Hill, Newport, Mon. The person whose tender is accepted will be required to enter into a contract and bond with two approved sureties in £1,000. Fair wages clause.

Nov. 22. **WICK.**—Execution of mason, carpenter and joiner, slater, plumber, and plaster work, in connection with erection of proposed U.F. Manse at Wick, for the Deacons' Court. Persons desirous of tendering may obtain copies of schedules and conditions of contract on application to Wm. Sutherland, Ashley House, Wick. Drawings may also be seen there. Tenders must be returned to Gardner and Miller, Architects, 144, St. Vincent Street, Glasgow.

Nov. 23. **PLYMOUTH.**—Supply, delivery, and fixing of No. 4 ornamental shelters in the pleasure grounds, for the Corporation. Tenders, accompanied by designs, detail drawings, and specifications, are invited for carrying out this work, must be delivered to James Paton, Borough Engineer and Surveyor, Municipal Offices, Plymouth.

Nov. 23. **LONDON.**—Extension of the Royal Courts of Justice, for the Commissioners of H.M. Works and Public Buildings. Drawings, specification, and a copy of the conditions and form of contract, may be seen on application to Sir Henry Tanner, I.S.O., F.R.I.B.A., H.M. Office of Works, etc. Bills of quantities and forms of tender may be obtained at Storey's Gate, on deposit of £1 1s. Tenders must be delivered to the Secretary, H.M. Office of Works, etc., Storey's Gate, London, S.W.

Nov. 23. **PONTYPRIDD.**—Designs and tenders for the erection of iron buildings on a site in Court House Street, Pontypridd, for the Union. A block plan of the site and of the size of the suggested buildings, together with a short description, may be seen not later than above date, with Wm. Spickett, Clerk, Union Offices, Pontypridd, to whom tenders are to be sent. Designs and tenders must be endorsed "Iron Buildings," and delivered to me at my office not later thon 10 a.m. on Wednesday, the 1st day of December.

Nov. 24. **INVERNESS.**—Execution of mason and carpenter work, for the Corporation. Plans may be seen and specifications, schedule of quantities, and form of tender obtained at the office of the Burgh Surveyor. Offers, marked "Tramway Scheme Contract No. 2," will be received by the Burgh Surveyor.

Nov. 24. **RHONDDA VALLEY.**—Erection of 28 houses at Tynycae, Penygraig, Rhondda Valley, for the Tynycae Building Club. Names and addresses should be sent to W. M. Lewis and T. Naunton Morgan, Architects and Surveyors, Tonypandy and Pontypridd. Tenders are to be sent to the Secretary of the Club, A. J. Williams, Old Bank Chambers, Pontypridd.

Nov. 24.—**HOMERTON, N.E.**—Demolition of cottages, Nos. 35 to 50 (inclusive), Crozier Terrace, High Street, Homerton, N.E., and the erection of boundary walls, for the Hackney Union. Specifications, conditions of contract, and forms of tender can be obtained of the Clerk, and drawings may be seen at the Guardians' Office, Sidney Road, Homerton. Tenders must be delivered to Frank R. Coles, Clerk to the Guardians. Sureties required.

Nov. 24. **MOGERHANGER.**—Erection of a new Council school at Mogerhanger, for the Bedfordshire C.C. Drawings, specifications, and form of contract may be inspected at the County Surveyor's Office, Shire Hall, Bedford. Builders desirous of tendering must send their names and addresses to the Architect, H. Leete, Monthermer, Huntingdon, by Nov. 14, together with a deposit of £1 1s. Tenders must be sent to W. W. Marks, Clerk of the County Council, Shire Hall, Bedford

Nov. 24. **ALDEBURGH.**—Removal of the upper portion of the existing brick water tower at Aldeburgh, including the roof, cast-iron tank holding 11,000 gallons, girders and internal fittings, and the construction of a new steel tank to contain 35,000 gallons upon steel columns and joists fixed inside the tower, and re-building the walls of the tower to a greater height, together with the necessary connections to the mains, staircases, etc., for the Corporation. Drawings may be seen and copies of the specification, bills of quantities, etc., obtained at the office of the Borough Surveyor, J. C. Gordon, Aldeburgh, or at the offices of the Engineers, J. Mansergh and Sons, 5, Victoria Street, Westminster, on deposit of £2 2s. Tenders to be delivered to Henry C. Casley, Town Clerk, Aldeburgh.

Nov. 25. **RAINHILL, LANCS.**—Erection of six cottages at the Asylum, for the Lancashire Asylums Board. Drawings may be inspected, and all information obtained at the Engineer's Office. Bills of quantities can be obtained on application to the Clerk, on deposit of £2 2s. (cash). Tenders to be delivered to Jas. Gornall, Clerk and Steward, Clerk's Office, Rainhill Asylum.

Nov. 29. **KIRTON-IN-HOLLAND (Lincs.).**—Persons desirous of tendering for alterations and enlargement of the Kirton Marsh Council School, are requested to send in their names to the Architect, Jas. Rowell, Church Lane, Boston, on or before Nov. 6. Copy of the plans and specification can be obtained from the Architect, on loan, on deposit of £2. Tenders, sealed and endorsed "Tender for Enlargement of School," to be sent to J. H. Tooley, Clerk to the Managers, 6, Bridge Street, Boston.

Nov. 30. **ERDINGTON.**—Erection of the following buldings, for the U.D.C.:—Public lavatories, Orphanage Road; public lavatories, Woodend Road; tramways waiting rooms and lavatories at Chester Road; open-air swimming baths, boathouse, landing stage, etc., small bridge spanning stream, and shelters, at the new Reservoir Park. Drawings and specifications may be seen and copies of bills of quantities, form of tender, and all information obtained upon application to Herbert H. Humphries, Engineer and Surveyor, The Council House, Erdington, to whom tenders sealed and endorsed, must be delivered. Contractors will be required to deposit £5 with the Council's Accountant Clerk. Fair wages clause.

No date. **CORK.**—Extension and alterations to 44, King Street, for R. B. Baker, Cycle Agent. Particulars may be obtained from Hugh W. Flanagin, B.E., B.A., Architect, 2, South Mall.

No date. **BROUGHTON-IN-FURNESS.**—Whole of the work (except joiner's) in making alterations and additions to Moss Cottage, Foxfield, Broughton-in-Furness. Bills of quantities may be obtained from J. S. Phizacklea, Architect, Windermere.

No date. **CLOUGHBAWN, CO. WEXFORD (Ireland).**—Reconstruction of the roof of the Catholic Church, Cloughbawn, Clonroche, Co. Wexford, for the Very Rev. Father Cloney, P.P., according to the plans and specification prepared by Ashlin and Coleman, Architects, 7, Dawson Street, Dublin. Bills of quantities may be had on application to the Surveyors, Morris and Co., 68, Harcourt Street, Dublin. Plans may be seen at the Presbytery, and at the Architect's Offices.

No date. **STRATHPEFFER.**—Execution of the mason and brick, iron, carpenter, plumber, asphalte, slater, plasterer, painter, glazier, and other works of hotel proposed to be erected at Strathpeffer, for the Highland Railway Company. Contractors desirous of tendering are requested to lodge their names with Cameron and Burnett, Architects and Surveyors, Academy Buildings Inverness, for scheduel of quantities and all other information.

ENGINEERING.

Nov. 17. **ECCLES.**—Supply and fixing of the heating apparatus required at school now in course of erection, for the Corporation. Drawings may be inspected and further particulars obtained at the office of the Architect, Henry Lord, 42, Deansgate, Manchester, and a copy of the conditions, specification, and form of tender may be obtained from Edwin Parkes, Town Clerk, Town Hall, Eccles, on deposit of 10s. Tenders to be delivered at the Town Clerk's Office, Town Hall, Eccles.

Nov. 19. **MANCHESTER.**—Providing and laying a 10in. diameter rising main from the pumping station at Clayton Vale to the Stuart Street generating station, for the Corporation. Forms of tender and bills of quantities may be obtained on application to F. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester, on deposit of £2 2s. Drawings, etc., may be inspected at the offices of the Engineers, C. S. Allott and Son, 46, Brown Street, Manchester. Tenders addressed to the Chairman of the Electricity Committee, must be delivered at the Town Hall.

Nov. 20. **CORK.**—Supplying steam rolling plant, for the County Council. Particulars with conditions and requirements can be obtained on application to E. Callanan, Secretary, Cork County Council, Court House, Cork, to whom tenders are to be sent.

Nov. 20. **MANCHESTER.**—Supplying and fixing at their Whitworth Street West pumping station one vertical steam-driven cross compound air compressor, with surface condenser, coolers, air receiver, pipes, valves, etc., for the Corporation. Specification, conditions of contract, form of tender, and general arrangement plan may be obtained on application to the Secretary, Waterworks Offices, Town Hall, Manchester, on deposit of £2 2s. Tenders to be delivered to Wm. Henry Talbot, Town Clerk, Town Hall, Manchester.

Nov. 23. **EDINBURGH.**—Execution of electrical installation at M'Leod Street Police Station, for the Corporation. Specification, plans of the building, and form of tender, can be obtained at the office of Frank A. Newington, Engineer, Electricity Supply Station, Dewar Place, Edinburgh, on deposit of £1 1s. Tenders must be sent to the Town Clerk, City Chambers, Edinburgh.

Nov. 24. **LENHAM (Kent).**—Improvement of the heating apparatus required to be carried out at school for the Kent Education Committee. Specifications can be seen, and further information obtained at the offices of the Correspondent, F. Day, Lenham, to whom tenders are to be sent.

Nov. 24. **INVERNESS.**—Supplying and laying about 1,667 yards of permanent way between the Gas Works and the Refuse Tip, situated on the Citadel Farm Lands, together with all points, crossings, loops, causewaying, and other relative works, for the Town Council. Plans may be seen and specification, schedules of quantities, and form of tender, obtained, at the office of T. H. Scott, C.E., Burgh Surveyor, on deposit of £1 1s. Offers marked "Tramway Scheme, Contract No. 1," will be received by the Burgh Surveyor.

Dec. 7. **LONDON.**—Works to be executed in constructing by the compressed-air process and maintaining for 12 calendar months from the date of completion, a footway tunnel under the River Thames between Woolwich and North Woolwich, with shafts and staircases thereto, for the L.C.C. Persons desiring to submit tenders may obtain the drawings, specifications, bills of quantities, form of tender, and other particulars, on application to the Chief Engineer of the Council, Maurice Fitzmaurice, C.M.G., at the County Hall, Spring Gardens, S.W., upon deposit with the Cashier of the Council of £5. Full particulars of the work may be obtained on application at the County Hall, before the payment of the fee for the specification, etc. Tenders must be delivered at the County Hall, in a sealed cover, addressed to the Clerk of the London County Councl, Spring Gardens, S.W. Fair wages clause.

IRON AND STEEL.

Nov. 15. **EPSOM.**—Supply and delivery of about 1,400 yards of 3in. cast-iron water main in 9ft. lengths and about 12 specials, for the U.D.C. Particulars and forms of tender may be obtained from William Young, Manager, Water Works, East Street, Epsom. Tenders must be sent to E. G. Wilson, Clerk, Church Street, Epsom.

Nov. 15. **FINCHLEY.**—Supply, delivery, and erection in the Regent's Park Road of about 780 yards run of 4ft. 6ins. unclimbable wrought-iron fencing, for the U.D.C. Drawing and specification may be seen, and form of tender obtained, on application to the Council's Engineer and Surveyor. Sealed tenders, endorsed "Tender for Fencing," to be delivered to E. H. Lister, Clerk of the Council, Council Offices, Church End, Finchley, N.

Nov. 15. **LLANELLY.**—Supply and delivery of approximately 970 tons of cast-iron pipes and specials from 24in. to 3in. in diameter, delivered in Llanelly, for the U.D.C. Copy of general conditions, specification, bill of quantities, form of tender may be obtained on application to Geo. Watkeys, Engineer, Town Hall, Llanelly, on deposit of £5 5s. Tenders to be delivered at the office of Henry W. Spowart, Clerk, Town Hall, Llanelly.

Nov. 16. **FILEY.**—Supply of about 4,400 yards of 8in. cast-iron water mains, etc., for the U.D.C. Specification may be inspected at the offices of the Council, Filey, or a copy will be forwarded by Henry Tobey, Engineer, Malton, Yorkshire, on receipt of 4s. 6d. (not returnable). Endorsed tenders to be delivered at the Council Chambers, Filey.

Nov. 20. **SWANSEA.**—Supply of iron, castings, chains, timber, oils, ironmongery, shipchandlery, and general stores, for 12 months, from Jan. 1, 1910, for the Swansea Harbour Trust. Forms of tenders and full particulars may be obtained on application to the Engineer, at the Harbour Offices, Swansea.

Nov. 22. **BIRKDALE.**—Supply of about 50 tons of 24in. cast-iron pipes, 210 tons of 15in. cast-iron pipes, 90 tons of 12in. cast-iron pipes, 272 tons of 9in. cast-iron pipes, 5 tons of 6in. cast-iron pipes, together with special castings, for the U.D.C. Specifications, bills of quantities, and form of tender, can be obtained at the offices of the Engineers, Willcox and Raikes, 63, Temple Row, Birmingham, on deposit of £3 3s. Tenders, in envelopes supplied, marked "Contract No. 4," to be delivered to J. F. Keeley, Clerk to the Urban District Council, Town Hall, Birkdale.

Nov. 23. **LONDON.**—Supply of about 200 tons of steel bridge girders and other iron and steel work of British manufacture, for the Great Western Railway. Plans and specification may be seen and forms of tender and bills of quantities obtained at the office of the Engineer at Paddington Station. Tenders must be sent to G. K. Mills, Secretary, Paddington Station, London.

(Continued on next page.)

Nov. 26. **ERDINGTON.**—Provision and erection of unclimbable wrought-iron fencing and gates, at the Goosemoor Lane Allotments and the New Reservoir Park, for the U.D.C. Copies of specification, quantities, and forms of tender may be obtained upon application to Herbert H. Humphries, Engineer and Surveyor, Council House, Erdington, to whom tenders are to be sent. Fair wages clause.

Dec. 7. **SHANKLIN I.W.**—Supply and delivery at Newport, Isle of Wight, of about 15,300 lineal yards of 9in. cast-iron pipes, 900 yards of 4in., and 855 yards of 3in. cast-iron pipes, and connections in accordance with the schedule of quantities, for the U.D.C. Also supply and delivery of 12in. and 10in. cast-iron pipes and connections as required. Specification, conditions, and form of tender may be obtained from the Engineer, Ernest Charles Cooper, on deposit of £3 3s. Sealed tenders to be sent to John Marsh, Clerk to the Council, The Council Chambers, Shanklin Sureties required.

PAINTING.

Nov. 15. **HALIFAX.**—Painting and colouring Akroyd Place and Parkinson Lane Council Schools and colouring the dining rooms at Queen's Road and Sunnyside Council Schools, for the Corporation. Plans and specifications may be seen and forms of tender obtained on application to James Lord, M.I.C.E., Borough Engineer, Town Hall, Halifax, upon deposit of £1. Tenders, endorsed "Painting of Schools," must be sent to W. H. Ostler, Secretary, 22, Union Street, Halifax. Fair wages clause.

Nov. 17. **MANCHESTER.**—Painting, etc., at the offices in New Bridge Street, Manchester, for the Guardians. Specifications may be obtained at the office of A. J. Murgatroyd, Architect, 23, Strutt Street, Manchester, upon deposit of 10s. 6d. Tenders to be delivered to James Macdonald, Clerk to the Guardians, Poor Law Offices, New Bridge Street, Manchester.

Nov. 18. **LIVERPOOL.**—Painting at the lower hospitals of the Infirmary, for the West Derby Union. Specifications to be seen at the office of the Steward, on the premises. Tenders to be sent to Harris P. Cleaver, Union Clerk, Union Offices, Brougham Terrace, West Derby Road. Liverpool.

Nov. 23. **LEEDS.**—Painting the interior and exterior of the public baths at Union Street Holbeck, and Kirkstall Road, for the Corporation. Specification may be seen, and forms of tender obtained of W. T. Lancashire, City Engineer, Municipal Buildings. Tenders must be delivered at the Town Clerk's Office.

PLUMBING AND SANITARY

Nov. 15. **NORMANTON.**—Execution of a scheme of sewage disposal, comprising the construction of screening and detritus chambers, continuous bacterial and sand filters, extension of precipitation tanks, storm water tanks, sewers, etc., for the U.D.C. Full particulars may be obtained upon application to the joint engineers, D. Balfour and Son, Civil Engineers, 3, St. Nicholas Buildings, Newcastle-on-Tyne; and Arthur Hartley, County Chambers, Castleford. Applications must be made before the 25th inst., and must be accompanied by a cheque for £5. Sealed tenders, endorsed "Tender for Sewage Disposal Works," must be sent to John W. Martin, Clerk to the Council, Council Offices, Normanton.

Nov. 15. **PORTSMOUTH.**—Constructing, completing, and maintaining in thorough repair for six calendar months from the completion of the whole of the following works:—A six-stall urinal in Eastney Road, Eastney, at the side of the new Eastney police station in the borough. Specification and plan may be seen and a form of tender obtained at the Borough Engineer's Office at the Town Hall. Tenders to be sent to G. Hammond Etherton, Town Clerk The Town Hall, Portsmouth. Fair wages clause.

Nov. 15. **WATFORD.**—Construction of about 165 yards lineal of 12in. stoneware pipe sewers, 61 yards lineal of 9in. stoneware pipe sewers, and 138 yards lineal of 9in. stoneware storm water drain, with the necessary manholes, etc., for the U.D.C. Persons may see the drawings and specification and obtain the form of tender and schedule of quantities on application to D. Waterhouse, Engineer, Council Offices, High Street, Watford. Sealed tenders must be delivered to H. Morten Turner, Clerk, Council Offices, 14, High Street, Watford.

Nov. 15. **NEWTOWNARDS.**—Construction of a complete sewerage scheme, for the U.D.C. The works consist generally in the laying of about 15,500 lineal yards of fireclay, stoneware, and iron sewer pipes, varying in diameter from 6ins. to 24ins., with all manholes, lampholes, ventilating shafts, flushing chambers, storm overflows, etc., also the erection of a system of pneumatic ejectors, with air compressing plant and necessary iron pipe lines, with the supply of all material required for the completion of the work. Plans and specifications may be seen, and a copy of the specification, form of tender, bill of quantities, obtained upon deposit of £1 1s, at the office of the Engineers, Swiney and Croasdaile, MM.Inst.C.E., Avenue Chambers, Belfast. Tenders to be delivered to H. McCartney, Clerk of Council, Town Hall, Newtownards. Security required.

Nov. 16. **ROCHDALE.**—Plumbing work required in the provision of six w.c.'s at the cemetery, for the Cemetery Committee. Specification and form of tender may be obtained at the office of the Borough Surveyor. Tenders, endorsed "Tender for W.C.'s," to be delivered to W. H. Hickson, Town Clerk, Town Hall, Rochdale.

Nov. 16. **FILEY.**—Excavation of a trench for a water main, about 4,450 lineal yards in length, extending from the reservoirs at Hunmanby to Filey; also the removal of an existing 6in. main, and the laying of an 8in. main in lieu thereof, for the U.D.C. Specifications can be seen at the office of the Council, Queen Street, Filey. Particulars of Henry Tobey, Engineer, Malton, Yorks. Tenders to be sent to the Chairman, Council Offices, Filey.

Nov. 16. **BLABY.**—Construction of about 1,000 lineal yards of 9in. and 350 lineal yards of 6in. stoneware pipe sewers, together with the necessary manholes, etc., in the parish of Narborough, for the R.D.C. Conditions of contract, specification, and bill of quantities can be obtained from the Engineer, Jas. Turner, at his office, South Wigston, on deposit of £1 1s. Tenders, endorsed "Forest Lane Sewers," are to be sent to B. A. Shires, Clerk to the Council, 1, Friar Lane, Leicester.

Nov. 18. **MORECAMBE.**—Construction of underground conveniences on Promenade, near clock tower, for the Corporation. Plans, specification, and conditions, may be seen, and form of tender and bill of quantities obtained, on deposit of £2 2s. upon application to J. W. Hipwood, A.M.I.C.E., Borough Surveyor. Sealed tenders, endorsed "Tender for Underground Conveniences," to be delivered at the office of Wm. Tilly, Town Clerk, Morecambe.

Nov. 18. **LEEDS.**—Execution of the following sewerage works, for the Corporation:—Nussey's Mill Lane; Clarendon Road; Beckett's Park; and other short lengths of sewers. Drawings may be seen, and forms of tender, with copies of the documents obtained on application to W. T. Lancashire, City Engineer, Municipal Buildings, Leeds, on deposit of £3 3s. Tenders must be addressed to the Town Clerk, Town Hall, Leeds.

Nov. 22. **PIRTON.**—Construction of about 500 lineal yards of 9in. and 140 lineal yards of 6in. earthenware pipe sewer at Pirton, for the Hitchin R.D.C. Plans and specifications may be seen at the office of A. E. Passingham, Clerk to the Council, Old Town Hall, Hitchin, to whom tenders are to be sent.

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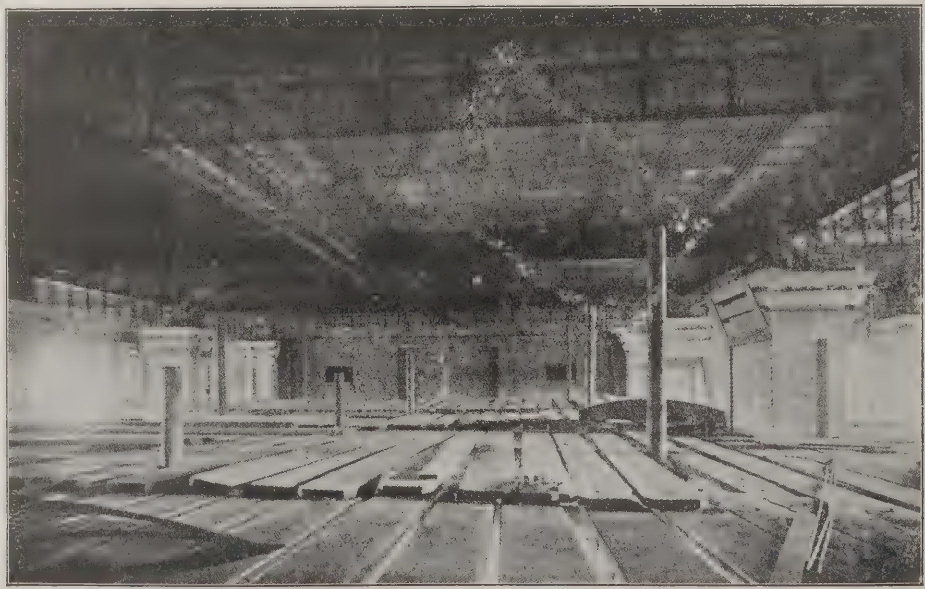

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Nov. 22. **BRENTWOOD.**—Provision, laying and jointing of about 1½ miles of 21in. diameter outfall sewer and about 2 miles of 18, 15, 12, and 9in. diameter intercepting sewers, together with manholes, lampholes, and flushing chambers in connection therewith; also construction of sewage tanks, bacteria beds, sludge lagoons, carriers, and other works incidental thereto, for the U.D.C. Drawings and specifications may be seen, and bills of quantities obtained, at the offices of the Engineers, Willcock and Raikes, 63, Temple Row, Birmingham, on deposit of £5 5s. Tenders to be delivered to C. Edgar Lewis Clerk to the Joint Committee, New Road, Brentwood.

Nov. 22. **BIRKDALE.**—Laying and jointing the following for the U.D.C.:—180 yards 24in. cast-ron pipe effluent drain, 1,470 yards 15in. cast-iron pipe sewers, 930 yards 12in. cast-iron pipe sewers, 4,050 yards 9in. cast-iron pipe rising main, together with the provision, laying and jointing of about 1,580 yards 24in. stoneware pape effluent drain, 570 yards 12in. stoneware pipe sewers, 2,250 yards 9in. stoneware pipe sewers, including manholes, lampholes, and flushing chambers in connection therewith, also for the construction of concrete raft for destructor buildings, tank sewer, pumpwell, sedimentation, and storage tanks and bacteria beds, also the erection of engine house and other works in accordance with the plans, sections, detail drawings, and specification prepared by the engineers. Drawings and specification may be seen and bills of quantities and form of tender obtained at the offices of the engineers, Willcox and Raikes, of 63, Temple Row, Birmingham, on deposit of £5 5s. Tenders to be delivered to J. F. Keeley, Clerk to the Urban District Council, Town Hall, Birkdale.

Nov. 23. **LONDON.**—Construction of a sewer, mainly of cast-iron, lined with concrete and blue brick, of 6ft. to 8ft. internal diameter, and of a total length of about 42,450ft., to be formed mainly in tunnel, together with penstock and weir chambers, and other incidental works, from North-side, Wandsworth Common, Battersea, to the Deptford Pumping Station, Greenwich, for the L.C.C. Persons desiring to tender may obtain drawings, specifications, bills of quantities, form of tender, and other particulars, on application to the Chief Engineer, Maurice Fitzmaurice, C.M.G., at the County Hall, Spring Gardens, S.W., upon payment to the Cashier of the Council of deposit of £10. Full particulars of the work may be obtained on application at the County Hall before the payment of the fee for the specification, etc. Tenders to be delivered, marked "Tender for Low Level Sewer No. 2 South Side," to G. L. Gomme, Clerk of the London County Council, County Hall, Spring Gardens, S.W.

Dec. 1. **WANSTEAD.**—The Urban District Council invite tenders:—1, for the weekly collection of household refuse and ashes; 2, for providing water carts with horses, harness, and men; 3, for providing carts with horses, harness, and men, for general cartage in connection with the roads, etc. In each case alternative prices are to be quoted:—(a) for a period of twelve months ending March, 1911; (b) for a period of 3 years ending March, 1913; (c) for a period of 5 years ending March, 1915. For further particulars apply at the Council Offices, Wanstead, N.E. (Surveyor's Department), where forms of tender can be obtained and con tract form inspected. Sealed tenders to be delivered to Bruce Blewitt, Clerk to the Council, Council Offices, Wanstead.

ROADS AND CARTAGE.

Nov. 15. **PRESTWICH.**—Supply of 380 tons of granite setts, 5in. by 4in., for the U.D.C. The prices quoted must include delivery, carriage paid, at Crumpsall station. Tenders must be sent to Lewis A. Orford, Law Clerk to the Council, Council Offices, Prestwich, near Manchester, and must be accompanied with samples.

Nov. 15. **URMSTON.**—Flagging and kerbing the footpaths in parts of Flixton, Stretford, and Station roads, for the U.D.C. Specifications and particulars can be seer and quantities and forms of tender obtained on application to James Heath, Council Offices, Urmston, upon deposit of £2. Tenders must be forwarded to T. J. Rowland, Clerk to the Council, Council Offices, Croft's Bank Road, Urmston.

Nov. 15. **LONDON, N.**—Construction of a new road at Muswell Hill, N. Plans, details, and sections can be seen, and a copy of the specification obtained, upon personal application to Vigers and Co., 4, Frederick Place, Old Jewry, E.C. A deposit of 5s. will be made for each copy of the specification. Tenders to be delivered to C. J. Hayter, 84, Temple Chambers, Temple Avenue, E.C.

Nov. 15. **KENSINGTON.**—Making-up the roadway of the extension of Oxford Gardens, for the Corporation. Plan and specification may be inspected and further particulars obtained at the Borough Engineer's Department, Town Hall, Kensington. Tenders endorsed "Tenders for Road Works," must be delivered to Wm. Chambers Leete, Town Clerk, Town Hall, Kensington, W. Fair wages clause. Sureties required.

Nov. 15. **HALE.**—Making-up of the carriageways round the Peel Causeway Improvement, for the U.D.C. Cab rank, to be paved with 4 by 6 granite setts, remainder of carriageways to be done in "Tarviated" granite macadam. Specification and bills of quantities can be obtained from the Surveyor, Council Offices, Ashley Road, Hale. Tenders and priced bills of quantities, endorsed "Peel Causeway Improvement," must be delivered to J. G. Whyatt, Clerk to the Council, Council Offices, Ashley Road, Hale, Cheshire.

Nov. 15. **LEEDS.**—Paving and flagging the following streets, for the Corporation:—Albert Street, St. Thomas Street, Station Avenue, Nansen Terrace, Nansen View, Wyther Avenue, Lindley Terrace, Lindley Place, Delph Lane, Hartley Crescent, and Back Heathfield Terrace; also flagging, granite paving and concreting the improvement in Swinegate. Drawings may be seen at the City Engineer's Office, Municipal Buildings. Forms of tender and bills of quantities may be obtained and copies of the documents forming the contract inspected, on application at the Highways Office, 155, Kirkstall Road, Leeds. Tenders must be delivered at the Town Clerk's Office, Town Hall, Leeds.

Nov. 15. **BECKENHAM.**—Making-up the following private streets in the district, for the U.D.C.:—Arrol Road, 300 lineal yards in length; Villiers Road, 200 lineal yards in length; Queen's Road, 300 lineal yards in length; St. James's Avenue, 700 lineal yards in length; Cromwell Road, 450 lineal yards in length. The works include about 9,350 lineal feet Norwegian granite kerb, 1,900 cubic yards hard core, 1,200 cubic yards pit flints, 400 cubic yards Hayes gravel. Together with the remodelling of about 1,950 lineal yards of roadway and the laying of 1,350 lineal feet of 9in. and 750 lineal feet of 6in. stoneware pipes. Plans and sections may be seen, and bills of quantities, specifications, and forms of tender obtained, on application to John A. Angell, Surveyor, on the production of a receipt from the Collector for a deposit of £2. Tenders to be sent to F. Stevens, Clerk to the Council. Fair wages clause.

Nov. 16. **CROYDON.**—Repair of Addison Place, for the Corporation. Plans and specification may be seen and forms of tender obtained on application at the Borough Road Surveyor's Office, Town Hall, Croydon. Tenders to be sent to F. C. Lloyd, Town Clerk, Town Hall, Croydon.

Nov. 16. **EVESHAM.**—Excavating, levelling, and forming the site of the proposed school playground at Prince Henry's Grammar School, now in course of building on Greenhill, Evesham, and stocking-up the Hedge-row and piping the ditch bounding the school grounds on the Inches Lane side, for the Governors. Specifications, with forms of tender, can be obtained of the Governors' Surveyor, R. Webb, 4, North Terrace, Evesham, with whom plans may be seen. Tenders to be sent to Thos. A. Cox, Clerk to the Governors, 2, North Terrace, Evesham. Sureties required

(*Continued on next page.*)

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Millwall, London, E.

And at Edinburgh, Manchester, Birmingham, Glasgow.

Nov. 16. **HOLSWORTHY.**—Steam rolling in the district from date of acceptance of tender to Ladyday next, for the R.D.C. Full particulars and form of tender can be obtained on application to the Surveyor, W. Horace Cousins, Bodmin Street, Holsworthy. Sealed tenders to be sent to Claude Kinsman, Clerk to the above-named Council, 8, North Road, Holsworthy, Devon.

Nov. 16. **LONDON.**—Repair and maintenance of all works of stone paving in the carriageways and footways of the City as may from time to time be required during periods of one, two, or three years, commencing from Christmas Day next, for the Corporation. Terms and conditions may be obtained at the office of the Engineer, on deposit of £2 2s. Tenders must be addressed to the Town Clerk, Public Health Department, Guildhall, E.C. Sureties required.

Nov. 18. **WANDSWORTH.**—Supply of 200 tons of Guernsey granite spalls to be delivered at the Workhouse, Garratt Lane, Wandsworth, for the Union. Tenders must be sent to F. W. Piper, Clerk, Union Offices, St. John's Hill, Wandsworth, S.W.

Nov. 22. **STEYNING.**—Making-up College Hill, Steyning, for the R.D.C. Drawings can be seen at the office of the Surveyor to the Council, Fredk. Slaughter, Assoc.M.Inst.C.E., High Street, Steyning, from whom specifications, etc., can be obtained. Tenders to be delivered to Arthur Flowers, Solicitor, Clerk to the Council, Union Offices, Ham Road, New Shoreham.

Nov. 23. **WEST HARTLEPOOL.**—Supply, during the year ending Dec. 31, 1910, of Yorkshire and concrete kerbstone and flags, scoriæ and whinstone channel blocks, and paving setts; hand, machine, and unbroken whinstone, pitch, tar, and lime, for the Corporation. Specifications and forms of tender can be obtained of Nelson F. Dennis, M.I.C.E., Borough Engineer and Surveyor, Municipal Buildings. Tenders, endorsed with the description of goods tendered for, addressed to the Chairman of the Works Committee, are to be delivered at the office of the Town Clerk, 78, Church Street, West Hartlepool.

Nov. 24. **HAMMERSMITH.**—Making-up and paving Dunraven Road (sec. III.), for the Corporation. Plans and specifications may be seen and forms of tender obtained on application to H. Mair, Borough Surveyor. Tenders must be delivered to H. Thompson, Town Clerk, Town Hall, Broadway, Hammersmith, W.

Nov. 24. **ERDINGTON.**—Supply of 15,500 square yards or thereabouts, of concrete flags, for the U.D.C. Copies of specification and form of tender may be obtained upon application to Herbert H. Humphries, Engineer and Surveyor, Council House, Erdington, to whom tenders are to be sent. Fair wages clause.

Nov. 25. **ASHTON-UPON-MERSEY.**—Reconstruction of Glebelands Road, for the U.D.C. Plan and specification may be seen and bills of quantities obtained on deposit of £1 1s. with Fred. Hutton, Surveyor, Public Hall, Ashton-upon-Mersey. Sealed tenders, endorsed "Glebelands Road," to be delivered to J. O. Barrow, Clerk to the Council, Ashton-upon-Mersey.

Nov. 25. **SUNDERLAND.**—Execution of (1) foundations and track (about 853 lineal yards); (2) paving work; for the Corporation. Specification and form of tender can be obtained on application to the joint engineers, John W. Moncur, Assoc.M.Inst.C.E., Borough Engineer, Town Hall, and Archibald R. Rayson, M.Inst.E.E., Tramways General Manager and Engineer, Tramways Offices, on deposit of £1 1s. Sealed tenders must be delivered to Fras. M. Bowey, Town Clerk, Town Hall, Sunderland.

Jan. 1. **NEWCASTLE, N.S. WALES.**—Supplying and laying an asphalte roadway in Hunter Street and Hunter Street West, in the City of Newcastle, New South Wales. The total area is 37,000 superficial yards, and divided into six contracts, and a seventh contract embracing the whole area. Copy of plan and specification can be seen at the office of the New South Wales Agent-General, 123-5, Cannon Street, London, E.C. Tenders to be sent to F. Scott Holland. Town Clerk, Town Clerk's Office, Newcastle, N.S. Wales.

MISCELLANEOUS.

Nov. 15. **ROCHDALE.**—Supply of stores for the year 1910, as follows, for the Rochdale Canal Co.:—Bedding, bolts and nuts (various), brushes (various), canvas, engine packing, ironmongery, oils and paints, ropes (various). Samples can be seen and approximate quantities ascertained on application at the Company's Stores, 80, Dale Street, Manchester. Tenders must be forwarded to C. R. Dykes, Secretary Manchester.

Nov. 16. **LONDON (for India).**—Supply of crossings and switches, for the Secretary of State for India in Council. Conditions of contract may be obtained on application to the Director-General of Stores, India Office, Whitehall, S.W., and tenders are to be delivered at that office.

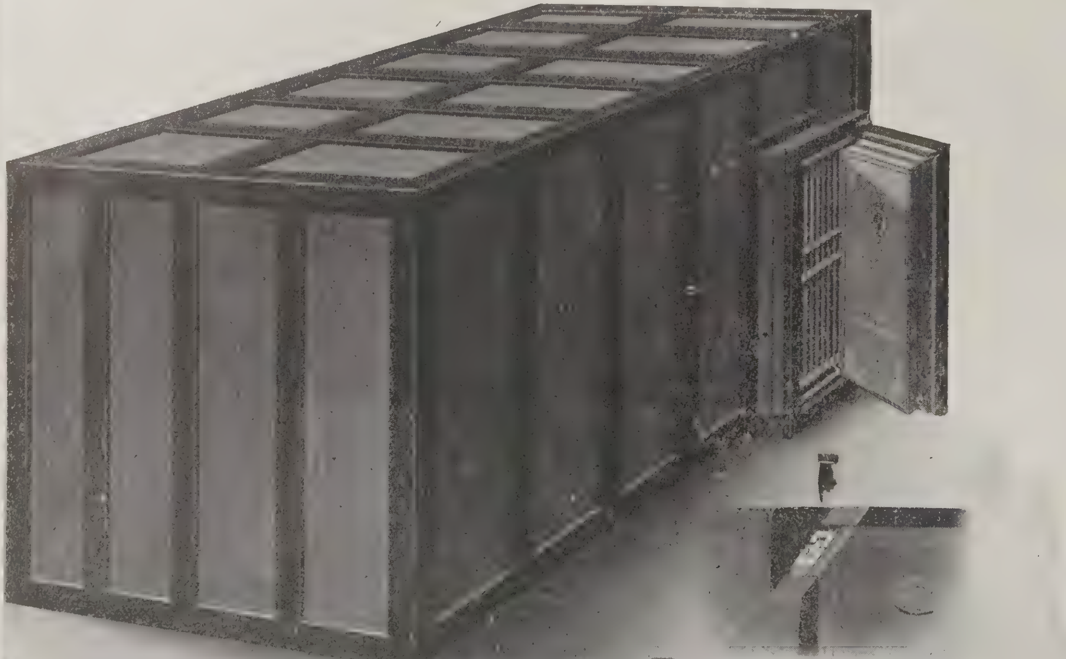
Nov. 17. **DUBLIN.**—Supply among other commodities, the undermentioned stores for 12 months to Dec. 31, 1910, for the Great Southern and Western Railway (Ireland), (the figure after the item refers to the form number):—Acid (sulphuric), 3D; asbestos sheeting, etc., 40; castings, mall. iron, 11; cement, 34; colours. 2; cotton waste, 5A; files and tool steel, 20; fire bricks and clay, 33; fish bolts (steel), 16A; foundry requisites, 42; fuse, 38; galvanised roofsheets, buckets, etc., 23; gelignite, 38; grates, stoves, and tenders, 24; grindstones, 28; glass (sheet and plate), 27A; incandescent fittings for gas, 26C; india rubber goods, 9A; implements, sundry, 21; iron tubes and fittings, 29; iron and steel wire, 30A; locks and keys, 19; nails, 31; oak keys, 35A; oak trenails, 25B; railway fastenings (iron), 16; rain water pipes and gutters, 25; ropes, twine and flax, 4; sewer pipes, plaster of Paris, etc., 32; shovels, shades, etc., 21A; signal wire pulleys, 11; screws and split pins, 14; stakes (fencing), 35; tin plates, 22; varnishes, 1; wire, fence and signal, 30A; wirework, 30B. Forms of tender can be obtained on payment of 6d. each from the Company's Storekeeper, at the General Stores, Inchicore, Dublin, to whom inquiries for information should be made direct. Patterns may be inspected at the same place. Tenders to be sent, endorsed "Tender for Stores," and addressed to R. Crawford, Secretary, Kingsbridge Terminus, Dublin.

Nov. 19. **DEVONPORT.**—Supply of the following stores and materials from Jan. 1 to Dec. 31, 1910, for the Corporation:—1, masons', plasterers', and slaters' materials; 2, carpenters' materials, labour, etc.; 3, Smith' materials, labour, etc.; 4, painters' and glaziers' materials, labour, etc.; 5, plumbers' and gasfitters' materials, labour, etc.; 6, ironmongery; 7, sand; 8, brooms. Forms of tender may be obtained at the Borough Surveyor's Office, Devonport. Sealed tenders must be delivered to R J. Fittall, Town Clerk, Municipal Offices, Devonport.

Nov. 23. **WEST HARTLEPOOL.**—Supply of the undermentioned goods and materials during year ending Dec. 31, 1910, for the Corporation :s1, kerbstone, flags, channel blocks, paving setts, whinstone, pitch and tar, lime; 2, earthenware sewer pipes; 3, metal castings; 4, cement; 6, disinfectants; 7, horse provender; 8, cartage, West Hartlepool; 9, cartage, Seaton Carew; 10, general hardware, picks, and shovels, scythes and brushes, galvanised pails, sanitary pans, oil, waste, firewood, packing, and blacksmith's materials; 11, cart repairs. Specifications and forms of tender can be obtained of Nelson F. Dennis, M.Inst.C.E., Borough Engineer and Surveyor, Municipal Buildings, and samples of stores seen at the Corporation Depot. Tenders for all goods, excepting disinfectants, to be addressed to the Chairman of the Works Committee, those for disinfectants to the Chairman of the Health Committee, are to be delivered at the office of the Town Clerk, 78, Church Street, West Hartlepool.

STEEL STRONG ROOM.

Measurements: 18 ft. × 13 ft. × 8½ ft.



Top corner of door closed and part cut away to shew the grip of the PATENT CHANNEL BOLT.

FROM A PHOTOGRAPH

Undrillable Burglar-proof Doors fitted with patent "Channel Bolts." Supplied February, 1909, to the **Anglo - South American Bank, Ltd.,** for their new Chief Offices in Old Broad Street, London, E.C.

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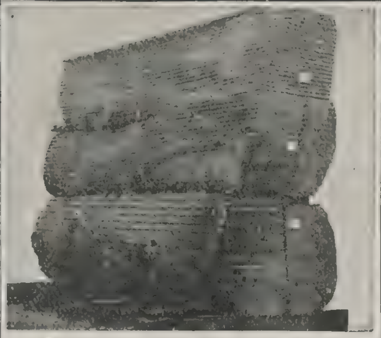
BIRMINGHAM.
Telegrams: "PHILLIPSON Birmingham."
Telephone Nos. 481 and 1641 Midland



Quartered Oak Butts in Stick before going into Dry Shed.

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Telegraphic Address: "Buildable, London."

Telephones: ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817, Gerrard. PUBLISHING—2200 Holborn (six lines).

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Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bargoed (Wales).—For the erection of 20 or more houses at Bargoed, for the Graig Building Club, Bargoed. Mr. H. Gabe Jones, architect, Hengoed:—

	£	s.	d.
F. D. Watkins	£215	0	0
Vodder and Lee,* Bargoed ...	198	15	0
H. J. Davies	196	17	0

*Accepted.

Camborne (Cornwall).—For the construction of an open reservoir (1,000,000 gallons) and water-tower, for the Camborne Water Co. Mr. F. W. S. Stanton, A.M.I.C.E., engineer, 10, The Paddock, Chatham:—

	£
Pethick Bros., Ltd., Plymouth ...	£4,915
W. C. Shaddock, Plymouth	2,831
H. V. Smith and Co., Ltd., Westminster	2,647
W. E. Bennett, Bodmin	2,549
R. C. Brebner and Co., Edinburgh ...	2,468
H. Thomas and Son, Crowan	2,430
A. Carkeek,* Redruth	2,414
Mitchell and Bon, Camborne	2,353

*Accepted.

Colchester.—Accepted for erection of the Colchester Technical Institute and Girls' School.

Parkington and Son, Ipswich, £11,120.

Coalbrookdale (Salop).—Accepted for erection of the Madeley secondary school, for the County Council. Mr. J. Holt, A.R.I.B.A., 9, Albert Square, Manchester, architect.

H. Dorse, Cradley Heath, £5,859 15s. 9d.

Cwmbran (Mon.).—For additions and alterations to Cwmbran Police Station and Court, for the Standing Joint Committee. Mr. William Tanner, F.S.I., county surveyor:—

	£	s.	d.
D. Davies and Sons, Cardiff ...	£1,422	0	0
Blundell and Bevan, Blackwood	1,260	15	0
R. W. Moon	1,135	0	0
A. and J. Richards, Griffithstown	1,117	0	0
J. Charles	1,100	0	0
J. Jenkins, Ltd.	1,090	0	0
A. S. Morgan and Co. ...	1,060	0	0
J. Brownscombe and Son ...	1,050	0	0
R. Partridge, Cwmbran ...	1,050	0	0
C. H. Reed	1,048	0	0
C. W. Simmons, Cwmbran ...	997	15	0
G. F. Leadbeter	976	0	0
J. H. Williams*	959	0	0

Rest of Newport.
*Accepted.

East Kirkby.—For pair of cottages, Welbeck Street, East Kirkby, for the Kirkby-in-Ashfield Industrial Co-operative Society, Ltd., High Street, Long Eaton, near Nottingham. Walter H. Woods, M.S.I., architect:—

	£	s.	d.
Coleman and Blackburn, Kirkby	£450	0	0
J. Stowe, East Kirby	442	10	0
Bains, Kirkby-in-Ashfield	440	0	0
J. C. Green, Kirkby-in-Ashfield	415	0	0
A. G. Limb, East Kirkby ...	410	10	0
Hibbert, East Kirkby	405	0	0
Tate and Son, Annesley Woodhouse	394	10	0
A. W. Hoole,* Kirkby-in-Ashfield	389	10	0
Sewell, East Kirkby (withdrawn)	361	0	0

*Accepted.

Forfar.—For extending the Academy, for the School Board. Accepted tenders:—

	£	s.	d.
J. Laird, mason (Burghmuirhead stone)	£2,097	0	0
D. Stewart, joiner	1,377	0	0
A. M'Laren and Sons, plumbers	422	15	0
J. Kerr, slater	135	0	0
D. Masterton, plasterer ...	126	0	0
J. Boyd and Sons, Paisley, heating	225	5	0

Hinckley (Leics.).—For erection of additions to Sketchley Dye Works, Hinckley. Mr. W. T. Grewcock, A.R.I.B.A., architect, Leicester and Hinckley:—

	£	s.	d.
Haskard, Rudkin and Beck	£3,670	0	0
H. Herbert and Sons	3,664	0	0
Bowles and Sons	3 660	0	0
S. Hutchinson and Sons ...	3,590	0	0
T. Herbert	3,585	0	0
Scurr, Jowett and Co.	3,450	0	0
S. Chapman and Son	3,440	0	0
Bradshaw Bros.	3,433	0	0
A. Jeffcote, Hinckley ...	3,372	11	6
S. Bentley and Co.*	3,319	0	0

*Accepted.

Minster-on-Sea, Isle of Sheppey.—Accepted for a detached cottage, Seaside Avenue, Minster-on-Sea, Isle-of-Sheppey. J. Wornell, architect, The Land Co., 68, Cheapside, E.C.

Hancock and Kettle (Minster-on-Sea), £160.

(*Tenders continued on page viii.*)

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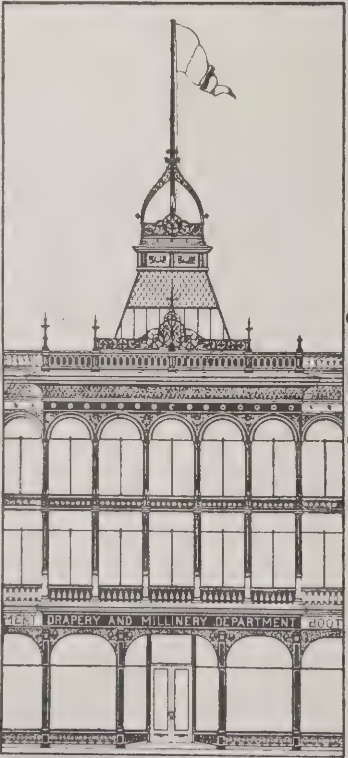

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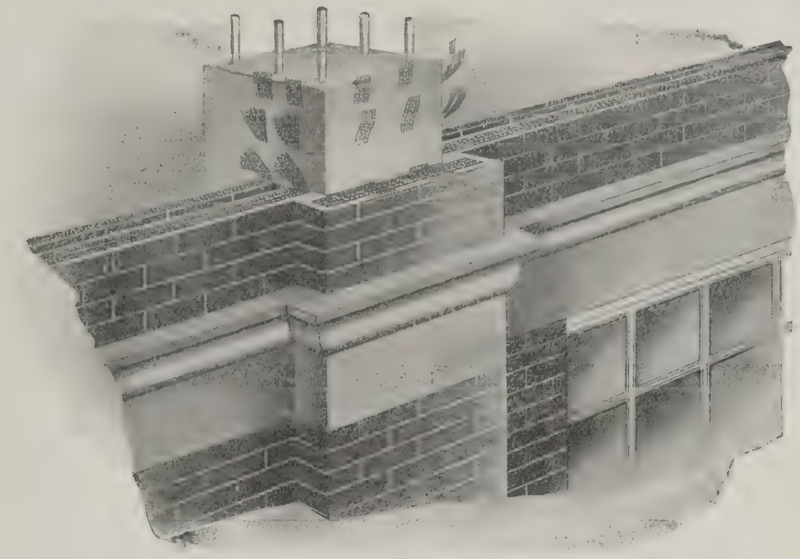

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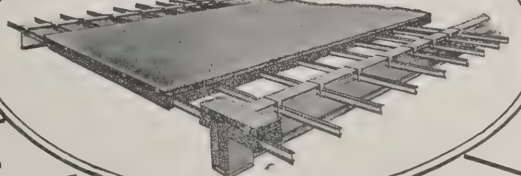

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A.W.E.

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(Tenders continued from page vi.)

London, S.E.—For the enlargement and alteration of the Woolwich fire-station for the London County Council:—

C. Wall, Ltd., 4, Lloyd's Avenue, E.C.	£5,525
Leslie and Co., Ltd., Kensington Square, W.	5,511
Holloway Bros. (London), Ltd., Belvedere Road, S.E.	5,400
Kirk and Randall, Woolwich, S.E.	5,377
Higgs and Hill, Ltd., Lambeth, S.E.	5,287
F. and H. F. Higgs, Herne Hill, S.E.	5,145
H. L. Holloway, Deptford, S.E.	5,093
J. Carmichael, Wandsworth, S.W.	4,947
W. Johnson and Co., Ltd.,* Wandsworth Common, S.W.	4,800

Architect's revised estimate, £5,350.
*Recommended for acceptance.

Napsbury (Middlesex).—For additions to Napsbury Asylum, for the Middlesex County Council, Mr. Rowland Plumbe, architect, 13, Fitzroy Square, W.:—

H. J. Williams, Ltd.	£71,300	0	0
J. Allen and Sons, Ltd.	70,070	0	0
Dick, Kerr and Co., Ltd.	68,469	3	6
Higgs and Hill, Ltd.	68,244	0	0
Holland and Hannen	66,750	0	0
J. Carmichael	66,100	0	0
C. Wall, Ltd.	65,000	0	0
Chessum and Sons	64,760	0	0
J. Greenwood, Ltd.	64,450	0	0
Pethick Bros., Ltd.	63,266	0	0
Waring and White, Ltd.	63,041	0	0
Mowlem and Co., Ltd.	62,913	0	0
Holloway Bros., Ltd.	62,600	0	0
Perry and Co., Ltd.	61,975	0	0
Pattison and Son, Ltd.	61,120	0	0
F. G. Minter	61,000	0	0
H. Lovatt, Ltd.	60,915	0	0
Spencer, Santo and Co., Ltd.	60,760	0	0
Leslie and Co., Ltd.	60,358	0	0
Foster and Dicksee, Ltd.	59,859	0	0
G. E. Wallis and Sons, Ltd.	58,276	0	0
W. Johnson and Co.	57,756	0	0
W. Lawrence and Son,* Moselle Works, Tottenham, N.	56,948	0	0

(Architect's estimate, £62,004.)
*Provisionally accepted.

Old Brompton (Kent).—For the demolition of certain buildings, and the erection of a masonic hall, at Wood Street, Old Brompton, Kent, for the Trustees of the Brownrigg Lodge of Freemasons:—

F. Leonard, Rochester	£1,549
H. R. Richardson, Gillingham	1,530
G. Gates and Sons, Frindsbury, Rochester	1,500
H. J. Smith and Son, Maidstone	1,499
T. Cornelius, Gillingham	1,487
F. and G. Foster, Norwood Junction, S.E.	1,462
C. E. Skinner, Chatham	1,417
C. Seager, Sittingbourne	1,398
West Bros., Rochester	1,375
G. Baker and Son, Strood, Kent	1,363
E. W. Filley, Chatham	1,330
H. E. Phillips,* Gillingham	1,295

*Accepted.

Pwllheli (Wales).—For erecting a new residence at Llwynhudol, Abererch, Pwllheli, for Mrs. M. Williams. Mr. R. Lloyd Jones, architect, 36, High Street, Pwllheli:—

Jones, Roberts, and Jones	£910	0	0
E. Jones	900	0	0
O. Parry	849	0	0
J. T. Jones	820	0	0
J. H. Roberts	767	0	0
E. Williams	766	0	0
E. Thomas	728	17	0
G. Jones,* Morfa Nevin, Pwllheli	683	0	0

*Accepted.

Rugby.—For the erection of headquarters for Howitzer Battery, Rugby. Mr. J. H. Liddington, architect and surveyor, Ketton Chambers, Regent Street, Rugby.

Messrs. Linnell and Son, Rugby	£2,672
Messrs. J. Parnell and Son, Rugby	2,655
Messrs. Foster and Dicksee, Ltd., Rugby	2,620
Mr. J. Hollowell, Rugby	2,489
Mr. C. Cockerell,* Rogby	2,480

*Accepted.

Stroud.—Accepted for erection of a new craft school at Stroud, for the Gloucestershire Education Committee. Mr. R. S. Phillips, Midland Bank Chambers, The Cross, Gloucester, architect.
Orchard and Peer, Bowbridge, Stroud, £2,497.

Three Bridges (Sussex). — For rebuilding the "Plough Inn." Mr. C. H. Burstow, architect, 6, West Street, Horsham. Quantities by the architect:—

T. Webber	£1,536	0	0
G. Potter	1,513	0	0
H. Baker and Son	1,485	0	0
Hillman and Murrell	1,468	8	9
Murrell Bros.	1,461	6	4
A. Peskett and Co.	1,459	0	0
Rowland Bros.	1,449	0	0
W. Potter	1,425	0	0
W. H. Simmonds	1,419	1	7
W. Arthur	1,413	17	4
C. W. Peters	1,391	0	0
J. Ockenden and Son	1,345	0	0
Bartley and Ward	1,289	0	0
R. Cook and Sons,* Crawley	1,250	0	0

*Accepted.

Tolworth.—Accepted for erection of proposed new school, for the Surrey Education Committee
W. Lawrence and Son, Waltham Cross, £7,692.

Wolsingham (Durham).—Accepted for the erection of new secondary school buildings at Wolsingham, for the Durham County Education Committee.
Walton Bros., Crook, £10,750.

Walthamstow.—For the erection of Higham Hill new school on the Bulls' Farm Site, for the Walthamstow Education Committee. Mr. H. Prosser, M.S.A., architect. Quantities by Mr. G. T. G. Wright, F.S.I., 3, Great Winchester Street, E.C.:—

C. Roper, Ipswich	£7,990
J. Stewart, Tottenham	7,586
Webb and Co., Walthamstow	7,499
Shurmur and Sons, Upper Clapton, N.E.	7,326
Perry and Co., Victoria Street, S.E.	7,260
Smith and Sons, South Norwood	7,260
Lawrance and Sons, City Road, N.	6,992
Lawrence and Son, Waltham Cross	6,884
B. E. Nightingale, Albert Embankment	6,775
Brand, Pettit and Co., Tottenham	6,655
H. C. Horswill, Forest Gate	6,643
Gathercole Bros., Norbury, Surrey	6,600
H. J. Carter, Grays, Essex	6,590
W. E. Davey, Southend	6,469
W. J. Maddison, Canning Town	6,399
J. and J. Dean, Walthamstow	6,395
A. Monk, Lower Edmonton	6,390
Hammond and Son, Romford	6,369
F. J. Coxhead, Leytonstone	6,311
Knight and Son,* Tottenham	6,269
T. M. Moss, Southend	6,200
R. and E. Evans, Peckham	5,987

*Accepted.

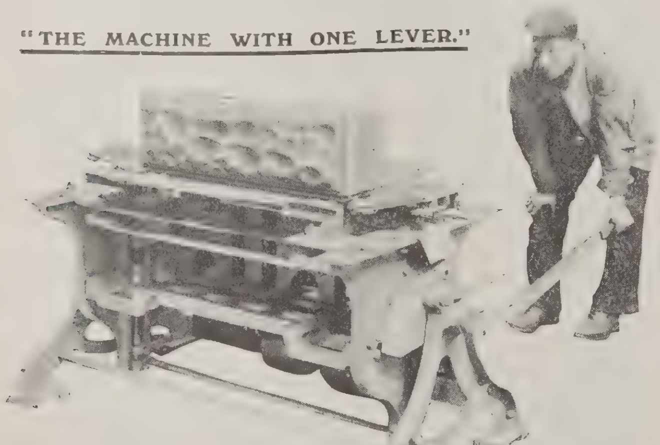
TO CONTRIBUTORS.

Owing to the very large number of voluntary contributions submitted to the Editor, it has been found desirable to make the following regulations:—

1.—Intending contributors are advised to send a preliminary letter before forwarding articles and illustrations. The non-receipt of a reply within one week is to be taken as a polite negative. MSS. and drawings in all cases should be accompanied by sufficient stamps to cover return postage.

2.—The Editor declines to take any responsibility for the safety or return of contributions submitted although every care will be taken where these regulations are complied with.

3.—Each MS. and illustration should bear the name and address of the owner or sender.



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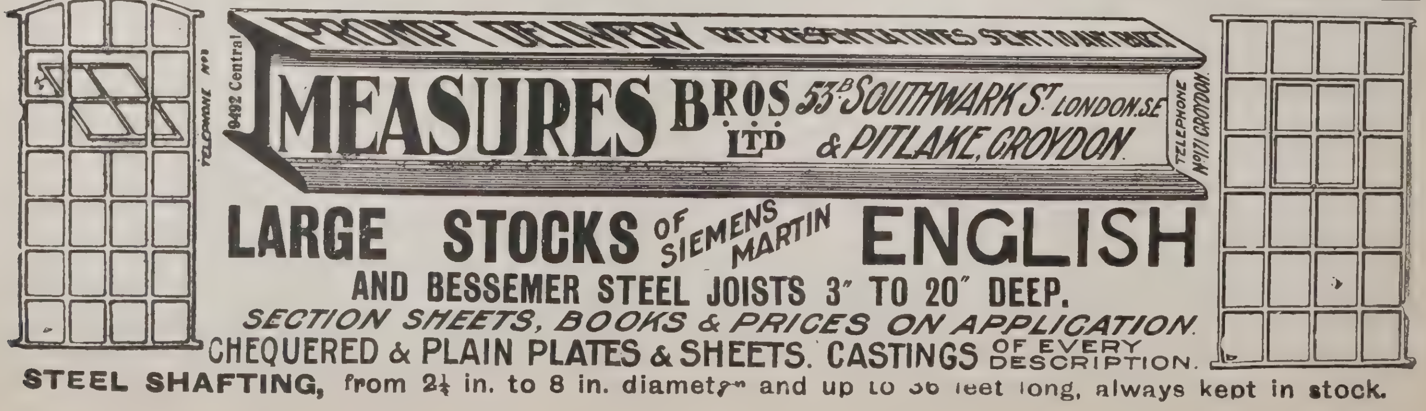
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November 17, 1909. Volume 30, No. 771.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

This issue contains the Official Reports of the National Building Trades Federation, and articles of special interest to Builders and Contractors.

Caxton House, Westminster.

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Professional Tendering.

At a meeting of the Quantity Surveyors' Association held last Wednesday, Mr. H. T. A. Chidgey, the president, in supporting a vote of thanks to Mr. William Woodward, F.R.I.B.A., for his paper on "Quantities and the Quantity Surveyor from the Architect's Point of View," referred to the question of tendering for quantities. There is, he admitted, no objection to the mere fact of tendering *per se.* "Our friends the builders," he said, "are tendering all day and every day," and it cannot be accounted to them for a crime. But, clearly, the builder, dealing with such a large number and variety of conditions, has fairly free scope for making his price pay. That he does not always succeed in this object is as lamentable as true. The case of the quantity surveyor, however, is very different. If, having secured the work at a low tender, he is to make it pay, he can only do it at the expense of the client. "It means this," said Mr. Chidgey, "that if a man who is tendering for quantities puts in, as so many men have put in, ridiculously low prices, he cannot give the work which a client is entitled to expect when he asks for a bill of quantities." Tendering, in any form, udoubtedly lends itself with peculiar facility to many abuses. On the other hand, in the case of a trade like building, it is not without its advantages. It ensures, for instance, a much wider distribution of the general volume of work. In the main, however, it is the client who reaps most benefit from the system, and that is the reason why he is endeavouring to extend it to all and sundry. He is trying to apply it to architects, and having been, unfortunately, rather successful in that direction, he is keen on bringing quantity surveyors under the yoke. He does not see, or he wilfully ignores, the fundamental difference between the case of the professional man and that of the tradesman. The latter, as we have said or implied, has to deal with a large number of data which allow of diversity in the handling. With the former, the circumstances are less variable and less elastic. The professional man has had a costly education and training, and is entitled to expect a fair return on the outlay. His services are professional and personal, and their value has been as fairly as possible assessed by the consensus of those who are best qualified to judge of it. That value cannot be depreciated without prejudice to the best interests of both the client and the professions, and therefore the professions are fully justified in making the strongest possible stand against a system that, if it is allowed to become general, must result in all-round degradation. Now is the time to stamp it out, and this can only be achieved by organised effort. The organisations exist. All that is necessary is to accord them loyal and hearty support. The good men still remaining outside those organisations are no doubt numerous. The present crisis affords a further striking illustration of the folly of holding aloof. Surely they must realise that their isolation, however "splendid," greatly weakens their own position and that of the organisations which are fighting their battles. If the professions were solid for the maintenance of their dignity and the assertion of their rights, their just demands would be irresistible; but there must be firmer discipline—an observation that applies more pointedly to the R.I.B.A. than to the Quantity Surveyors' Association, which, we understand, does not allow members to break the rules with impunity.

The Style of the Future.

Within the past few days the newspapers have given up much space to the wild sayings of the Futurists. Mr. Andrew Lang (who had only heard of them the day before writing his column of pleasant raillery in the "Morning Post") declares that most of their ideals were all anticipated at the dawn of civilisation, and the remainder soon afterwards. Whether the Futurists have yet invaded the domain of architecture we are not informed; but they have at least given a catchword to a journalist reporting a lecture on architecture which was delivered by Mr. F. M. Simpson, F.R.I.B.A., to the Sheffield Society of Architects. The heading to the report is "Improved Architecture. Sheffield Lecturer on the Style of the Future." Any assurance that Professor Simpson said nothing to justify this absurd label is unnecessary. He dealt mainly with the past, stating that the end of the eighteenth century was an age of shattered traditions, the first half of the nineteenth century was an age of archæological revivals, the middle period seeing the cult of so-called Queen Anne, and the last quarter being remarkable for a notable advance in civic architecture. He did not (if we may be pardoned the Stock Exchange jargon) speculate heavily in futures. He merely said that "there was now, he thought, every chance that the twentieth century might possess what the nineteenth never attained to, a recognised vernacular style, based on tradition, but not fettered by it, and original without being eccentric." That is not prophecy. If it is in any respect a forecast, it is akin to the intelligent anticipations of the official meteorological experts, who simply predict the weather that is seen to be coming along. We rather like the idea of a distinctive twentieth-century style, and trust that no sudden change in the wind may falsify the pleasant prognostication: a fearsome word, but not contradictory of our contention, because it seems to imply knowledge of existing phenomena, and logical and legitimate deduction therefrom; which is all that Professor Simpson attempted, he being much too wise and prudent to predict anything that is not in sight.

A Question of Values.

It is with mixed feelings that one notes the success of the strenuous endeavour that was made to keep Holbein's "Duchess of Milan" in this country. It is impossible not to admire the faith, pluck, and energy of the band of art enthusiasts who have, against all probability, secured this result; and as for the generosity of the unnamed contributor of the trifling item of £40,000 sterling towards the £70,000 demanded as the ransom of this bit of painted canvas, that is so stupendous as to seem well-nigh incredible. The Unity of Art being indisputable, our special interest in the Mistress Art being manifest, and the incident being so heroically magnificent and munificent, we hardly like to insinuate a lurking doubt as to whether the money could not have been more worthily spent. Paint and canvas, no matter how cunningly combined, nor by what transcendent genius of the brush, is, after all, to be judged by its power, and the duration and extent of that power, of giving enjoyment—a poor word that is here meant to connote a good deal more than it expresses; and we must confess that we are in thorough agreement with the remark made by Mr. Ernest George, in his Presidential address to the Royal Institute of British Architects, to the effect that the art of the architect, and the width of the appeal and the enduring character of noble buildings, are as yet comparatively unappreciated. Is it not strange, and well-nigh unaccountable, that the cloistered virtue of a painted picture should be so much more highly esteemed as a "thing of beauty," and—to complete the echo of Ruskin—should command so disproportionately high a "price in the market," as compared with the building that, more protecting than protected, delivers its mute message in the open air, and influences all its surroundings and every passer-by? Perhaps the fact that such vast sums are lavished on one form of art is encouraging to the others; but it would seem that in this, as in other matters, the public is addicted to concentrating itself on one idea at a time. But is it not nearly the turn of Architecture to become the prime favourite?—or, at all events, to be esteemed at something like its relative value to the community, if not to the connoisseur? We recognise the fallacy of comparing unlike things; but we nevertheless maintain that too much wealth is being lavished on Old Masters, and too little on modern architecture.

Mediæval Sham and Shoddy. The "audacity, and even recklessness," of mediæval builders is commented upon by a leader writer in the "Times" with reference to the discoveries that have been made by Mr. W. D. Caröe at Canterbury Cathedral. Professor Willis and Mr. Caröe, with fine prescience, imagined that the supporting piers of the central tower possibly encased the original Norman piers of Lanfranc's building. It is now proved that the present piers are merely shells, less than a foot thick. The space between this shell and the Norman piers is filled with rubble, which "seems to be separated from the Norman piers by a clear space about half an inch wide, as though a wooden core had been purposely used round the old pier and withdrawn as the new work went up." There is some reason to suppose that the disguising, or, rather, concealment, of the earlier styles is not uncommon, for "the Gothic builders seem to have had a positive distaste for Norman building, just as we have a distaste for clothes and other things that have lately gone out of fashion. Whenever they could, they destroyed Norman work, as in the naves of Canterbury and Winchester. Indeed, the changes in mediæval architecture were often as sudden and violent as modern changes of fashion." Perhaps Gloucester is a case in point, although here the disguise is extraordinarily incomplete; for while the exterior is rather pronounced Gothic, the inside, with its massive rounded pillars, is more than suggestive of Norman, so that, on entering the cathedral, the stranger, and even the habituê who has any sense of style, receives a rather severe shock. The surprise, however, is rather less disconcerting than that which arises from Mr. Caröe's discovery at Canterbury, for the fair inference is that, although the mediæval men may have "builded better than they knew," they builded rather worse than we had suspected. Mr. Caröe says that their engineering skill and daring were by no means contemptible; but his adjective seems to suggest itself as being very appropriate to their methods, or at least to their shams and subterfuges; and the revelations at Canterbury and Winchester do not reassure us as to their engineering skill. But there is no question about their daring, which, like most examples of reckless audacity, was largely the outcome of ignorance. Their "engineering skill," although perhaps not contemptible, was extremely superficial, as the custodians of our old cathedrals will ruefully admit.

The Committee of the Royal Sanitary Institute (90, Buckingham Palace Road, S.W.) are arranging for short exhibitions of sanitary apparatus, the first of which, opened from November 10th till the end of January, 1910, comprises working models of sewage distributors and sprinklers, shown in action. It is announced that the Council have accepted an invitation from the Town Council of Brighton to hold the next Congress and exhibition of the Institute in Brighton during the first two weeks of September, 1910.

Correspondence.

[*The Editor declines responsibility for the statements made or opinions expressed by correspondents.*]

Reinforced Concrete Systems.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—We noticed that in your issue of November 10th, in your article of Reinforced Concrete Systems, you are publishing a section of a floor which is an infringement of our patent No. 25301/05, namely, Fig. 12, on page 336. Messrs. Leslie and Co., Ltd., who have published this in your paper, hold no license from us to use this floor, in respect of which we are the patentees. We must therefore request that you will be good enough to insert this letter in your paper in order that it may be known that we are prepared to take action to protect our rights against the manufacture of this floor without our license.

Yours faithfully,
UNITED KINGDOM FIRE-PROOFING CO., LTD.,
GEO. H. GASCOIGNE,
Managing Director.

Architectural Competitions.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I write with reference to your article on "The Moral of Middlesbrough," because I think you draw a wrong and a dangerous moral, and your reasoning is a tacit encouragement of what is the greatest evil which exists in these matters, the loose and slipshop way in which the system is worked.

As to the particular competition in question, the writer, with others, competed; with others regarded the conditions as in many ways absurd, but with others when they were insisted upon and reiterated in the replies to queries, conformed to them. As a matter of fact the writer threw away a plan which was almost line for line with that given the first place, because it clearly violated conditions which were reiterated. The writer did not join in the protest, as he was clear on the legal aspect of the question, and also knew it was not one of the best cases to protest about, as there were absolute advantages in favour of a design which violated the conditions laid down. Logically it does not matter in the least if such is the case, but experience shows that architects are not among the most logical of mankind.

It is perfectly true, as you say, that public bodies do not hold competitions in order to give prizes to architects, but it is equally true that the inducement they offer to architects is that in return for a number of men giving them the right to choose between a large number of designs, the public body binds itself to carry out more or less clear regulations in making its decision. Mr. C. A. Russell rightly says, "the only effectual protection of competitors is the competence and fairness of the assessor. When competitors have definite and binding conditions laid down for them, it is unfair to disregard such conditions. It is giving to A, who has given what you have bound yourself not to take, what belongs to B, who has unfortunately believed your clearly-stated intention. It overlooks the fact that B may be, and very likely is, quite as competent to give you what you want as A—that B, in fact, can give you the arrangement you now know you would like to have in actual fact. By adopting a design you do not pledge yourself to build it without alteration or amendment, while you have pledged yourself to give your award within certain conditions. Moreover, it is far easier to break than to keep conditions.

Assessors too frequently act as if it were theirs to express opinion, and not to act as the recorders of justice. Again, within the lines of the conditions, there is in very many cases only one possible winner, who would be the winner were the competition impartially assessed by almost any competent man. Outside the conditions you are in a desert of opinion, and six competent judges may have reason to come to six different solutions. While the award which is based on facts cannot be cavilled at, as it is fair, that based on opinion, however fair, will always be open to question.

The root of the matter seems to be that among architects there are very few men who have the judicial and logical instinct. Possibly they try to do too much. Their function should be, firstly, secondly and thirdly, "to determine which of the designs conform to the conditions"; and if they do this, they have not a whole field but a single furrow in it to examine. Any gifted man might fail in the first, any competent man should succeed in the second case.

If conditions of a binding character fetter genius, it is easy to do away with them; though many of us would not care for the open lottery which would then remain; but we should have the option of taking it or leaving it.

"EXPERIENCE."

[Our correspondent's letter has been slightly modified in one or two places, without affecting his contention. We certainly cannot agree that it is the whole duty of assessors "to determine which of the designs conform to the conditions." If the conditions are bad, and defeat the object, it is perhaps the duty of the assessor to exercise his judgment in the choice. But we are always in full sympathy with the victims of ill-drawn conditions, and we feel that it would be more advantageous to insist on the proper drawing-up of conditions than to chop logic as to how, being bad or ambiguous, they should be interpreted.—Ed.]

At the meeting of the Architectural Association held on Friday, November 5th, the following elections were announced:—C. Grellier, Epsom; E. K. Rowe, Westcliffe-on-Sea; H. M. Whitehead, Brentford, W.; A. B. L. Roberts, Chelsea, S.W.; R. Williams, Clifford's Inn, E.C.; R. S. Cobb, Shortlands, Kent; N. A. Walton, Stockwell, S.W.; J. Basevi, Stockwell, S.W.; W. S. Peto, Stockwell, S.W.; Hon. L. J. Fiennes, Reading.

* * *

Mr. W. D. Caröe's statement in "The Times" that the Norman piers supporting the Angel Steeple, Canterbury Cathedral, were cased in by later work, and that the rubble filling between the casing and the contained piers was separated from the Norman work by a clear space about half-an-inch wide, "as though a wooden core had been purposely used round the old pier and withdrawn as the new work went up," is opposed by Mr. W. H. St. John Hope, who attributes this curious arrangement to the early buckling of the piers. Mr. Hope also holds that the casing was carried out in Chillingden's time, and not in that of Archbishop Chicheley.

* * *

Mr. A. C. Benson's recent article in the "Church Family Newspaper" on the Right Principles of Church Restoration to which we have recently referred, continues to attract considerable correspondence. In a recent issue of our contemporary, Mr. Jethro A. Cossins, architect, of Birmingham, draws attention to many of the enormities of the "restorers;" the old stone pavements, often largely composed of gravestones with inscriptions, which are taken up to make way for hard tile pavements, the nailing of old brasses to walls in spite of the "hic jacet" of their inscriptions; the pitchpine woodwork which replaces old oak; the stripping of plaster from the walls and treatment of the stone surface with ridged lines of black mortar; the "dragging" or tooling of all old freestone details; the filling of the windows with cathedral glass. Mr. George Jack, also a supporter of Mr. Benson's views, recommends the procedure of the "Society for the Preservation of Ancient Buildings," and points out the necessity for the architect devoting his whole time and attention to the work.

LEITH'S GERMAN-MADE SCHOOLS.

Strong Protest by Edinburgh and Leith Builders.

A special joint meeting of the Edinburgh, Leith and District Building Trades Association, and the Building Trades Exchange of the City and District of Edinburgh, was held in the Exchange Board-room, 61, Lothian Road, Edinburgh, on Wednesday evening, November 3rd. The circular calling the meeting states that "it appears that some time ago the Leith School Board decided to have two schools built on the Doeker principle, and sent the order direct to Germany without asking the local (or even British) builders to tender for the work. The whole question is one that affects the Edinburgh and Leith building trade in general, and those members of the trade who are ratepayers in the Burgh of Leith in particular. Over and above, there is a question of principle involved. A meeting of the trade is therefore hereby called to consider the whole matter, and to take such steps as may be deemed proper and expedient."

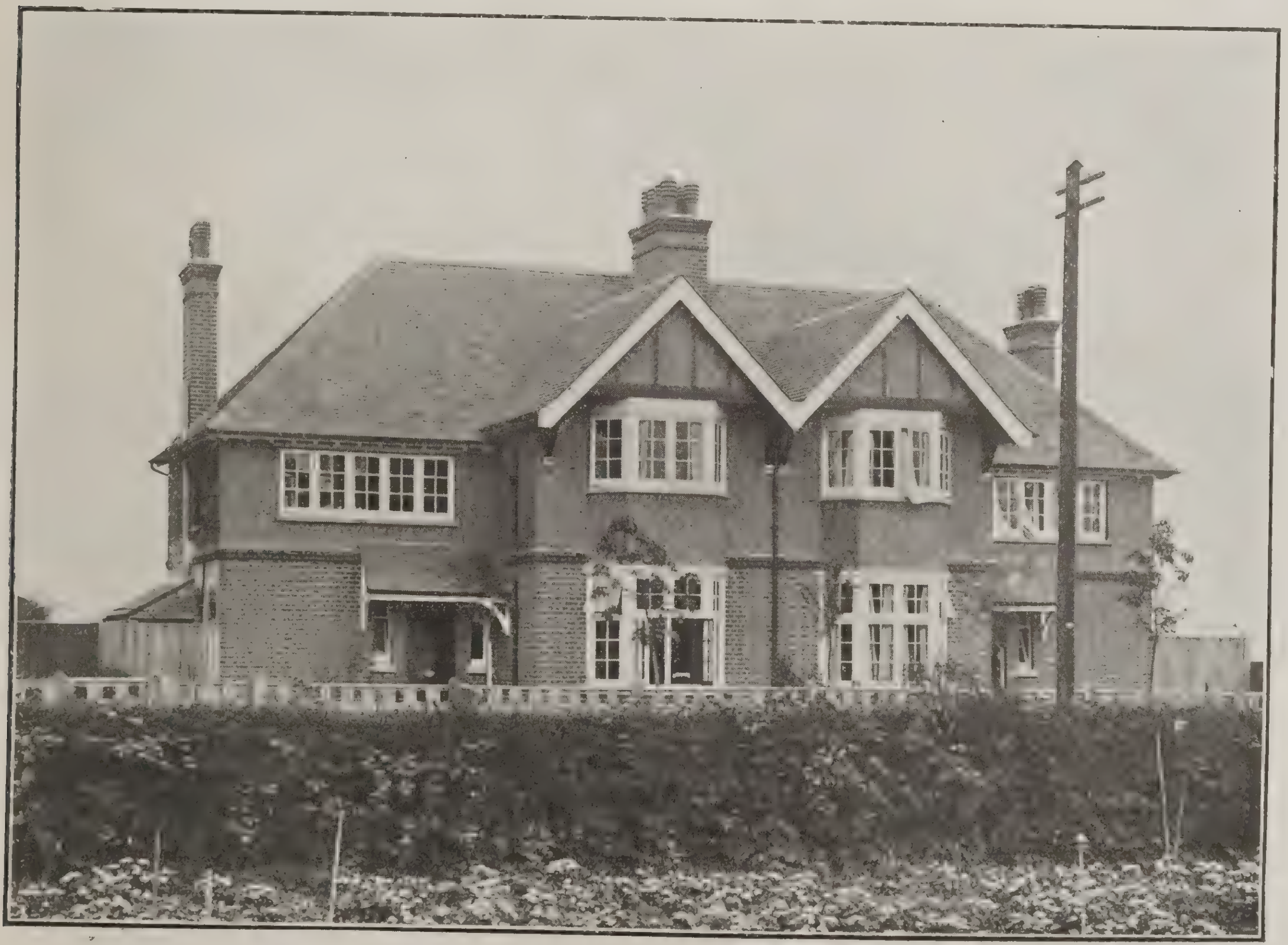
Mr. W. Graham-Yooll, chairman of the Building Trades Exchange, presided over a representative gathering. At the outset he stated that the political aspect would not enter into the discussion. The two schools which the Leith School Board were going to erect each accommodated 480 scholars, and together would cost from £13,000 to £14,000. An ordinary permanent school erection would cost between £10 and £12 per scholar, and the Scottish Education Department limited the expenditure to that sum. The new schools, however, would, he believed, exceed that cost, despite the fact that they were only erections of a temporary character. Moreover, they were not even movable in the ordinary sense of the word, because they had permanent foundations and a permanent roof; it was only the walls that could be taken to pieces and removed. For what reason had the Leith Board gone abroad? He did not think anyone present could answer that question. They had not gone for economy, the speaker contended. It seemed to him absurd that the Board should have gone abroad for these buildings when they could have been erected more cheaply by British contractors, more especially when there was such a great deal of stagnation in the trade. The Board was, in fact, going in for the feeding of school children, while at the same time they were depriving the parents of the means of keeping their bodies and souls together. The foundations of the buildings, he might mention, would be put in by local firms, but the construction would be supervised by Germans. There was absolutely no valid reason for the Board's action, and he thought that they, as a trade, should enter a very strong protest.

Mr. Mekie, chairman of the Master Builders' Association, stated that 40 per cent. of the money to be employed on the buildings was going abroad, which represented a very large sum to be spent in a foreign country, when it could have been spent to a better advantage at home, and benefited artisans sorely in need of work.

Mr. J. R. Watson said that the same kind of buildings could have been erected by British workmen, and it seemed that if Leith School Board were going to indulge in schemes of this kind, the Government should make them pay for the privilege. There was nothing difficult in the building construction; in fact, similar buildings were put up daily excepting the fact that the walls were not lined with the Doeker material.

Mr. W. Melrose, builder, Leith, thought that the bricks to be utilised for the floors might have been sufficient to build a school themselves. He stated that the boundary walls are to be of finely dressed rubble work on both sides, with about 1,000 ft. of dressed cope. There were also several hundred brick piers to carry the floors, and the cost of these items alone would amount to about £2,000. He went on to say that the schools were bought some time ago, and he was surprised that the Board had succeeded in getting the scheme passed by the Leith Dean of Guild Court.

Councillor A. A. Murray afterwards moved the following resolution, namely: "That this meeting of the Edinburgh, Leith and District Building Trades Association, and the Building Trades Exchange of the City and District of Edinburgh, protests against the action of the Leith School Board in going abroad for any contracts for the erection of the two schools presently being erected for them, without giving local (or even British) contractors an opportunity of tendering for same. It is further of opinion that such action is detrimental generally to the interests of the building trades in the Edinburgh and Leith district, and of the ratepayers in particular, as the cost is believed to be greater than that at which they could have obtained ordinary permanent buildings. This meeting further resolves to send copies of this protest to the Leith School Board, and to the Scotch Education Department." In moving the resolution, Councillor Murray said that it seemed absolute nonsense for distress committees to be organised and then wages to such a large sum sent out of the country, and the ratepayers paying the piper all the time. It was a very grave matter for those interested in the building trades, and the Board's action had been most unfortunate. It was absolutely undreamt of that any German material should come across the water for a school for even temporary purposes. He failed to un-



COTTAGES ON THE NORTH FELTHAM ESTATE, FELTHAM, MIDDLESEX. ALBERT C. NOTLEY, ARCHITECT.

These cottages are faced with red bricks up to the string course, and above this the walls are rough-casted. The roofs are covered with sand-faced tiles and the internal partitions are brick built throughout.

derstand how the scheme had ever been passed by the department. He thought that the meeting had made out a good case for protest against the action of the Leith School Board. He wanted to know why the School Board had gone abroad at all. It could not be because of hurry, as local builders could have put up permanent buildings in as quick a time. The Board, he thought, had jumped to the conclusion to have these brand-new made-in-Germany buildings put down in Leith without considering the local tradesmen or local contractors.

Mr. J. R. Watson, Leith, seconded the resolution, which was carried unanimously.

The staff annual dinner of the Expanded Metal Company, Ltd., was held on Friday evening last, at the York Restaurant. Mr. Fredk. Purton, the manager of the company, presided over a large gathering of the staff, and among the guests were Mr. R. R. Walker, Mr. Chalmers, and Mr. Fruen, of Messrs. Wm. Jacks and Co., Mr. Hughes, of Messrs. A. G. Kidston and Co., and Mr. Cranmer. An interesting musical programme was provided by Messrs. Purton, Jenkins, Holt, and Cranmer, while the humorous element was well represented by two talented junior members of the staff, Messrs. Rowley and Ferneyhough.

* * *

An interesting archæological collection belonging to Mr. John Ford, Deputy Lieutenant of the County of Middlesex, was offered for sale on November 16th, at Old Park, Enfield, by Messrs. Knight, Frank and Rutley. The house is one of the few fine specimens remaining near London of the Queen Anne period, and the owner, who is a well-known Fellow of the Society of Antiquaries, has, during a long career, collected the specimens which are about to be dispersed. The gardens at Old Park contain some ancient life-sized lead figures and marble vases such as are rarely found, except in the pleasaunce of a great mansion like Chatsworth or Trentham. Stone ornaments, designed by Sir Christopher Wren, and removed from two of his famous City churches, are to be found here, and palisading from the Old South Sea House, rare old iron gates and marble vases from the old palace at Theobalds Park, a sundial formerly belonging to Sir Hugh Myddelton, and stonework originally on Burlington House, Piccadilly. Old English silver and pewter, porcelain of the various Chinese dynasties, Greek and Roman glass and pottery, rare Persian rugs, and furniture by the old English cabinet-makers from Charles II. down to the time of the Georges, were included in the sale.

ELECTRICITY IN BUILDINGS.
VII.

By Harold Hastings, M.I.E.E., A.M.Inst., C.E.

(Concluded from page 568, No. 749).

Typical Installation Work.

We have put before our readers the theoretical consideration of electricity; the nature of an electric current; the apparatus required for transmitting it in any desired course; and the means of utilising it when it has been conveyed to the required spot.

We have, therefore, all the materials for building up a concrete case. Let us assume a fairly simple example, prepare a schedule of quantities, and proceed to discuss each portion of the work in detail. The plan shall be as shown in Fig. 33, and we will treat it in the alternative ways suggested in the preceding articles.

Before starting to take measurements there are three things to do—(1) call upon the Supply Co. to fix their point of entry and to indicate the positions of their main cut-out and meter (they have the right to choose any reasonable position that they may think fit); (2) fix the position of the distribution-board; (3) make a list of the requirements, taking notes of the apparatus wanted in each room and marking the positions of lamps, switches, etc., on a plan after the style of that to be given later.

The Supply Co.'s main cut-out forms the line of demarcation between the internal wiring and the external cable. The wiring contractor has to provide everything from this point inwards except the meter, and he has to furnish the cables for connecting to the meter.

The order of apparatus at the entrance is, Supply Co.'s main cut-out, meter, consumer's main switch, consumer's single-pole main cut-outs. Thence the cables go direct to the distribution-board from which the circuits radiate. If the tree system is employed the cables run from the consumer's main cut-outs straight up the building.

In the case under consideration, we have assumed the point of entry to be in the front of the house, facing the cellar stairs. The cable turns horizontally towards the wine cellar and immediately enters the Supply Co.'s main cut-out. The meter is placed a foot nearer the wine cellar. The height of the cables is 3ft. below the ceiling.

It will be found that the Supply Co.'s men will come and lay the service to the point determined, shortly after the first visit. They will fix the cut-out and connect their cable into it. They will then leave the cut-out sealed up until advised that the installation is nearly completed. The meter will most probably be fixed a day or two before the contractor is ready for current to be switched on. Finally, they will come and unseal the cut-out and then connect the contractor's wires into it.

Before giving a supply they test the installation with all lamps and other apparatus in position, both between poles and from each pole to earth. The engineer examines the whole installation from top to bottom to see that it has been carried out in accordance with the company's requirements.

The contractor can find out exactly what these requirements are before starting the work by applying for a book of rules. Every precaution must be taken to ensure a satisfactory test before the engineer is asked to come. Companies make a point of charging for each test after the first (which is always free). The usual charge is 10s. 6d. But apart from the monetary consideration it is very unpleasant to have to explain to the would-be consumer why he is unable to consume.

The most convenient spot for the distribution-board appears to be the corner in the hall, outside the housemaid's pantry. It will be fixed 5ft. from the floor level as this is a suitable height for manipulating the fuses.

The best way to make a list of requirements is to begin at the top of the house and make very full notes regarding each room as given below. At the same time the walls should be marked, and a small cross pencilled or chalked on them to indicate the position of the switches, brackets, etc.

Bedroom No. 1.—A 3-light pendant will be placed in the centre of the room, with 2 switches at the door. Two counter-weight pendants are wanted by the dressing-table, controlled by one switch close at hand. A wall-plug will go at the side of the bed, for a reading-lamp, and another by the fireplace, for a curling-iron heater or other accessory. We can assume the two wall-plugs to be 16 c.p. each, and the rest of the lamps 8 c.p.

Bedroom No. 2.—Two plain pendants are sufficient for this room, with one controlled from the door and the other from the side of the bed. Both will have 8 c.p. lamps.

Boxroom.—One plain 8 c.p. pendant, with the switch by the door.

Bedroom No. 3.—Two plain 8 c.p. pendants, with one switch at the door and one near the bed.

Bedroom No. 4.—One bracket lamp near the bed, with a switch underneath it, and one pendant lamp over the dressing-table, with the switch at the door. Both of these 8 c.p.

Landing and Stairs.—One 8 c.p. pendant is required over the stairs, with two 2-way switches controlling it, wired so that it can be lighted from the bottom of the stairs, or from the top. This completes the second floor.

Bedroom No. 5.—Another three-light pendant will be suitable here, with two switches. Four wall-plugs for a nominal 16 c.p. each will prove adaptable for table lamps or brackets fitted to hang from the picture moulding.

Dressing-room.—Two 8 c.p. pendants, with one switch at each door, and a wall-plug (16 c.p.) will satisfy this room.

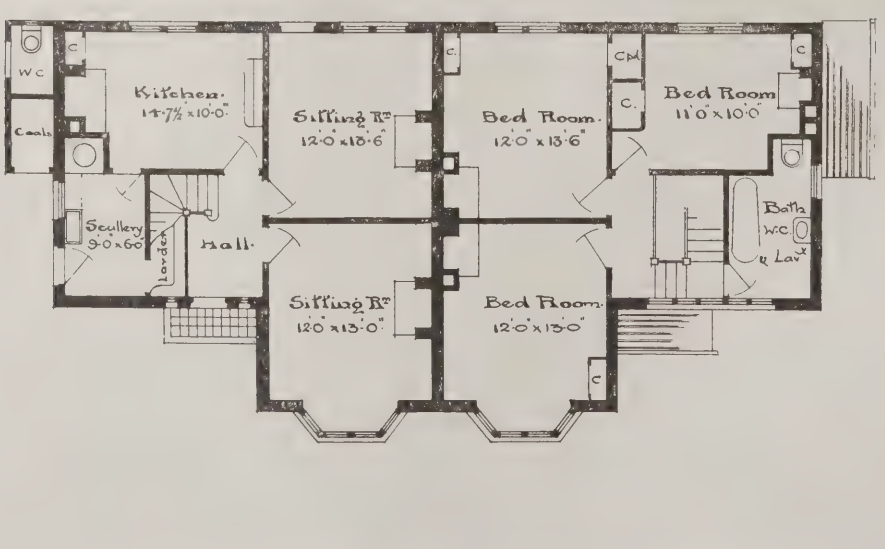
Bathroom.—One pendant for 8 c.p. should be placed over the bath and a wall-plug for a radiator (say 16 c.p. for the present).

Water-closet.—One 8 c.p. pendant with the switch at the door.

Bedroom No. 6.—Two three-light fittings and four wall-plugs will illuminate this room well. The wall-plugs will be reckoned as 16 c.p. and the other lamps as 8 c.p. The switches for the fittings will be placed for one at the doorway, and for the other close at hand. They will have two switches each.

Dressing-room.—Two pendants and one wall-plug will be enough, arranged as in the other dressing-room.

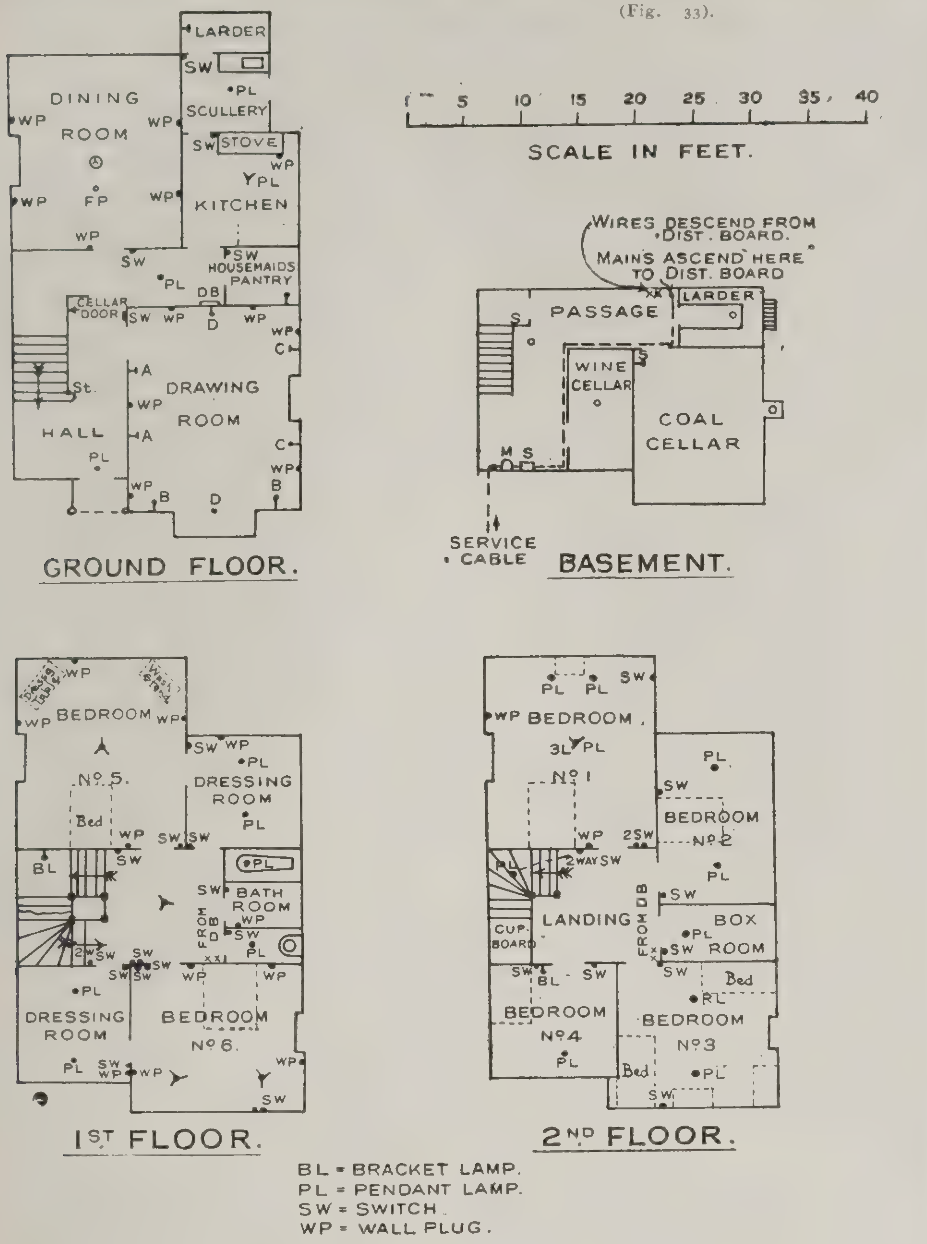
Landing.—One three-light 8 c.p. fitting with two switches.



Ground Floor Plan. First Floor Plan.

COTTAGES, NORTH FELTHAM ESTATE, FELTHAM, MIDDLESEX. ALBERT C. NOTLEY, ARCHITECT.
The cost including fencing, gates, gardens and all other expenses worked out at 6d. per foot cube.
Mr. A. Emmett was the builder.

(Fig. 33).



Stairs.—A bracket at the corner with two 2-way switches will be ample, but in this case a 16 c.p. should be used.

Dining-room.—In this room a counterweight fitting for three lights is required over the table. This will have a heavy shade and can concentrate its light on the table. Around the room five wall-plugs can be placed, to which standard lamps can be connected, should the room at any time be used as a supper-room for a dance. A floor-plug should be let in, level with the floor and under the table, for making connection to table lamps. The two switches for the centre fitting should be near the door, arranged to light one lamp with one switch and two with the other. The floor-plug should also be controlled by a switch. It may be found convenient to place these three switches just outside the door in the hall.

Kitchen.—A three-light counterweight fitting with two switches at the doorway, will be placed over the table. In addition to this, a wall-plug by the side of the stove will be found very handy. A hand-lamp can be attached to this, to enable the cook to examine things in the oven without the necessity of pulling them out into the light.

Scullery.—One lamp should suffice, with the switch at the kitchen door.

Larder.—One bracket can be placed here, with a switch underneath.

Housemaid's Pantry.—One bracket and switch is enough.

Drawing-room.—In this case we have placed 7 brackets round the room and one pendant in the bay-window, also there are 6 wall-plugs. The last are most useful in a drawing-room as they will be found very convenient for connecting standard lamps. It will be as well to assume that all the points in this room are to have 16 c.p. lamps. The switches can be neatly arranged outside the door in the hall. One switch should control a pair of lamps, and they can be arranged so that the lamps marked AA, BB, CC, DD can be lighted together.

Hall.—A newel standard is very effective, having a switch at its base. A pendant over the door and another round the corner should suffice. All these should be 16 c.p. lamps.

Cellars.—A switch at the top of the cellar stairs is most necessary. It can control a lamp placed at the corner of the passage close up to the ceiling. This will light the stairs and the passage in each direction. Lamps are also placed in the wine cellar, coal cellar, and the larder, with their switches at the doors of each place.

These notes can now be summarised in the form of table G, see p. 378.

The next thing to do is to divide the system into circuits. The fuses in a distribution-board are supposed to carry about five amperes, but it is wiser to keep well below this to allow for small additions and for changing some of the 8 c.p. lamps for 16 c.p. as occasion demands. We will, therefore, try to approximate 4 amperes on each circuit.

The lamps are first divided into floors, remembering that pendants are wired from the floor above and wall-plugs from one on which the room in which they are placed is situate. For example, the wall-plugs in bedroom No. 1 will be wired from the same circuit as the three-light pendant in bedroom No. 5.

It is seen that the whole installation involves an equivalent to 123·8 c.p. lamps. If these are taken at 33 watts per lamp they represent 4,059 watts. As the system is assumed to be a 200-volt one, the watts divided by 200 will give the amperes, 4,059 divided by 200 equals 20.3 nearly.

As we are arranging to supply 3 to 4 amperes on each circuit and the total is 20.3, there will be 5 or 6 circuits. Assuming that the greater number is correct, as it is easy afterwards to combine two circuits under one fuse, we can prepare a second schedule showing which lamps are connected to each circuit.

It is unnecessary to make a diagram of the wiring of each part of the house. The system to be followed is a very simple one. The two wires, which emanate from the distribution-board, may be distinguished by the terms "switch-wire" and "lamp-wire." It is a rule in all installation work that all the switches shall be connected to the same pole. This rule indicates the system to be followed. The system is, first, that all the switches are to be connected together by looping the wire in and out of one terminal and then on to the next lamp. Second, the remaining terminal of each switch is to be connected to the lamp, or lamps, that it is to control. Third, the lamp wire is to be connected to all lamps by looping in and out of the free terminals.

It is not important to make these connections in rotation, but they may be made as is most convenient; that is, if the switch-wire from the distribution-board is first taken to the bathroom switch, it is not necessary to take the lamp wire to the bathroom lamp first, it may go to the other end of the circuit if more convenient.

When a switch controls more than one lamp the others are coupled to the first in parallel. Coupling in parallel has already been explained in the first section. It consists of joining together the terminals.

Wall-plugs which are not controlled by a switch are treated both as lamps and switches, that is, the lamp-wire diverts into it, as it passes from lamp to lamp, and the switch-wire does the same, as it, too, passes from switch to switch. By wiring on this method it is quite unnecessary to have any joints at all. But it must be remembered that looping consists only of taking a wire into and out of the same terminal. If once the looped wire is taken into one terminal and out of the other the whole system will be upset.

The size of the wires must next engage our attention. Taking the switch-wire first, it is clear that the length between the board and A, has to carry the current of the whole circuit. The length AB has one lamp less. The length BC carries current for three lamps less than the total number. Thus, we can proceed through the whole circuit. Theoretically, we could make a reduction in the size of wire each time a branch is taken off, but these would be in such infinitesimal steps, that it would be quite impractical. In the case in point, assuming that all the lamps and plugs are 8 c.p. at 200 volts, the total watts are 350, so the total amperes are 350 divided 200 equal 1.7 amperes. A single 18 wire will carry this easily. But supposing there is a restriction that the drop may not exceed 3 volts and that the distance from the board to A is 100yds., then the drop on a No. 18 would be nearly 5 volts, because there would be 200yds. of wire, and it is loaded up to nearly 1,000 amperes per sq. in. A single No. 16, therefore, would have to be used, and as the loss would be 5 volts in 200yds. of wire with

TABLE F.

Rooms.	Fittings.	Circuit VI. — Wiring placed between flooring of ground floor and ceiling of cellars, *front* half of house.	Circuit V. — Wiring placed under flooring of ground floor, *back* half of house.	Circuit IV. — Wiring placed between flooring of first floor and ceiling of ground floor, *front* half of house.	Circuit III. — Wiring placed between the flooring of first floor and ceiling of ground floor, back half of house.	Circuit II. — Wiring placed between the flooring of second floor and ceiling of first floor.	Circuit I.—Wiring placed under the roof, above the ceilings over second floor.
		Equivalent in 8 c.p. lamps.					
Bedroom No. 1	1 3-light pendant	—	—	—	—	—	3
	2 counterweight pendants	—	—	—	—	—	2
	2 wall plugs	—	—	—	—	4	—
Bedroom No. 2	2 plain pendants	—	—	—	—	—	2
Boxroom	1 ,, ,,	—	—	—	—	—	1
Bedroom No. 3	2 ,, ,,	—	—	—	—	—	2
Bedroom No. 4	1 single-light bracket	—	—	—	—	—	1
	1 plain pendant	—	—	—	—	—	1
Landing & stairs	1 ,, ,,	—	—	—	—	—	1
Bedroom No. 5	1 3-light pendant	—	—	—	—	3	—
	4 wall plugs	—	—	—	8	—	—
Dressing-room	2 plain pendants	—	—	—	—	2	—
	1 wall plug	—	—	—	2	—	—
Bath-room	1 plain pendant	—	—	—	—	1	—
	1 wall plug	—	—	—	2	—	—
Water closet	1 plain pendant	—	—	—	—	1	—
Bedroom No. 6	2 3-light pendants	—	—	—	—	6	—
	4 wall plugs	—	—	8	—	—	—
Dressing-room	2 plain pendants	—	—	—	—	2	—
	1 wall plug	—	—	2	—	—	—
Landing	1 3-light pendant	—	—	—	—	3	—
Stairs	1 plain bracket	—	—	—	—	2	—
Dining-room	1 counterweight 3-lt. fitting	—	—	—	6	—	—
	5 wall plugs	—	10	—	—	—	—
	1 floor plug	—	2	—	—	—	—
Kitchen	1 counterweight 3-lt. fitting	—	—	—	3	—	—
	1 wall plug	—	2	—	—	—	—
Scullery	1 plain pendant	—	—	—	1	—	—
Larder	1 bracket	—	—	—	1	—	—
Housemaid's Pantry	1 ,,	—	—	—	1	—	—
Drawing-room	7 brackets	—	—	14	—	—	—
	1 pendant	—	—	2	—	—	—
	6 wall plugs	12	—	—	—	—	—
Hall	1 newel standard	2	—	—	—	—	—
	2 pendants	—	—	2	2	—	—
Cellars	4 ,,	4	—	—	—	—	—
Total Amp. = 20.295	Equivalent 8 c.p. lamps =	18	14	28	26	24	13
	Multiply by 33 to find wt. =	594	462	924	858	792	429
	Divide by 200 to find amps. =	2.97	2.31	4.62	4.29	3.96	2.145

3.18 amperes, with 1.75 amperes it will be less, in strict proportion, thus—5 × 1.75 ÷ 3.18 = 2.75 volts.

The wires which connect the switches to the lamps which they control, have only to carry the current necessary for the lamps in question.

Now that the principle has been fully explained we can apply it to the installation which we have assumed.

Circuit No. 1 has at total current of 2.145 amperes, so that a No. 18 will carry the current easily. As this is the smallest size of wire which it is advisable to use, the whole circuit will be wired with this size. The run of the wires is a direct one from the board to the first switch and lamp. It will be, say, 7ft. to the ceiling of the ground floor, 11ft. to the ceiling of the first floor, and 9ft. to the ceiling of the second floor; thence 6ft. to the nearest switch and lamp, making a total distance of 33ft., or 11yds. As there are two wires, their total length will be 22yds. By simple proportion we can find the drop in volts, for it is known that 100yds. of No. 18 wire gives a drop of 2.5 volts with 1.8 amperes, so that 22yds. will give .25 drop and 22yds. with 2.145 amperes will give a drop of .66 volts, which is very moderate.

By scaling from the plan the distances from lamp to lamp, and from switch to switch, and allowing for a loop at each switch to within 4ft. from the floor level, we find that a total length of 50yds. of switch wires, 30yds. of lamp-wires, and 46yds. of wires between the switches and the lamps is required. This makes a total length of wire on the top floor of 126yds. The maximum drop on the circuit may be taken as half the greatest distance from the first lamp and switch to the farthest, and due to half the number of lamps connected along this distance. If the lamps were tapped off at equal intervals the result would be theoretically correct. The method, therefore, is sufficiently approximate for all practical purposes.

In the present case the greatest distance is from the boxroom to the bedroom No. 1, and amounts, when measured on the plan, to 34yds., allowing as before for the loops to the switches. Half this distance with two wires will still give 34yds. of wire. There are 8 lamps connected to this run, so that the drop will be taken on 4.

Four lamps take .7 amperes, and the drop on a No. 18 in 34yds. will be .33 volts. This amount added to the drop in the leads from the distribution-board to the first lamp and switch, namely, .66, gives a maximum drop of, say, 1 volt, which is very low.

The other floors can be dealt with in exactly the same manner, remembering that in these cases the wires not only descend to

TABLE G.

Rooms.	Fittings.	Lamps.		Equivalent In 8 c.p. lamps.	Ordinary Switches.	2-way Switches.	Ceiling Roses.	Round base bloeks for switches and Roses.	Square base bloeks for several Switches.	Length of flexible required in yards.
		8 c.p.	16 c.p.							
Bedroom No. 1	1 3-light pendant	3	—	3	2	—	1	1	1 for 2 sw.	4
	2 counterweight pendants	2	—	2	1	—	2	3	—	10
	2 wall p ugs	—	2	4	—	—	—	—	—	6
Bedroom No. 2	2 plain pendants	2	—	2	2	—	2	4	—	4
Boxroom	1 ,, ,,	1	—	1	1	—	1	2	—	2
Bedroom No. 3	2 ,, ,,	2	—	2	2	—	2	4	—	4
Bedroom No. 4	1 single-light bracket	1	—	1	1	—	—	1	—	—
	1 plain pendant	1	—	1	1	—	1	2	—	2
Landing & Stairs	1 ,, ,,	1	—	1	—	2	1	3	—	2
Bedroom No. 5	1 3-light pendant	3	—	3	2	—	1	1	1 for 2 sw.	4
	4 wall plugs	—	4	8	—	—	—	—	—	12
Dressing-room	2 plain pendants	2	—	2	2	—	2	4	—	4
	1 wall plug	—	1	2	—	—	—	—	—	3
Bath-room	1 plain pendant	1	—	1	1	—	1	2	—	2
	1 wall plug	—	1	2	—	—	—	—	—	3
Water closet	1 plain pendant	1	—	1	1	—	1	2	—	2
Bedroom No. 6	2 3-light pendants	6	—	6	4	—	2	2	2 for 2 sw.	8
	4 wall plugs	—	4	8	—	—	—	—	—	12
Dressing-room	2 plain pendants	2	—	2	2	—	2	4	—	4
	1 wall plug	—	1	2	—	—	—	—	—	3
Landing	1 3-light fitting	3	—	3	2	—	1	1	1 for 2 sw.	4
Stairs	1 plain bracket	—	1	2	—	2	—	2	—	5
Dining-room	1 counterweight 3-light fitting	—	3	6	2	—	1	1	1 for 3 sw.	supplied with fitting
	5 wall plugs	—	5	10	—	—	—	—		15
	1 floor plug	—	1	2	1	—	—	—		2
Kitchen	1 counterweight 3-light fitting	3	—	3	2	—	1	1	1 for 2 sw.	6
	1 wall plug	—	1	2	—	—	—	—	—	3
Scullery	1 plain pendant	1	—	1	1	—	1	2	—	2
Larder	1 plain bracket	1	—	1	1	—	—	1	—	—
Housemaids' pantry	1 ditto	1	—	1	1	—	—	1	—	—
Drawing-room	7 single-light brackets	—	7	14	4	—	—	—	1 for 4 sw.	—
	1 pendant	—	1	2		—	1	1	—	2
	6 wall plugs	—	6	12	—	—	—	—	—	18
Hall	1 Newel standard	—	1	2	1	—	—	1	—	—
	2 pendants	—	2	4	2	—	2	4	—	4
Cellars	4 plain pendants	4	—	4	4	—	4	8	—	4
	Totals	41	41	123	43	4	30	58	6 for 2 way 1 fo 1 way 1 for 4 way	156 yards

the switches, but also rise to the wall-plugs of the floor above. It is scarcely necessary to do more than indicate the sizes of the wires in each case. They can be determined at sight.

Circuit Nos. 1, 5, and 6 need single No. 18 throughout, and the other three No. 16 as far as the first switch and lamp, and No. 18 elsewhere. The main cable entering the house will have to be of 7-16 strand.

As two wires go in the casing or tubing in nearly all the runs, the quantity required can be safely assumed to be 20 per cent. more than half the length of each size of wire. The casing must, of course, be of the size suitable for the wire in question, and can be determined from the tables already given.

The quantity of wire will be 38yds. of No. 16 and 684yds. of No. 18, as shown on the following table:—

TABLE H.

	From distribution board to first switch and lamp.	Wire connecting all switches.	Wire connecting all lamps.	Wires between switches and lamps.	Totals.	
					No. 16	No. 18
Circuit I ..	22	50	30	46	—	148
,, II ..	16*	65	30	70	16	165
,, III..	8*	40	30	44	8	114
,, IV ..	14*	—	32	74	14	120
,, V ..	12	22	22	All WP	—	56
,, VI ..	8	28	39	6	—	81
*These are No. 16 guage.					38	684

It is now a simple matter to summarise the various tables in the form of a schedule of quantities, as follows:—

Schedule of Quantities.

1	25-amp. main double-pole switch in lock-up case.
2	single-pole main cut-outs, for 25 amperes.
1	six-way distribution board, 5 amperes per way.
26	yds. $\frac{7}{16}$s. Association, 600 meg. grade 200-volt cable.
13	yds. $2\frac{3}{4}$in. wide wood casing or $1\frac{1}{4}$in. heavy gauge brazed and screwed steel tubing.
648	yds. No. 18 Association 600 meg. grade wire.
38	yds. No. 16 do. do. do.
324	yds. $1\frac{1}{8}$in. wood casing or $\frac{5}{8}$in. steel tubing.
19	yds. $1\frac{1}{2}$in. wood casing or $\frac{1}{2}$in. steel tubing. (If tubing used include bends, elbows, inspection boxes, &c.)
156	yds. flexible cord, for pendants.
43	"Tumbler" switches.
4	2-way "Tumbler" switches.
30	ceiling roses.
58	round base blocks for roses and switches.
6	base blocks for two switches.
1	do. three do.
1	do. four do.
5	3-light pendant fittings with cord grips
2	counter-weight pendants for 1 lamp.
25	wall sockets and plugs.
1	floor plug.
2	counter-weight 3-light fittings -(p.c. price for 1).
1	Newel standard. (Allow p.c. price.)
7	1-light brackets, ornamental design. (Allow p.c. price).
4	plain brackets.
23	lamp-holders, with shade-rings and cord-grips bayonet socket, for 200-volt system.
33	lamp-holders, with shade-rings and bayonet socket, no cord-grips, but $\frac{1}{4}$in. thread.
41	8-c.p. lamps for bayonet socket.
41	16-c.p. do.
50	shades to choice. (Allow p.c. price.) Screws, jointing materials, &c.

If the tree system had been employed, the circuits would have been wired in the same manner. The whole installation would have been scheduled in the same way, with the following alterations:—

(1) The distribution board would have been replaced with six single pole 5 ampere cut-outs, mounted in pairs on base-boards.

(2) About 28yds. run of two single wires in casing or tubing would have been replaced by 8yds. run of two 7-16 cables in its corresponding casing or tubing.

(3) At least 4 joints would have been made in the 7-16 cable.

A small amount of money would have been saved on items (1) and (2), but item (3) more than counterbalances this, both as regards expense and also soundness of work. It is most desirable to avoid joints as far as possible.

As before pointed out, it is of great advantage to have all the fuses concentrated in one position, rather than scattered broadcast about the building.

We have now considered every detail of a typical installation, and the one we have taken is a very common type. There is very little more to say regarding any class of house-wiring that may present itself. The same line of action is followed. The most adaptable system is chosen, whether it be tree or distribution-board, casing or tubing, or even a mixture of each.

If the total amperes exceed an amount which the Supply Co.'s rules fix and which is usually 25 amperes, then the "three-wire system" is employed. In such a case the only difference is that two complete installations have to be made instead of one, and the fuses and other apparatus of each system must be kept at least 6ft. apart. The loop for the metre has to be left on one wire of each system, and the diagram of connections at the point of entrance will be as shown in the figure. The two halves of the installation should be balanced as far as possible, not only as regards their total current, but also with respect to the uses to which the lamps, etc., are put. For example, a dwelling-house should have an equal number of bedrooms connected to each side, so that in all probability the same number of lamps on each half of the wiring will be consuming current at the same time.

We have avoided discussing any but the most popular and less experimental systems of wiring. The object that we have held in view throughout this series of papers has been to give the reader a sound basis upon which to build the details of any installation which may come in his way. With the aid of these remarks he should be able to design and carry out installation work, or, if he does not wish to do so himself, he should be able to see that the work is done for him in a proper and workmanlike manner.

Coming Events.

Wednesday, November 17.

Northern Architectural Association, Newcastle.—Students' Meeting. Mr. J. G. Smith on "Portland Cement Manufacture and Testing," 7.30.

Thursday, November 18.

Illuminating Engineering Society.—Opening meeting, at the premises of the Royal Society of Arts, 18, John Street, Adelphi, London, W. Inaugural Address, by Prof. Silvanus P. Thompson, D.Sc., F.R.S.

Friday, November 19.

Architectural Association, 18, Tufton Street, Westminster.—Mr. C. Reginald Enock, F.R.G.S., on "Architecture of the Incas of Peru," 7.30 p.m.

Institution of Mechanical Engineers, Storey's Gate, Westminster. — Ordinary General Meeting. Mr. Herbert A. Humphrey on "An Internal Combustion Pump, and other Applications of a New Principle," 8 p.m.

Saturday, November 20.

Junior Institution of Engineers.—Visit to Foundation Works, London County Hall, Belvedere Road, Lambeth, S.E., 3 p.m.

Royal Sanitary Institute, 90, Buckingham Palace Road, S.W.—Discussion, at Exchange Buildings, Nottingham, on "The Improvement of City Slums by Housing Reform and Otherwise," opened by Alderman T. J. Babell. (Afterwards, Visits to Housing Reform areas.)

Tuesday, November 23.

Ancient Architecture Lectures at the British Museum.—Mr. Banister Fletcher's 8th paper, "Origins and Evolution of the Doric Order," 4.30 p.m.

Wednesday, November 24.

Architectural Association.—Conversazione, 18, Tufton Street, S.W., 8 p.m.

Manchester Society of Architects.—Mr. P. M. Oliver, B.A., on "Ancient Lights."

Monday, November 29.

R.I.B.A.—Business Meeting.

Tuesday, November 30.

Manchester Society of Architects.—Students' Meeting. Mr. E. B. Norris on "Palladio of Vicenza and his School." Chairman: Professor Capper. 6.30 p.m.

Ancient Architecture Lectures at the British Museum.—Mr. Banister Fletcher's 9th paper, "The Parthenon, Athens," 4.30 p.m.

Monday, December 6.

Liverpool Architectural Society.—Mr. C. H. B. Quennell, F.R.I.B.A., on "The Development of Suburban Estates."

Tuesday, December 7.

Ancient Architecture Lectures at the British Museum.—Mr. Banister Fletcher's 10th paper, "Origin and Evolution of the Ionic Order," 4 p.m.

Institute of Sanitary Engineers.—Students' Meeting. Mr. A. J. Martin, M.Inst.C.E., on "Sewage Disposal," 7 p.m.

Wednesday, December 8.

Northern Architectural Association, Newcastle.—Council Meeting, 7 p.m. Ordinary Meeting: Mr. John W. Simpson, F.R.I.B.A., will read a paper, 7.30 p.m.

Royal Sanitary Institute, 90, Buckingham Palace Road, S.W.—Discussion on "The Collection and Disposal of House Refuse," opened by Mr. John S. Brodie, Borough Engineer, Blackpool, 8 p.m.

Manchester Society of Architects.—Mr. Henry Wilson on "Workmanship."

Friday, December 10.

Architectural Association.—Mr. F. C. Eden, on "Varallo, Orta, and Varese," 7.30 p.m.

Monday, December 13.

R.I.B.A.—Professor A. D. F. Hamlin, on "Architectural Education in America," 8 p.m.

Tuesday, December 14.

National Federation of Building Trade Employers.—Meeting of Administrative and Journal Committee.

Ancient Architecture Lectures at the British Museum.—Mr. Banister Fletcher's 11th paper, "Origin and Evolution of the Corinthian Order," 4.30 p.m.

Institute of Sanitary Engineers.—Students' Meeting. Mr. Geo. W. Chilvers, M.R.San.I., on "Practical Heating and Hot Water Supply to Buildings," 7 p.m.

Tuesday, December 21.

Ancient Architecture Lectures at the British Museum.—Mr. Banister Fletcher's 12th paper. Seventh and concluding lecture on "Greek Architecture." End of Michaelmas term. 4.30 p.m.

CONTRACTORS' TEMPORARY TACKLE.

By Hugh S. Cregeen, A.M.I.C.E., P.A.S.I.

The several useful expedients here described were employed on works with which the writer was connected.

In the repair of the brickwork of a railway tunnel which had become much decayed and unsafe, it became necessary to introduce new brickwork in many places, both in the sides and in the crown of the arch.

No particular difficulty was experienced with the side walls, which, with the aid of light trestles and planks, were necessarily within reach of the workmen. These trestles and planks could be easily removed on the approach of traffic, but the repair of the arch was a more difficult matter, and a staging had to be erected. This was constructed at a safe height above the traffic running beneath. In the brickwork, holes were cut sufficiently large for 12in. by 6in. timbers (or byats as they are called) to be inserted 4ft. apart centre to centre, on which 3in. planking was spiked, thus forming a platform for the men to work. On this stage, centering was fixed as shown in Fig. 1, and the brickwork was cut out and repaired in short lengths at a time.

Fig. 2 shows a cheap type of temporary covered way or passage, on the side of a

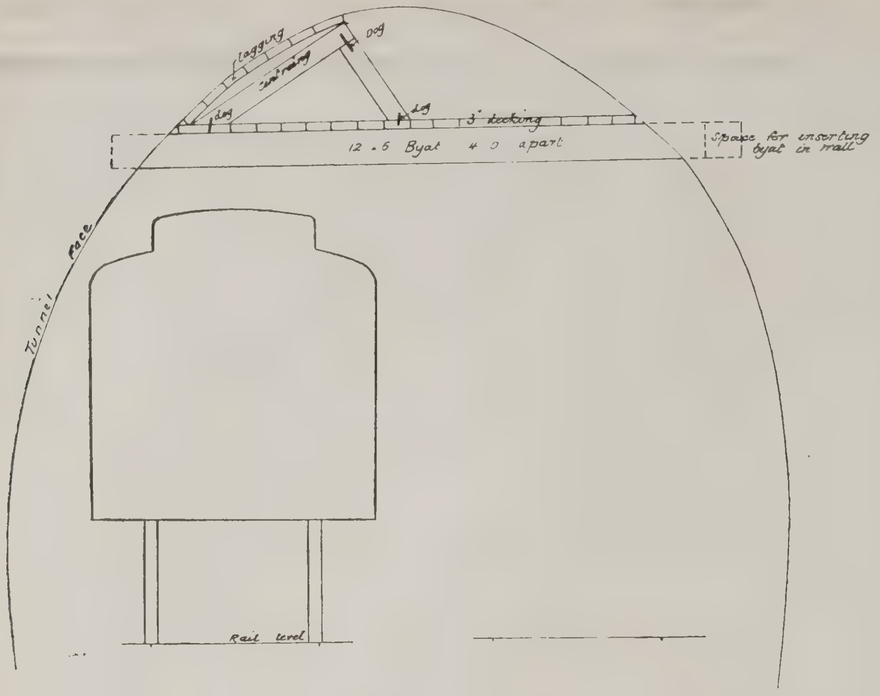


FIG 1.

REPAIRING BRICKWORK OF RAILWAY TUNNEL.

A platform for the workers was formed by placing in holes cut in the brickwork some 12 in. by 6 in. timbers, at 4 ft. centres, and spiking down 3 in, planking.

slope. It is constructed of old steel rail piles driven down into the solid ground, on which a curved portion, also made of rails, is bolted. These are fixed every 9ft. apart, and rail longitudinals connect them together and stiffen the structure.

The roof is formed of corrugated iron, while timber lagging fills in the sides as shown.

Fig 3 illustrates the timbering required in the process of carrying a sewer or large water pipe under the lines of a railway by means of trench work. Two whole timbers, 20ft. in length, are placed under the rails on 12in. × 12in. sole pieces, to support the line during the running of the trench and laying of the pipes.

After the pipes are laid, cement concrete is filled in 12ins. around the pipes, with 2ft. of lime concrete on top of this. In some cases where the trench is close to the sleepers in level, the concrete is carried right up to the latter.

It may be mentioned that the strength of a 12in. × 12in. timber over a trench, say 4ft. in width, would be as follows:—

Moment of resistance by 12×12 beam $= Zf$

$$= \frac{\frac{bd^3}{12}}{Y} f = \frac{\frac{12 \times 12^3}{12}}{6} \times \cdot 5 \text{ tons} = 144 \text{ inch tons.}$$

The bending moment is for a concentrated load $\frac{W.L. \times 12}{4}$, therefore BM=MRW will be obtained, and is found to be 12 tons for each wheel. The timber is therefore perfectly safe for loads up to this weight.

A staging is required temporarily to support a water tank 12ft. by 6ft. in size. Whole timbers, 12in. × 12in. are fixed, as shown in Fig. 4, to form uprights to which, similar sized heads and sills are connected, braced together with 9in. × 4in. pieces, the fastenings being 1in. bolts.

On the top of the stage 9in. × 3in. rafters are spiked down, and 6in. × 6in. timbers are laid across these, on which the tank is supported.

Ancaster House, now forming Nos. 59 and 60, Lincoln's Inn Fields, on the west side, are to be preserved. The house was originally built by Inigo Jones for the Earls of Lindsay. The house was divided into two so far back as 1750.

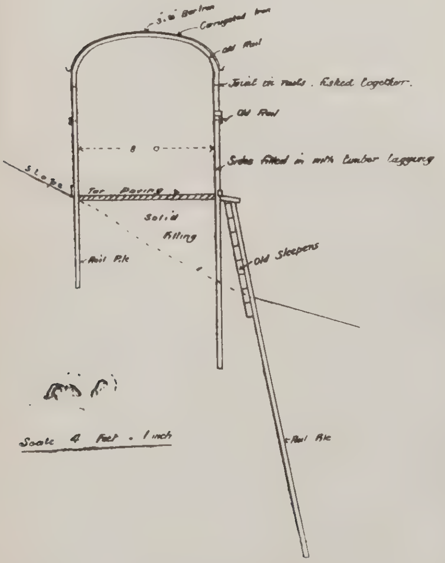


FIG. 2. TEMPORARY COVERED PASSAGE.

This is constructed of iron rails and covered with corrugated iron.

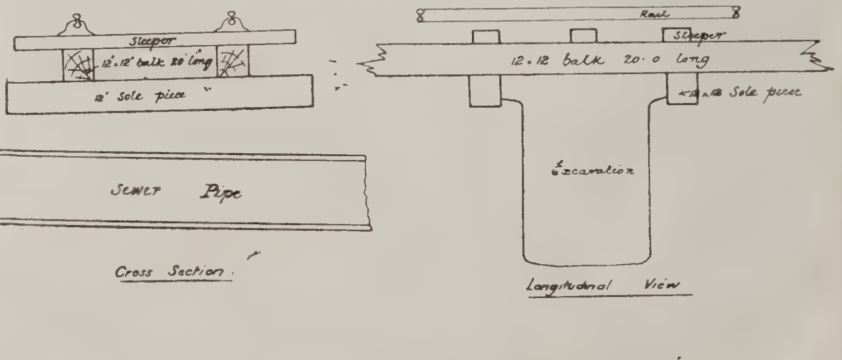


FIG. 3. CARRYING SEWER OR PIPE UNDER RAILWAY.

The timbering required in carrying a sewer or large water pipe under the lines of a railway is here shown.

Builders' Notes.

The Amended London Building Acts. The London Building Acts have become by repeated amendments as complicated as a will with many codicils. To the London Building Acts, 1894-1908, were added, last August, the amendments comprised in Part IV. of the London County Council (General Powers) Act, 1909, so that the correct title now is the "London Building Acts, 1894-1909." The amendments comprises sections 20 to 27, of which sections 22, 23, 25, and 26 are effective, the rest being formal or explanatory. Section 22 permits the use of skeleton framework. All rolled steel used in such construction shall comply with the British standard specification, and every pillar or girder shall be of iron or steel or any other structural metal which may hereafter be standardised by the Engineering Standards Committee.

Pillars and Girders. All pillars in external walls are to be completely enclosed and protected from the action of fire by a casing of brickwork or other incombustible materials at least 4ins. thick. Girders in external walls are to be similarly treated, but the casing on the underside and to the edges, flanges, plates, and angles may be of any thickness not less than 2ins. All pillars and girders in other positions must be encased to the satisfaction of the district surveyor, and to a thickness of not less than 2ins., but the casing on the upper surface of the upper flange of all girders and on the lower surface of all subsidiary joists may be of any thickness not less than 1in., and wood firrings are not to be used in connection with such casing; and the subsection making these provisions does not apply to buildings of only one storey and not more than 25ft. high. Whenever the length of a girder exceeds thirty times the width of the compression flange, the girder must be secured against buckling, and the web, whose depth exceeds sixty times its thickness, must also be secured against buckling. The span of a girder is

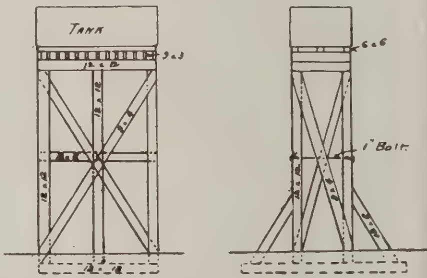
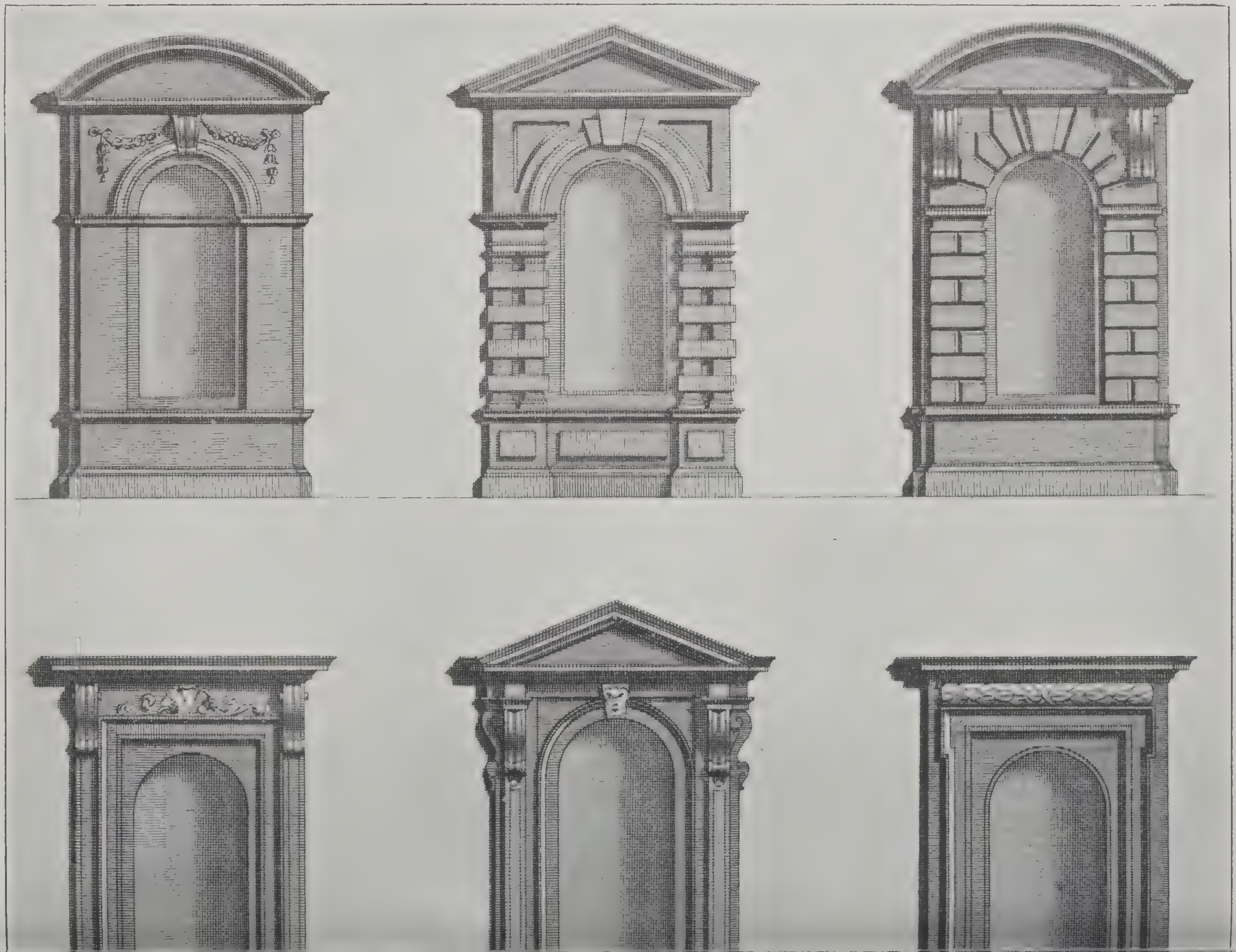
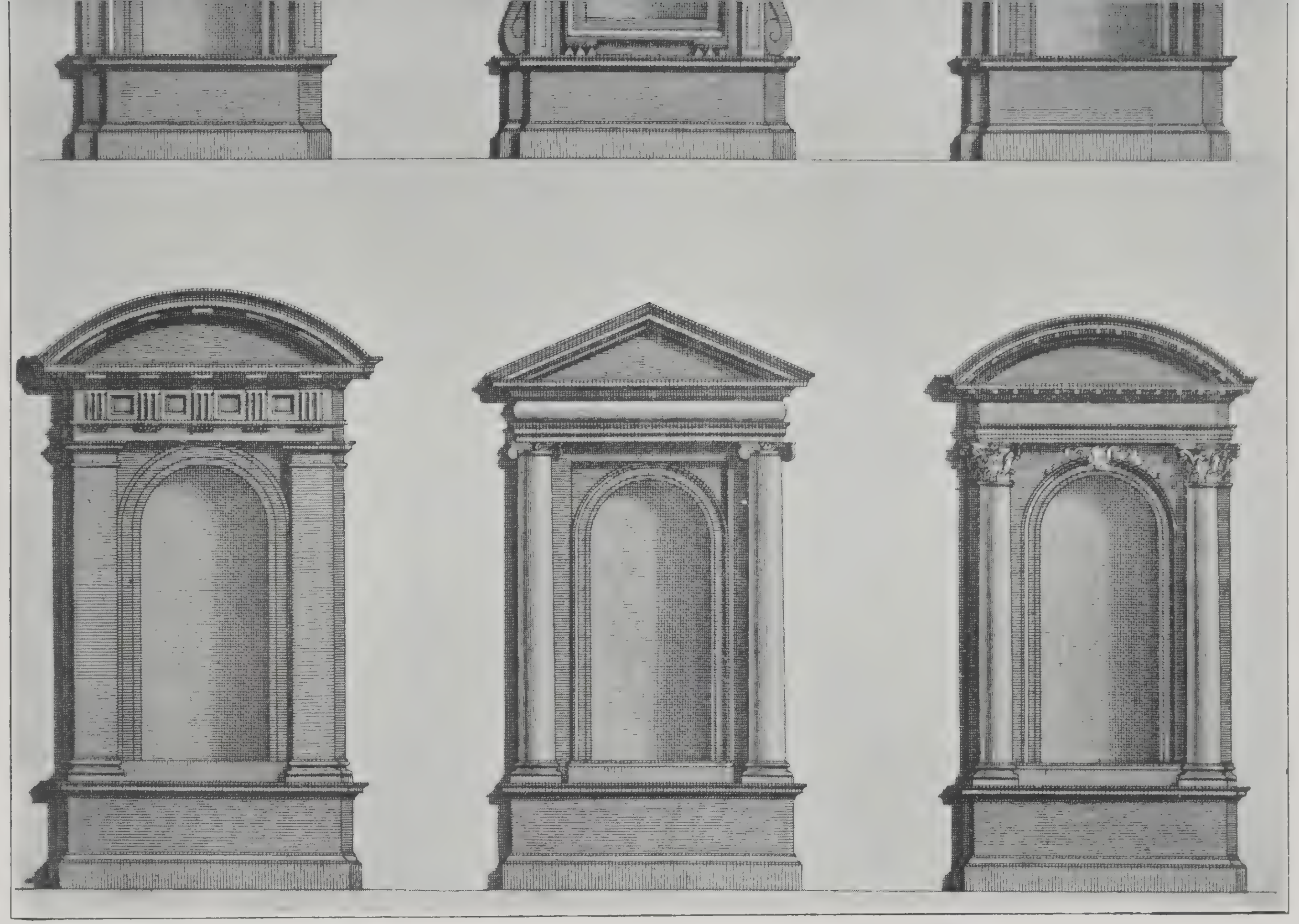


FIG. 4. STAGING TO SUPPORT WATER TANK.

The fastenings for the timbers are 1 in. bolts; and at the top of the stage 9 in. by 3 in, rafters are spiked down.





DESIGNS FOR NICHES. BY JAMES GIBBS.

not to exceed twenty-four times its depth, unless the calculated deflection is less than one-four-hundredth part of the span. Three sub-sections are devoted to the position and fixing of girders. As to walls, the chief item of interest is that an external wall supported by metal framework may be of any thickness not less than 8½ins. for the topmost 20ft. of its height, and 13ins. for the remainder of its height below such topmost 20ft.

Party Walls. All party walls must be of the thickness prescribed in the principal Acts. All brickwork and work in which terra-cotta, concrete, stone, tiles, or other similar materials are used shall be executed in Portland cement mortar of British standard specification, and shall be bedded close up to the metal framework without any intervening cavity, and all joints shall be made full and solid; but on party walls, except parts immediately surrounding metal framework, and in other internal brickwork that does not carry loads or stresses, lime mortar may be used. No plate or bar in any steel or wrought-iron pillar shall in any part be less than ¼in. thick, and the bases of all such pillars shall be at right angles to the axis. Pillars that are built up hollow must either be filled up with concrete or be covered in at both ends by metal plates. The dimensions, structure, and jointing of pillars are prescribed in detail; the loading of floors and roofs is particularised, and tables of working stresses have been drawn up. In section 23 the Council is empowered to make regulations with respect to the construction of buildings wholly or partly of reinforced concrete, and for the purpose of framing such regulations may carry out investigations and make tests.

Appeal and Fees. Section 25 varies the Tribunal of Appeal, by enacting that a member of the Institution of Civil Engineers shall sit with the other three members now constituting that body. Section 26 entitles the district surveyor to a fee equal to two and a-half times the amount specified in Part I. of the Third Schedule to the London Building Act, 1894. These, in outline, are the principal provisions of the new enactment. The full text forms Appendix VI. in Professor Banister Fletcher's edition of "The London Building Acts, 1894-1909," fourth edition, and is also issued separately, price sixpence net, by Mr. B. T. Batsford, 94, High Holborn.

Builders at Bay. It has been already recorded in this journal that the "speculative builders of Portsmouth," as they are called in the local Press, have been impelled by recent proceedings in the Town Council, to hold a meeting of protest, and to form an association for the defence of their interest. The builders seem to have taken umbrage at certain remarks made in the course of debate at Town Council meetings; and apparently they object to the closer supervision implied in a resolution proposed by Councillor Mactavish (but rejected) in the following terms: "That the Roads and Works Committee submit a monthly report to the Council, giving the number of houses in course of construction in the borough, the number of visits paid by our inspector, the number of samples taken for analysis, and the borough analyst's report." In moving the resolution, Councillor Mactavish disclaimed any reflection on the master builders of the town, who, he believed, were as a rule "as honest as a man could be in competitive business" (!); but he "also knew that there were others who were not so honest," and he claimed that his resolution was not only in the interests of the public, but it would also help to protect the genuine builder against the unfair competition of the shoddy builder. "If even a genuine builder found his prices continuously undercut by those with fewer scruples than himself, he was either compelled to adopt similar methods or go to the wall." In the circumstances, the last clause is an infelicitous figure of speech.

To Benefit Builders. By a similar rhetorical device, it is claimed that hunting is beneficial to the fox, who ought to be grateful for it; and in each contention there is a sufficient modicum of truth to lend speciousness to the theory. But the fox is not conspicuously thankful to the huntsmen and the hounds for his preservation, and his alleged enjoyment of the sport has never been authoritatively confirmed. Similarly, the builders would much rather be left to the protection of their own interests, and they are very decidedly of opinion that the hunting and worrying system so considerately prescribed for the benefit of their health would have the exactly opposite effect.

"Arrows of the Chase." At a largely-attended meeting of builders who considered that their interests were seriously involved, the chairman, Mr. A. Chase, whose name, if we may be pardoned the allusion, seems rather to harmonise with the fox-hunting parallel, warmly protested against the "dead set" which he declared had been made in the Council against the speculative builders of the town. He complained of unfair criticisms and unjust assertions, and said that a crisis had been consequently produced, because the speculative builder depended absolutely on finding purchasers for houses, and if the statements in the Council were believed, "houses would not be sold, credit would be stopped, finance would not be forthcoming, and mortgages would not be found."

A Matter of Mortar. That, again, is perhaps rather rhetorical. We get nearer to practical affairs in the contention that mortar that is to be subjected to the rigours of analysis ought to be either mixed by a chemist, or tested by an average of samples. The builders, Mr. Chase protested, tried to meet the public needs in a fair, just, and honourable way, and they demanded a fair, just, and efficient test. Other speakers having delivered themselves in much the same strain, it was resolved to form an Association of Speculative Builders, with Mr. A. Chase as president, Mr. M. Hart as secretary, and Mr. W A. Baily as treasurer.

Combination for Protection. Precisely why they should have thought it necessary to do this is not quite clearly evident from the available records. They resented, very naturally, the aspersions and insinuations levelled against them in the Council Chamber, where zeal for the public health and welfare is apt to wax prodigiously when polling-day is in sight; and they are probably justified in the fear that rigorous and remorseless application of stringent by-laws might here, as elsewhere, harass the builder to distraction without doing an atom of good to the public; but, in opposing sober common sense to perhaps fanatical zeal, was it necessary to form a special organisation? We should have thought the National Federation of Building Trades' Employers, of which there is a powerful association at Portsmouth, would have provided the necessary machinery for dealing with any attempt to persecute members of the industry.

When By-laws are Abused. It is necessary that by-laws should be strict; it is not necessary that they should be strictly enforced in defiance of everything but the letter of the law. It is necessary that they should represent a high standard; it is not necessary that merely technical infringement of that high standard should be remorselessly penalised in every detected instance. Whether the by-laws of any authority are interpreted and enforced in accordance with their spirit, or in accordance with their spirit, or in accordance with their letter, and whether or not they are used as an instrument for the public welfare or as an engine of persecution against the builder, depends very much on the tone and temper prevailing on any particular Council at any particular time; and the two most effectual ways of preserving the tone and temper sound and sane are to see that the industry is properly represented on it, and that the individual representation is properly supported by organised efforts.

Birmingham Builders' Report. The annual report of the Birmingham Building Trades Employers' Association, submitted at the annual meeting last Thursday, states that, in common with most trades in the city, the building trade during the last year has been in a very depressed state, and that there is at present no sign of a revival. The committee report that, as a result of the notices served on the operatives in November, 1908, uniformity of working hours in all trades has been secured. All the rules, except with the stonemasons, were settled by the local Conciliation Board. The masons pressed for the insertion of a rule prohibiting the introduction of worked stone into Birmingham, and as the employers were unwilling to accede to this, the matter was referred to the Midland Centre Conciliation Board, who decided the point against the masons. At the last annual meeting of the association the inter-trading rule was adopted, and as a result there had been a large increase in the number of members, the total now being 140, as compared with 84 at the end of last year. It having come to the knowledge of the committee that the question of revising the Birmingham building by-laws was under consideration, Mr. John J. Moffat, at the request of the committee, undertook to confer with the city surveyor and representatives of the Architectural Association and Surveyors' Institution on this subject. During the year the work of the association had been exceptionally heavy, involving the revision of the rules with all the operatives, the remodelling of the association rules, consequent upon the introduction of the inter-trading rule, and the introduction of the telephone card. With regret the committee reported that Mr. E. J. Bigwood, secretary for a period of twenty-five years, had found it necessary to resign his office owing to increasing pressure of other business. During his long term of office he had shown a devoted interest in the work of the association. The balance-sheet showed a balance of £45 3s. 6d. to the credit of the association.

Our Plate.

We give this week the last of our reproductions of designs by James Gibbs for various architectural details. Of the niches here shown those in the middle row will probably most commend themselves to the attention of readers. James Gibbs was born at Fittysmere, near Aberdeen, on December 26th, 1682, the second son of Peter Gibbs, a merchant. He was educated at Aberdeen Grammar School, and took his M.A. degree at Marischal College there. He studied architecture in Rome under Garroli and Carolo Fontana the younger. On his return to England about 1709, he became associated with Wren. His most famous buildings are the churches of St. Mary-le-Strand and St. Martin's-in-the-Fields, London, and the Radcliffe Library, Oxford.

The Budget Protest League states that builders and persons interested in the building and allied trades in the East of London have now fallen into line with their colleagues in the West, North-West, and North, and have issued a memorandum against the Budget. There are 38 signatories to the protest.

Societies and Institutions.

Society of Architects.

The Society of Architects held, on Monday, November 8th inst., at St. Bride's Institute, Fleet Street, E.C., a students' social evening, at which the presentation of prizes gained in competition was made. An exhibition of students' drawings and sketches was also held. The President, Mr. Geo. E. Bond, J.P., delivered a short address, and then made the following award of prizes:—Charles Hudson, a silver medal and a cheque value £25, for first position in the secondary school competition; G. L. Evans, prize value £10, for second position in the secondary school competition; D. H. H. Barry (first year student), and J. Pickup (second year student) were awarded the correspondence prizes, and Mr. J. T. Westbye obtained the prize value £3 3s. for the best series of sketches made during the year.

A demonstration of the working of the correspondence classes was then given; and afterwards a number of artistes gave an excellent musical entertainment.

Leeds and Yorkshire Architectural Society

The first general meeting of the winter session of Leeds and Yorkshire Architectural Society was held on Thursday evening, November 4th, at the Society's rooms, Park Street, Leeds. Several new members were admitted. The President, Mr. Percy Robinson, F.R.I.B.A., in the chair, announced the results of the Society's annual competitions, which, although lacking the keenness of previous years, had called forth work of a higher standard, the selection of sketches exhibited being particularly good. The prizes were awarded as follows:—Silver medal and President's prize for measured drawings to Mr. P. de Jong; prize for design, Mr. P. de Jong; for sketching, Mr. J. H. Farrar; for construction, Mr. J. H. Farrar; for essay, Mr. F. Satchard; Halden prize for testimonies of study, Mr. F. L. Kruckenberg. Sketching Club competition: For best set of studies of ancient buildings, Mr. G. H. Foggit; for best set of sketches, Mr. P. de Jong; for second best set of sketches (consolation prize), Mr. C. T. Whiteley. The remainder of the evening was occupied in an examination and criticism of the students' drawings by its members present. The annual smoking concert and distribution of prizes was held at the Queen's Hotel, Leeds, on Thursday evening, November 11th.

Glasgow Architectural Craftsmen's Society.

At a meeting of the Glasgow and West of Scotland Technical College Architectural Craftsmen's Society, Professor Charles Gourlay, B.Sc., A.R.I.B.A., delivered a lecture entitled, "The Building of a House." Beginning by defining building construction as the added sum of all the building crafts controlled as regards design by the master mind of the architect, the Professor proceeded to treat his subject on the basis of this definition. He pointed out how fundamentally necessary it was that the student should study at least one entire building to enable him to appreciate the many varied processes which are involved in the construction of buildings. To emphasise this view, he then showed a series of slides giving complete working drawings for a country house, in which as many different constructional details had been included as possible, while maintaining the unity of the design as a whole. In conclusion, he urged the importance of all architectural craftsmen pursuing a general course of this nature in building construction.—JOHN WILSON, Secretary.

Dr. Tristram, Chancellor of the Diocese of London, has decreed a faculty (subject to any objection that may arise with regard to disturbance of graves), permitting the execution of the scheme for the improved warming and ventilation of St. Paul's Cathedral.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Nov. 19.	SCHOOL FOR GIRLS, SALTBURN. Applications from architects for instructions prepared by Mr. Paul Waterhouse, the assessor in this competition, must reach The Secretary, North Riding Education Committee, Education Offices, County Hall, Northallerton, not later than the date named. The committee reserve the right of selecting and limiting the number of competitors.
Nov. 24.	GARDEN CITY PLAN, BURY. LANCS. In connection with the forthcoming exhibition of cottage designs in the Bury Art Gallery, the Bury Housing and Town-planning Association offer three prizes for a design for laying out a garden city suburb within the confines of the Borough of Bury. First prize £5; second prize £3; third prize £1 10s. Designs should be sent to H. Townend, Curator, Art Gallery, Bury, Lancashire.
Nov. 30.	HERNE BAY PAVILION ON PIER Herne Bay Urban District Council invite competitive drawings for a pavilion to be erected on the proposed extension of the pier at a total cost not exceeding £4,000, exclusive of architect's commission. Premiums of twenty-five guineas and ten guineas. Plan of the site and copy of the conditions may be obtained from J. Jubb, Clerk to the Council, Town Hall, Herne Bay. Deposit: on. guinea.
Nov. 30.	TECHNICAL AND SECONDARY SCHOOL, WORKINGTON. The Cumberland Education Committee invite architects to submit sketch plans with outline specification and estimate for a technical and secondary school in the Borough of Workington, Cumberland, for about 300 pupils of both sexes. Further particulars and conditions upon which plans will be received may be obtained from the undersigned on receipt of a stamped and addresse foolscap envelope and the payment of a deposit of one guinea. Deposi returned if all papers sent are returned within seven days. C. Courtenay Hodgson, Secretary, The Courts, Carlisle.
Dec. 1.	TRALEE. CARNEGIE LIBRARY AND TECHNICAL SCHOOL. Cost not to exceed £4,500. Premiums of £20 and £10 for design placed first and second by the assessor. Copies of instructions and conditions from the Town Clerk, Tralee.
Dec. 1.	PUBLIC PARK PLAN, BANGOR (COUNTY DOWN). The U.D. Council offer a premium of £30 for the best scheme for laying out a public park, twenty acres in extent. Premium to include all expenses of successful competitor, whose designs become the property of the Council. Schemes to J. Middleton, Town Clerk, Town Hall, Bangor, County Down.
Dec. 11.	MINEHEAD. SHELTER, with cloakroom and lavatories, on the Beach, the whole expense of which is not to exceed £3,000. Premium of £20. Plan of site and conditions from L. C. Webber-Incledon Clerk to U.D. Council, 16, Park Street, Minehead, Somerset.
Dec. 18.	TRAINING COLLEGE FOR TEACHERS, Kirkstall Grange, Far Headingly, Leeds. Architects practising in Leeds are invited to submit competitive designs for the above College. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed Assessor. Copies of the conditions of competition and instructions, a plan of each floor of the educational blocks and of the hostel blocks, also an estate plan, showing a suggestion for grouping the various buildings, may be obtained from James Graham, Secretary for Education, Education Department, Leeds. Designs to be delivered not later than 12 o'clock noon. Deposit: £2 2s.
1910. Jan. 31.	NATIONAL MUSEUM OF WALES. The Council desires to receive competitive designs for the erection of a new National Museum at Cardiff, Three premiums are offered of £200, £150, and £100, for second, third, and fourth. The Council have appointed Sir Aston Webb, R.A., Mr. John J. Burnet A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A., as Assessors. Particulars and plans of the site will be supplied to competitors on payment of a fee of £2 2s., returnable if all papers are returned within 14 days. Inquiries to be addressed to Dr. Wm. Evans, Hoyle, Director of the Museums. City Hall, Cardiff.
Feb. 1.	OLDHAM, EXTENSION OF THE TOWN HALL. Restricted to Architects practising or residing in the Borough. Premiums of £50, £30 and £20, for the three designs placed 1st, 2nd and 3rd, and a sum of £5 will be paid to all unsuccessful competitors who send in a complete set of plans in accordance with the instructions. Plan of site, with instructions and suggestions for architects obtainable from E. C. Foote, Borough Surveyor, Town Hall, Oldham. Deposit: 21s.
Mar. 1.	GLAZED BRICKWORK DESIGNS AND ESSAYS. A committee of glazed brick manufacturers invite designs for works to be executed in glazed brickwork, also essays as to the advantages to be derived from the use of this material in accordance with conditions to be obtained from J. Johnston Green, 142, Liverpool Road South, Southport. Premiums of 100 guineas, 50 guineas and 25 guineas awarded to designs and essays jointly. Assessor Mr. Max Clarke, F.R.I.B.A., appointed by the President, R.I.B.A.

Workington Technical School Competition

We are desired by the Secretary of the Royal Institute of British Architects to mention, for the information of architects proposing to take part in this competition, that the R.I.B.A. Competitions Committee is in communication with the promoters with a view to the amendment of the conditions of this competition.

Law Case.

Arbitration on Hot Water Supply Service Installation.

In the heating and domestic engineering trade disputes have been caused within the last few years in some districts by the aggressive action of the plumbers in claiming a monopoly of pipe fitting and fixing work in all metals (whether lead or not), to the exclusion of any other trade. With the object of preventing such disputes, the engineers have all along been willing to submit the whole matter to arbitration for a general, national settlement. A step in this direction has now been taken in connection with a dispute on the new Masonic Hall, Leicester. Lead work is not in dispute, as it is not touched by the engineers. After protracted delay the plumbers agreed to join in an application to the Board of Trade to appoint an arbitrator to hear and determine the question of dispute between the parties. Alderman T. Smith, J.P., was appointed to act as arbitrator, and heard the case in Leicester on the 5th and 6th inst., the parties represented being Messrs. Ashwell and Nesbit, Ltd., the heating and domestic engineering contractors, the Masters' National Association, and the Operatives' National Union connected with this trade, on one side; and the plumbers' section of the Leicester and District Building Trades Employers' Association and the United Operative Plumbers' Association (Leicester District), on the other side. At the termination of the proceedings the arbitrator reserved his award, but it is expected to be given immediately.

The Kalendar of the Manchester Society of Architects, covering the forty-fifth session, 1909-10, has appeared, price sixpence.

* * *

Chelsea Borough Council has received official intimation from the Superintending Architect, London County Council, that that body has consented to the erection of New Crosby Hall on the northern side of Cheyne Walk. This building is to be commenced within six months and completed within eighteen months, dating from August 27th last, and it is to be erected and retained without any addition, and in exact accordance with the application of the University and City Association of London, Ltd.

Obituary.

Mr. Thomas Worthington, F.R.I.B.A.

We regret to announce the death, which took place on the 9th inst., of Mr. Thomas Worthington, the well-known Manchester architect. Mr. Worthington was born in the year 1826 in Crescent Parade, Salford, and educated at Dr. Beard's school. Among his contemporaries there were John Ashton Nichols, Christopher Kay, and Sam Pope, Q.C. At a comparatively early age he left school to enter the office of Mr. Henry Bowman, a scholarly architect of literary tastes, who afterwards took Mr. Crowther into partnership. He served his articles with this firm, and during this time was founded his very accurate knowledge of architectural detail, which was extended by the measurement, in company with Mr. Bowman, of mediæval work, principally undertaken with a view to the publication of Bowman and Crowther's "Churches of the Middle Ages," many of the fine illustrations in which were his work.

When nineteen years old he won the Isis gold medal given by the Society of Arts for a design for a church, and two years later, in 1846, an essay obtained for him the silver medal of the Royal Society of British Architects. By these successes and through his elder brother, Mr. William Barton Worthington, he became known to Sir William Tite, who invited him to join his staff for the building of Carlisle railway station. In 1847 the work there was suspended owing to the railway crash, and Mr. Worthington made use of his enforced holiday to visit Italy. His travelling companion was Mr. H. D. Darbishire.

On returning to England he worked for a time in London with Sir William Tite, and then settled in Manchester. He acted as local secretary for the Great Exhibition of 1851, and became a member of the Councils of the School of Art, the Royal Manchester Institution, and the Sanitary Association. He was secretary to the Committee for the Wellington Memorial, and it was largely due to his efforts and to those of Bishop Lee that the Infirmary Esplanade took the place of an unsavoury waste place and dirty water.

His first work of any size was the Overseers' and Churchwardens' Offices in Fountain Street; after these be built several large baths and washhouses, the Lancaster railway station, and numerous private houses. To the important works of his later years must be added Manchester College, Oxford, Brookfield Church, Gorton, and other churches, and the memorial fountain to Lord Frederick Cavendish at Bolton Abbey. Hospital work formed a considerable part of his practice. He was one of the first architects to adopt the pavilion system of hospital planning, and he built the Royal Infirmary at Halifax, the Royal Infirmary at Wigan, the Royal Bath Hospital at Harrogate, the Chorlton Union and Prestwich Infirmaries, the Convalescent Institution, Liverpool, and other similar institutions. Other work was done in partnership with Mr. Elgood, who died in 1893, and with his son, Mr. Percy S. Worthington, who became his partner in 1891, and who now carries on the practice.

Mr. Worthington became a Fellow of the Royal Institute of British Architects in 1865, and was its vice-president from 1885 to 1889. He was president of the Manchester Society of Architects from 1875 to 1877, and for many years took an active part in its work. Perhaps his chief interest outside his profession was the work of the Royal Manchester Institution, of which he was president for several years.

Messrs. J. H. Nicholson and Co., heating, ventilating and general engineers, have moved their offices from Suffolk House, Lawrence Pountney Hill, Cannon Street, E.C., to larger and more commodious premises at 110, Cannon Street, E.C.

DRAWN BY F. L. GRIGGS.

Notes and News.

Mr. James Kiernan, builder, has moved from 100, Talbot Street, Dublin, to Richmond Works, North Richmond Street, Dublin.

* * *

Mr. H. G. Norris, auctioneer and estate agent, and partner in the firm of Allen and Norris, builders, has been elected Mayor of Fulham. Mr. Max Clarke, F.R.I.B.A., the well-known architect, has also been elected to a Mayoralty, that of Holborn.

* * *

A public meeting held at St. Cross, Winchester, has decided to honour and perpetuate the memory of the late Master of St. Cross, Canon the Hon. Alan Brodrick, by the erection of a memorial, the form of which is to be decided upon by the subscribers. A strong and influential committee has been formed to carry out the project.

* * *

Two famous residences will shortly come into the market, Kelmscott House, well-known as the home of William Morris; and the house of Mr. Mortimer Menpes, 29, Cadogan Gardens, which will be put up with the furniture. It will be recollected that this house was decorated by Japanese artists working under Mr. Menpes' direction.

* * *

The entire sanitary installation of the new Automobile Club, Pall Mall, London, including all fittings, which is in course of erection on the site of the Old War Office, Pall Mall, under the direction of Messrs. Mewès and Davis and E. Keynes Purchase, associated architects, is to be carried out by Messrs. Doulton and Co., Limited, sanitary engineers, Lambeth, London, S.E.

* * *

The Sir John Moore centenary memorial at Sandgate will be unveiled by Miss Mary Carrick Moore, great niece of the famous soldier, on Friday, November 19th, at 2 p.m. Sir E. A. Sassoon, Bart., M.P., will preside. For the convenience of visitors, the S.E. and Chatham Railway Co. have arranged that the 10 a.m. Continental express from Charing Cross shall stop at Sandling Junction for Sandgate. Professor Bonanni is the sculptor.

* * *

Mr. J. Howard Colls, of Messrs. George Trollope and Sons, and Colls and Sons, Camberwell, who was asked by the local branch of the General Union of Carpenters and Joiners for a subscription for the unemployed, has sent a donation, accompanied by a letter, in which he says:—

"The work that has to be done by you and me has to be paid for by people who have the money to spend, and directly you arouse in them the feeling of insecurity—and there is no doubt that this feeling has been aroused—they naturally refrain from spending this money.

"Unfortunately, the building trade suffers more than any other in this respect, because certainly more than half of the work done by builders is not a necessity, but a luxury. You, if you call to mind the various jobs you have been to from time to time, must realise this undoubted fact, and I know, from my own experience, of the enormous amount of work of this nature which has been abandoned. . . . .

"I can tell you that not only is the work of which I have spoken—that is, the general work done for ordinary people—abandoned, but there is almost an entire stoppage of supplies from those who in the past have lent money on mortgage on building land and the buildings erected upon it. . . . .

"You may think that this should not be so, but, after all, you have to deal with facts, and in your own interests it is well you should consider how far this stoppage can be prevented, and whether it would not be much wiser and better for you if these unwise attacks upon capital, as such, had not been made, and were now discontinued."

The London County Council are arranging to obtain certain restrictive covenants on the Meadowside and Meadowbank estates at Twickenham. These lands adjoin Marble Hill, the central feature of the famous view from Richmond Hill, which was preserved from building development by being purchased some years ago and turned into a public park.

SOME CAUSES OF FAULTY CONCRETE CONSTRUCTION.

(*Concluded from page* 370, No. 770.)

There is no end to the opinions relative to the contraction and expansion of concrete floors and its causes. Cement naturally expands very slightly, and so, therefore, must concrete, unless we assume that its particles undergo slight compression arising from the action of the cement, which is not improbable. The general opinion held in regard to the expansion of concrete is that it expands slightly when first deposited in place; but when the permanent set of the cement has taken place, say within 48 hours, often expansion ceases, and as a large floor is usually some time in hand, the bulk of the concrete has passed beyond the expansion stage before it is completed. How long it is before contraction takes place seems to depend upon surrounding circumstances.

The greater care taken in the preparation of sand and aggregate mixed with cement, the less liable the concrete is to expand.

Use of Boiler Clinker and Flue Ashes and Coal.

A common failure of the practical test of cement in concrete is caused by the use of coke-breeze or furnace cinders as an aggregate. It is very often the case that small pieces of under-burned coal and even of coal not burned at all are included in the bulk quantity of these aggregates for concrete-making, and the result is often an entire distintegration of the concrete mass. Boiler flue-dust is often again used in place of sand for concreting purposes, and the result is often eminently unsatisfactory in cement work. The coal ash material taken from boiler flues is generally found to contain sulphurous acid and sulphite of calcium originated by the sulphur found in the fuel, and the result of this is that by "weathering," a concrete made with such material will suffer complete disintegration, or other results will happen more or less serious in proportion to the quantity of this aggregate used. If the flue ash is old and has been well aerated or slaked with water previous to using there is a less risk of disintegration ensuing, but this treatment by no means makes flue dust a safe aggregate to use with cement.

Another case of expansion of a boiler-ash aggregate in concrete is explained in the following instance:—

A concrete roof, composed of one part of cement to 4½ parts of boiler ashes, showed signs of expansion (not disintegration) within three weeks of the laying of the concrete, and continued to expand during the period of observation, viz., two months.

The roof sloped from a central ridge, each slope being divided into four or five bays. The expansion of the lowest bay had forced out the L iron holding the roof, and in so doing had broken the ½in. bolts attaching the L iron to the walls. The concrete in the middle bays being held at the ends by the purlins had buckled upwards, while the top bay of each slope had forced up the ridge of the roof. The walls on which the roof rested and the gable end wall were forced outwards by the expansion.

The cement was of normal slow setting quality, and showed 3 mm. expansion in the Chatelier test when fresh and 2 mm. when used. There was no sign of disintegration of the roof, and pieces of the concrete immersed in boiling water for several hours remained unaltered, and even hard.

It is a reasonable conclusion, therefore, that the boiler ashes in the concrete were responsible for the expansion, although it is remarkable that a roof composed of cement and ashes from the same source erected a year previously is satisfactory in every way.

To demonstrate the expansive tendency of boiler ash concrete a number of bottles were filled with concrete composed of slow setting cement (of 3 mm. expansion) with 5 parts of various aggregates. The behaviour of these bottles was as follows:—

Neat cement.—Bottle intact after 28 hours.

Boiler ash concrete (4½—1).—Bottle burst in 5 days.

Coal (pea-size) concrete (4½—1).—Bottle burst in three days.

Granite concrete (4½—1).—Bottle intact after 28 days.

Coke-breeze concrete (4½—1).—Bottle intact after 28 days.

Ground coal concrete (4½—1).—Bottle cracked in 19 days.

Boiler ash concrete (4½—1), free from combustible matter.—Bottle intact after 20 days.

The tendency of boiler ash concrete to expand was thus illustrated, and although the investigation was not sufficiently extensive to allow of a definite statement being made, it would seem that coal, which is an invariable constituent of ordinary boiler ashes, is the disturbing element.

As to the precise cause of the swelling of boiler ash concrete, it is difficult to express an opinion in the present state of definite knowledge upon the point, although observations have indicated that the presence of combustible matter is responsible for the expansion, and this may probably cause disintegration in time.

Cinder Concrete.

The writer of an editorial note in a specialist organ seems to be rather distressed about the disfavour with which cinder concrete is regarded in Germany, and particularly concerning the ministerial order forbidding the use of coal residues as aggregate for reinforced concrete and for concrete which may côme in contact with structural iron or steel. In seeking to minimise the force of this prohibition he suggests that the word "kohlenschlacke" means a local variety of coal residue containing a considerable amount of sulphur and having the faults common to pan breeze in this country. This is quite wrong, for the general term "kohlenschlacke" (literally "coal cinders") covers all residues of every kind of coal. "Clean coke breeze" is the most combustible variety of coke residues, and therefore the least desirable for fire-resisting concrete. but in consequence of its value to the producers as fuel this quality of coke is scarcely obtainable in the present day, and builders are almost universally compelled to fall back upon "pan breeze"—or the material collected from the ash pans of coke ovens. Apart from any question of calorific value, an insuperable objection to all coal residues is the presence of sulphur, which exercises a deleterious influence on cement and embedded steel, and so justifies the embargo wisely placed upon the use of all coal cinders in reinforced concrete by various German authorities, and, also, by British architects and engineers who realise the importance of the question.

Cracks and Weather.

Concrete walls built in cold weather are less liable to cracks than those built in summer. Another feature of the same subject is that lime concrete is less liable than cement concrete to give evidence of expansion or contraction, and walls a hundred feet in length, built of the former material years ago, show no sign of any change. As lime is credited with being of a much more expansive nature when made into mortar than Portland cement, this is a conclusive proof that the matrice in a lime concrete wall, like the lime mortar of a brick wall, is of a yielding and compressible nature, and as Portland cement is the reverse, we have to attribute to this fact the cracks which cement walls are sometimes liable to.

Heavily Loaded Walls.

It is noticeable, too, that high concrete walls, or walls heavily loaded, give but little evidence of contraction or expansion, a natural result of the counteracting force exercised by the great weight imposed thereon, and the transverse tie of floors, cross walls, etc., while, on the other hand, in low thin boundary walls, cracks of considerable size often appear, and an almost uniform distance apart. The upper portions of concrete boundary and dwarf walls are more disfigured by cracks than the lower, owing to the tie or key which the foundations, or portions below ground, give to the part nearest thereto.

Temperature Cracks in Walls.

Another reason why boundary and similar walls afford such direct and palpable evidence of change of temperature is, that they are exposed on both sides to extreme climatic influence, while walls of buildings are more protected, one side being subject to but little variation of temperature. Some curious remedies have been proposed for this misfortune to concrete, not the least striking being to make vertical joints in the walls of concrete houses by inserting a piece of wood or iron every 12 or 15 feet apart—practically building them in sections—so that instead of irregular cracks, less unsightly ones should be substituted.

Precautions Necessary in Wall Construction.

Although it is not often seen that serious consequences arise from shrinkage and expansion in concrete walls, it is fair to assume that the latter must be weakened to some extent, and the appearance is most objectionable; all necessary precautions should therefore be taken to prevent them.

A free use of water thrown over concrete saturating the material, in hot weather a desirable practice, and the concrete work should not be rushed unless great urgency of erection is necessary.

Obviously, too, when operations are suspended for a time, or walls are for any reason stopped off at some part of the buildings, the stoppage should not occur at the weakest points, as, for instance, near door or window openings, for the concrete is then less able to resist the strain caused by climatic conditions.

Cracks in Walls where Work is Pieced.

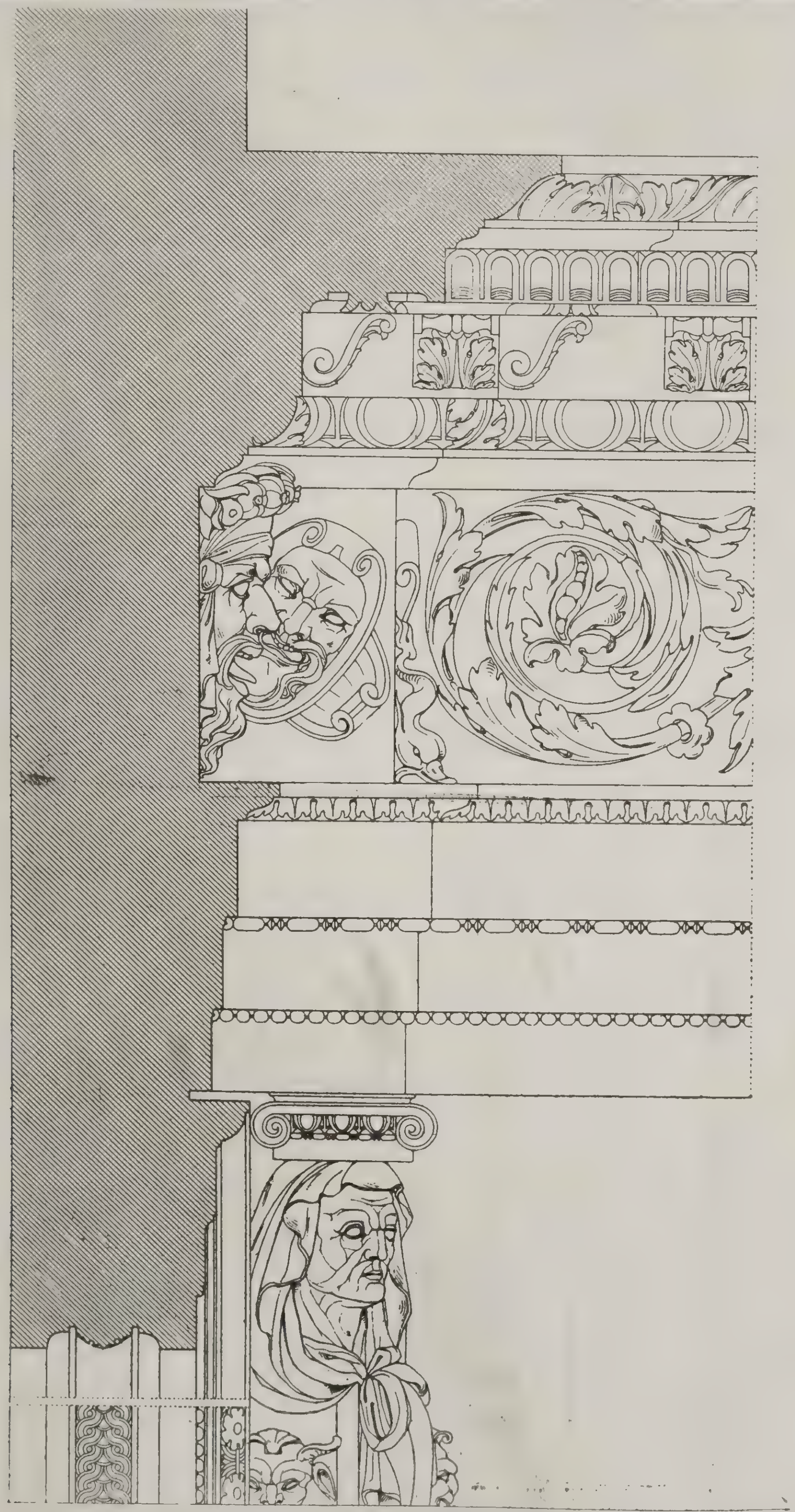
Sometimes where it is not practicable to store cement on the job, low walls, which have been erected in pieces, will show horizontal fissures or cracks between each "lift" or layer of concrete, or where a section has been left for a time before another deposit has been made.

Temperature Cracks in Bulk Concrete.

In large and bulky concrete works, such as in the case of dam and reservoir construction, temperature cracks are often found to occur which cause the engineer in charge considerable apprehension.

Although the Portland cement used in concrete work is often stated to be the cause of any untoward incident in the concrete construction, yet, in such cases as those now described, the trouble will invariably be found to arise from the effects of thermal variations of dimensions, and this defect is substantially the same, whether the older class of heavy rubble masonry is employed in construction or the more modern cyclopean concrete. This cracking, often seen in heavy masonry or large area constructions, has already been the subject of a considerable amount of investigation by engineers, and in dealing with this matter in a paper published by the American Society of Civil Engineers, Mr. Gowen describes the results of his observations on the cracks formed in the new Croton dam, near New York. In this work cracks in the bulk concrete were opened by the fall in temperature from summer to winter, while the construction of the upper part of the dam was in progress, and in another similar construction a dam at the Cross River, where the masonry of the uncompleted dam was exposed during one winter only, no substantial cracking was noticed until the cold weather of the next winter produced separation of the masonry at a number of points after the work was complete.

In the case of the cracks formed in the new Croton dam, then more particularly enquired into, it appeared there were three principal cracks in the main body of the dam, and three others in the overflow. All these cracks were in the top of the dam, where the masonry was thinner than in any other portion of the structure, and they opened with the falling temperature of the late autumn and winter, as would naturally be expected. The greater part of the main dam was built of heavy rubble, well and solidly laid so as to prevent seepage to the greatest possible extent. The widest crack was less than one-eighth of an inch. All of them extended through the mass of the dam at and near the top, but they ran out lower down. They were obviously capable of letting some water through, but the surfaces of parting of the masonry were necessarily rough and irregular, so that small quantities only could flow through. In the Cross river dam there was one interesting feature of construction not found in the Croton dam. A considerable number of twisted square and other deformed rods were laid in the masonry continuously from one end to the other for some distance down from the top of the structure for the purpose of reducing as much as possible the temperature cracking. No published account of the results of this experience at Cross river has yet appeared, but it is understood that about the usual amount of cracking took place. At first sight cracks like those described may



DETAIL OF ENTABLATURE: THE LOGGIA OF THE VILLA CAMBIASO, GENOA.
GALEAZZO ALESSI, ARCHITECT.

seem serious, but extended experience has shown that such is not the case. The openings are always narrow in the interior mass and so sinuous with rough surfaces as to create much resistance in the flow of water through them. It is true that a well-defined, although very small, stream appeared at the down-stream face of the dam, but its discharge measured little in actual volume, even in the coldest weather, and, therefore, when widest. They were easily stopped, almost entirely, in a number of ways, as by the use of mortar, lead, wool, or other means. When the cracks are filled with neat cement or cement mortar, the expansion of the next summer may crack or spawl off some masonry edges, and by thus filling the crack wherever they open, it will require but two or three seasons to secure an essentially continuous masonry mass, needing little or no subsequent attention. A long wall or conduit may require longitudinal reinforcement to prevent temperature cracks, and consequent leakage.

Cracks in Ornamental Floors.

Mosaic tile and terrazzo chips for floors, if bedded and grouted with cement, often become disfigured from cracks which do not appear until months, and possibly years, after the work has been executed. Sometimes these cracks follow the line of the joists supporting the concrete, at other times they are of an irregular shape. In the former case they are probably due to a slight shrinkage in the concrete where the joists break the continuity; but this does not account for those of irregular shape. The latter may arise from unseasoned cement, or cement which has not been tested for soundness, both for bedding and grouting; the large amount, comparatively, used for grouting and bedding terrazzo chips, helps still further to develop cracks.

In the case of mosaic paving the remedy appears to consist of laying it in small portions, leaving intervening spaces for a time before completing the work, or better still, forming with narrow bands the pattern and the general portion of the work to be done. The fine floor of the new booking office at the Waverley Station, Edinburgh, is greatly disfigured with cracks of a variety of shapes, and which did not appear for a long time after the floor was finished.

Surface Cracking.

The finish of concrete surfaces with Portland cement is often unsightly in the numerous surface-cracks which develop in the work, and this is regularly attributed by the ignorant to the unsoundness of the cement which is employed. This is a defect commonly seen in concrete work, and is known as "crazing." These cracks (sometimes also called "hair" cracks) appear on cement work or artificial stone after weathering, but the very unsightly appearance presented is often the full extent of the deterioration. The fine hair cracks which are so often discernible in artificial stone arise as a rule from the surface of the cement drying more rapidly than the bulky portion of the concrete. The defect, which is not the fault of the cement, can be entirely avoided by adapting the treatment of the materials to the work in hand. That this "crazing" or fine cracking originates in the manipulation of the concrete is proved by the fact that the same defect occurs in work carried out with the soundest and best made cements. These hair cracks appear to connect themselves wholly with a mortar too rich in cement.

No cement should be used in the dressing of concrete work without being well mixed with sand or other very fine aggregate, for the superficial cracks are caused by the natural variation in volume of the neat cement face of the stonework being disproportionate to the concrete bulk. When facing or dressing, the surface work or veneer must be well rubbed down to the concrete base of the stone work.

Hitherto practice has favoured a smooth surface for concrete, giving the uniform grey colour of the cement. In fact, many constructors have used as a surface finish an almost neat cement mixture, with the result that the surface produced was a dull grey, very difficult to secure uniformly, and hard to retain when once secured.

This method has been demonstrated to be wrong, and it has been shown that the surface of concrete should show, not the cement, but the aggregates. In this way only can a variety in surface finish be obtained. When the aggregates are made to constitute the surface an almost endless choice of surfaces is to be had, varying from a fine white sand finish, through all grades and shades of sandstone and quartz surfaces, to heavy and massive granite. The method is simple, and consists in using near the surface an aggregate of whatever finish is desired, and by removing the cement film from the concrete. When the moulds are removed this aggregate is brought out in relief, giving an artistic appearance. A very successful method for producing this finish consists in applying a solution to the concrete after it is hard and dry, which removes the cement, exposing the aggregate, and by careful washing a surface may be obtained that is practically everlasting, and one that can never show surface cracks, discolorations, or other imperfections inherent in a plain, untreated concrete surface.

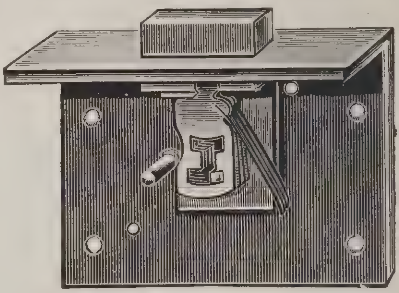
Trade and Craft.

Fireplace Designs.

We have received from Messrs. Gripper and Beatley, 122, Great Portland Street, W., a catalogue of commendable designs for grates, interiors, mantel registers, and ranges. The majority of grate designs are founded upon antique patterns, and are marked by reticence and breadth in the design.

Margewood Locks.

We have received an illustrated catalogue describing the "Margewood" locks, in which the bolt and levers are combined instead of being separate working parts. The levers, instead of being pivoted to the lock plate and having only a single bearing, are pivoted in the bolt, in suchwise that they cannot get dislodged, and they form with it an inseparable working union. The lever stump is not pivoted to the thin tail of the bolt, but is a rigid fixture, with a double bearing in the lock plate; the bolt and levers travelling together as one piece over the lever stump. It will be seen, therefore, that the "Margewood" locks reverse the construction of lever locks, while retaining the advantages of the lever principle. The method of construction ensures that the bolt cannot be forced without shearing the lever stump from its double bearing. Overshooting or falling down of the bolt is impossible; the levers cannot get out of position; the lever stump cannot be forced, broken off, work loose, or get out of position. The difficulty of picking the lock is greatly increased, and its strength and durability seem to reach the utmost possible limit, the simplicity and equal balance of the parts rendering it almost impossible for any of them to get out of order. The "Margewood" locks, though of the highest class of manufacture—they are of British invention, and are made in England—are sold at popular prices, and are already in extensive use by the London County Council and other important public bodies. They are made for tills, drawers, safes, boxes, desks, and cupboards, as well as for doors—in fact, are adapted to all services; and they are also made in padlock form. The "building locks" section of the catalogue (which can be had from Margewood Locks, Ltd., 11, Clerkenwell Green, London, E.C.), shows various patterns and qualities of mortice and rim locks and latches; and actual specimens that have been submitted for our examination bear out all that is claimed for them. These locks have won the highest honours at several exhibitions.



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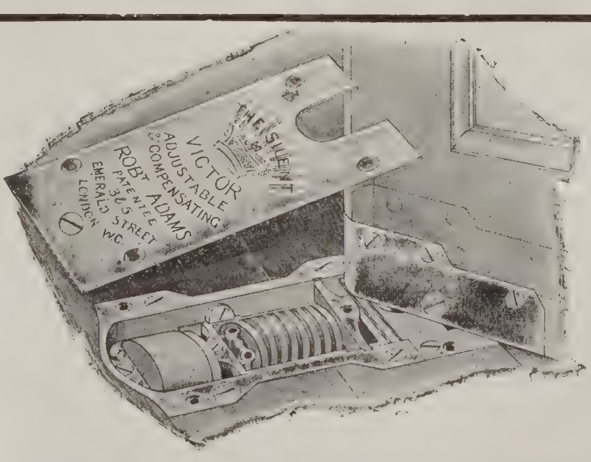

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MONTHLY OFFICIAL REPORTS.

THE NATIONAL FEDERATION.

Death of Mr. G. H. Storrs.

Profound sympathy is felt with our esteemed chairman of the National Board of Conciliation, Mr. Jas. Storrs, of Stalybridge, in the tragical fate which has befallen his partner and brother, Mr. G. H. Storrs, who was the victim of a murderous attack in his own house, on the evening of Monday, November 1st, as fully reported in the daily press. The president of the Federation has written to Mr. Storrs, expressing the sympathy of himself and his Council in this deplorable matter.

Forthcoming Meetings.

Meetings of Administrative and Journal Committee have been fixed for December 14th. A preliminary notice has been issued requesting matters for the agenda to be sent by November 25th.

The Executive Council and annual general meetings have been fixed for January 25th and 26th, 1910. Matters for the agenda of these meetings should reach the National secretary not later than December 31st next.

National Board of Conciliation.

Six months' notices of proposed alterations of the rules of above Board have been received, and advices thereof sent to the various county Federations.

The following are the

Proposed Alterations of and Additions to the Rules.

By the Amalgamated Society of Carpenters and Joiners.

New Rule (to amend Rule 19):—

(a) That any of the several Boards or branches of the trades affiliated shall have the power to suggest alterations and amendments to the rules, and the National Board shall alter the agreement in accordance with the majority of votes of the members of the various Boards.

New Rule:—

(b) That the representatives elected to sit on one of the Boards shall not be eligible to sit on either of the others, as a member or as a substitute.

New Rule (to amend Rule 3):—

(c) That each trade shall be represented by four delegates on the several board instead of two from each society. Each trade paying an equal share of the expenses, instead of each society as at present.

Amendment to Rule 4:—

(d) Should the Local Conciliation Board be unable to arrive at a settlement of any case or matter in dispute within fourteen days from the receipt of notice from either side, unless the time is extended by mutual consent, it shall be the duty of the aggrieved party to draw up the notice to the Centre Conciliation Board, which notice must be signed by both secretaries of the Local Conciliation Board prior to being sent to the Centre Conciliation Board, and a meeting of the said Centre Board must be held within ten days of the receipt of such notice for the purpose of hearing the appeal from the Local Board. (Remainder of rule as at present.)

Amendment to Rule 16:—

(e) Though in all ordinary cases the procedure shall follow the rules above written, yet for the purpose of more quickly arriving at an agreement on matters in dispute, it shall be competent for any of the several Boards by mutual and unanimous consent of the two parties, to call in an arbitrator, or arbitrators, with power to settle the dispute, and where this is done the decision of such arbitrator or arbitrators shall be final and binding. But when a case having proceeded through a local and Centre Board on to the National, and they are unable to come to a decision, this body shall then apply to the Board of Trade to appoint an arbitrator, such arbitrator to be a permanent paid official of the aforesaid Board, and whose decision shall be final and binding. The costs, if any, to be borne in equal shares by the employers and operatives unless left to the discretion of the arbitrator in all cases.

By the Associated Carpenters and Joiners' Society.

Amendment to Rule 16:—

(f) Identical with proposal (e).

Proposed New Rule:—

(g) That no individual be eligible to sit as a delegate on more than one section of the Conciliation Boards; this to apply strictly to both sides, employers and operatives.

By the Operative Stone Masons' Society.

Amendment to Rule 4:—

(h) Should the Local Conciliation Board be unable to arrive at a settlement of any case or matter in dispute within fourteen days from the receipt of notice from either side, unless the time is extended by mutual consent, it shall be the duty of the aggrieved party to draw up the notice to the Central Conciliation Board, which notice must be signed prior to being sent to the Central Conciliation Board, and a meeting of the latter must be held within ten days of the receipt of such notice for the purpose of hearing the appeal from the Local Board.

Proposed New Rule:—

(i) That in accordance with Conciliation Board, Rule 19, our society shall give due notice of alteration of rules, whereby a penalty clause, which shall be operative on both sides of the Board, shall be inserted for infringements.

By the Operative Bricklayers' Society.

Proposed New Rule:—

(j) That no individual be eligible to sit as a delegate on more than one section of the Conciliation Boards. This to apply to both sides, employers and operatives.

Amendment to Rule 16:—

(k) Identical with proposal (e).

Building and Engineering Works Bill.

This measure, which seeks powers which would enable the expected scaffolding regulations for the building trade to be issued, has been withdrawn for this session.

Conditions under which Tenders are sent in.

At the request of this Federation, a conference has been arranged for December 13th next, with the R.I.B.A., to discuss the desirability of some regulation of the conditions under which tenders are sent in.

The Comparative Statement of Wages and Hours of Labour

for the Federated towns will be republished in the Official Journal for December 15th. Secretaries of Local Associations and Federations are requested to forward particulars of any alterations which have occurred since last publication, to the undersigned, not later than December 7th.—A. G. WHITE, secretary.

The Northern Centre.

Secretary: James Denver, Cromwell Buildings, Blackfriars Street, Manchester.

The quarterly meeting of the Northern Centre Executive Council was held at the Hotel Metropole, King Street, Leeds, on October 18th, when Mr. Henry Matthews, J.P., Manchester, presided.

A notice for amending Rule 4 of the Conciliation Board rules, sent up by the Birkenhead Local Association, through the Lancashire and Cheshire Federation, was considered. The Birkenhead Association desired that the rule should be amended so that in case a local board fails to come to any decision, the aggrieved party in any dispute shall be allowed to draw up the letter of appeal to the higher authority. The matter received considerable discussion, and ultimately the following resolution was adopted: "That this Council do not consider the amendment as suggested by the Birkenhead Association necessary, and cannot therefore recommend it to the National Board for adoption." The secretary was instructed, however, to write pointing out that any notice of appeal should be as brief as possible, and that on no consideration should it contain statements of the case in dispute.

The question as to whether it would be desirable to enter into negotiations with the operatives' societies for the recognition of the rates of wages and working conditions in existence at the present time for a period of years was considered, but after some considerable discussion thereon, the matter was allowed to drop.

The secretary was instructed to get into communication again with the three Federations forming the centre, with a view to arranging as far as possible for uniformity of rules.—James Denver, secretary.

Northern Centre Conciliation Board.

A special meeting of the Northern Centre Conciliation Board was held at the Hotel Metropole, Leeds, on Monday, October 11th, when Mr. Thomas Wilkinson, Middlesbrough, presided.

The meeting having been called to hear an appeal from the Liverpool Local Board, witnesses were admitted to state their case. The operative joiners were claiming extra pay at the rate of 6d. per day (provided under Rule 3 of their working rules) for alleged insulation work at a cold storage, from a member of the Liverpool Master Builders' Association.

Mr. B. B. Moss, on behalf of the Liverpool Master Builders' Association, and with the consent of the operatives, appealed to the Board for a correct interpretation of the rule in dispute, which he contended would settle the case in point, and in addition would prevent friction arising thereunder in the future. This the Board were unable to do, although several votes were taken.

The case in dispute was then considered, and the witnesses were recalled to give evidence. On behalf of the firm, and in reply to a question from the chair, Mr. B. B. Moss admitted that from July 23rd the firm's workmen were working in a room where insulating materials were being used, owing to the floor above having from that date been broken through, and consequently making practically two rooms into one. The witnesses again retired, and the Board gave their decision as follows:—"That the workmen employed by the firm and working in the same room where insulating materials were being used, be paid 6d. per day extra as from July 23rd, until the completion of the new floor above."—James Denver, employers' secretary.

Lancashire, Cheshire, and North Wales Federation.

The monthly meeting of the Administrative Committee of the Lancashire, Cheshire, and North Wales Federation was held at the Federation Board-room, Manchester, on Friday, October 8th, the president (Mr. W. Cooke, jun.) in the chair.

The minutes having been read and confirmed, the secretary gave his report thereon.

Communications were read from local associations regarding their subscriptions, and the secretary was instructed how to reply thereto.

The secretary reported that owing to the very small attendance of local secretaries at the meeting called for September 29th, no discussions had taken place. It was decided that no further conferences should be summoned until there was a likelihood of more interest being shown in the proceedings.

Consideration was given to a notice received from the Birkenhead Association to amend Rule 4 of the Conciliation scheme. This notice had been before the Executive Board at their quarterly meeting, and by them was referred to the secretaries' conference for consideration and report, but owing to the small attendance thereat nothing had been done in the matter. After some discussion it was decided that the proposed amendment be sent up to the Northern Centre Executive for their consideration, without comment.

The meeting then proceeded to consider the question of "Delayed Payments for Contracts," referred by the Executive Board to this Committee, with instructions to draft proposals to submit to the various trade committees and local associations. A lengthy discussion took place, and it was ultimately agreed to refer the matter to a small subcommittee to consider and report thereon.

The secretary brought before the meeting correspondence which had taken place between the secretaries of the Bury and Rochdale Local Associations regarding the inter-trading rule, and he was instructed how to deal therewith.

Mr. James Higson called attention to the Government schedule of prices for daywork, and stated that, as he understood, the list was at present undergoing revision; and seeing that the prices allowed were below cost price, hewas of opinion that strong representations should be made by the National Federation to His Majesty's Commissioner of Works to have the schedule so amended as to be fair to the employer. It was agreed to refer the matter to a sub-committee consisting of the chairman of each branch trade committee.

The quarterly meeting of the Stonemasons' Trade Committee was held at the Boardroom, Manchester, on Thursday, October 28th, Mr. William Deakin, Manchester, presiding over a good attendance of representatives from the federated towns.

The chairman reported what was being done with regard to making suggestions to the revision of the Government price schedule for daywork, and a long discussion ensued.

The question of the importation of worked stone into a higher paid district was also considerably discussed, but no formal resolution passed.

It was agreed to hold the next quarterly meeting at Bolton.

Other matters of branch trade interest were discussed, after which the members retired to the Victoria Hotel for tea, on the kind invitation of the Manchester Master Masons. A hearty vote of thanks was accorded to the Manchester members for their hospitality.—John Tomlison, secretary.

ALTRINCHAM, SALE, AND DISTRICT ASSOCIATION.

Secretary: W. Moody.

The annual general meeting of the Altrincham, Sale, and District Association was held at the secretary's office on Wednesday, October 20th, Mr. James Hamilton, the president, in the chair.

The Secretary read the eleventh annual report, in which it is recorded that, "During the year efforts have been made to come to a settlement with the operative carpenters and joiners on the question of the working rules, but so far without success; the point at issue being the determination of this Association to meet local operatives only, whereas the employees have expressed their

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determination to negotiate only through their Manchester Executive. It is the committee's intention to lay the facts before the Lancashire, Cheshire, and North Wales Federation, and ask them to take the matter up.

"One or two small complaints have been received from the operative bricklayers' and plumbers' societies, which, on being brought to the notice of the employers concerned, have been satisfactorily arranged, being principally matters concerning the employment of apprentices, and in connection therewith the committee would again impress upon the members generally the desirability of having their apprentices properly bound as soon as possible after their entering their employment.

"Owing to the serious illness of the treasurer, the secretary presented the balance-sheet, which showed total receipts £77 19s. 5d., and payments £78 7s. 9d. During the year the sum of £200 had been invested in Lancashire and Yorkshire Railway stock, and the balance in the bank after paying the purchase money was £29 16s."

At the meeting at which the report was presented, the President referred to the very satisfactory state of the finances, and regretted the serious illness of the treasurer (Mr. Drinkwater), who had been connected with the Association since its inception; and, on the chairman's proposition, it was resolved that the secretary convey to him the deep sympathy of the members generally, and expressing a sincere wish for his speedy recovery.

The president was again unanimously reappointed, and thanked the members for their confidence, and trusted that the coming year would be a successful one, and that trade would improve.

A hearty vote of thanks to the president, vice-president, and committee for their services during the past year concluded the business.

BARROW-IN-FURNESS ASSOCIATION.

Secretary: J. Baker.

The monthly meeting of Barrow-in-Furness Association was held on October 26th, and was well attended.

The case of one of the members v. the insurance company with which the whole of the members were insured last year, was discussed, and it was decided to instruct the solicitor to arrange with the company.

The Secretary was instructed to write a prominent firm in the town calling attention to the association's rule regarding the giving of quantities when asking for tenders amounting to over £30.

It was resolved to requisition the railway company for better telephonic communication in respect to the receipt of materials.

Approval was given to the circular submitted setting forth terms of advances to be given to apprentices for success at technical classes.

Two new members were proposed to be balloted for at next meeting.

BOLTON AND FARNWORTH ASSOCIATION.

Secretary: J. R. Vose, F.C.I.S.

The quarterly meeting of members of Bolton and Farnworth Association was held on Monday evening, October 25th. Mr. T. E. Coope, vice-president, occupied the chair in the absence of the president (Mr. B. Talbot) through indisposition, and nearly fifty members were present.

The secretary presented the quarterly report of the Committee, which was approved.

It was agreed to adopt the following new rule:—"That members should not sign any contract which contains a clause to maintain the works which have been executed, for a period of over twelve months from completion," and further to adopt the following "Form of Estimate" when tendering for work:—"My (our) estimate for the execution of the several works required in   is the sum of £   . This estimate, however, shall not by acceptance constitute a contract, but is subject to the preparation and approval of a formal contract to be signed by you and myself."

Mr. Frank Woods, the representative of the association to the Lancashire and Cheshire Federation, gave his report for the quarter, and a very interesting discussion took place on the subjects named therein.

It was decided to refer the reprinting and revision of the rules to a committee.

The secretary gave a report on the recent Conference of Secretaries held at Leeds, giving an outline of the various points which had been given in the papers that were read, and the same was approved.

A welcome was given to the Horwich contractors, who had expressed themselves willing to join the association, and who attended in fair numbers, the chairman expressing the hope that by the added strength to the local association, and, further, the benefits they would receive by using the machinery of the larger Association, the benefits derived would be mutual. Messrs. Slater, Makinson, and Ware, replied to the resolution, and expressed themselves as being ready to assist in every way they could to extend the working of the association.

It was decided that the association should in future be known as the "Bolton, Farnworth, and Horwich Building Trades Employers' Association."

Other matters affecting the trade were discussed.

BURNLEY AND DISTRICT ASSOCIATION.

Secretary: G. Astwood.

The annual meeting of Burnley and District Association was held in the Coffee Room of the Mechanics' Institute on Tuesday, Oct. 26th, Mr. Saml. Smith in the chair.

The Federation reports were read and commented upon.

The Secretary presented the balance-sheet for the year, which shows a balance in hand of £5 9s. 3d. The balance would have reached £11 had there not been some extraordinary expenses, which can hardly occur again, and a gain of £2 over the year previous would then have been shown.

The accounts having been passed, the officers for ensuing year were then elected.

Mr. Robt. Smith proposed, and Mr. Durtin seconded: "That the out-of-pocket expenses of representatives attending the trade committee meetings be paid by the association.

The Secretary brought before the meeting the report of the Journal Committee in respect to the official organ, the "Builders' Journal." The president (Mr. Smith) spoke in high terms of the matters dealt with by the journal, and strongly advised all members to become subscribers.

A note from the Bolton Association was read with respect to tenders for a certain building extension at Bolton.—Mr. Schofield proposed, and Mr. Wiseman seconded, "That this association do all they can to support the Bolton Association."

Mr. Harrison asked for the opinion of the meeting in respect to the Joiners' Association and the Builders' Association, the former having framed rules of their own which clash with those of the builders. After some discussion, Mr. Harrison proposed, and Mr. Dean seconded, "That a special general meeting be called on November 16th to consider the question of the future working of this association and the joiners.

MANCHESTER, SALFORD, AND DISTRICT ASSOCIATION.

Secretary: John Tomlison.

The monthly meeting of the Master Plasterers' and Painters' Branch of Manchester, Salford, and District Association was held on Tuesday, October 12th, when Mr. James Cadman presided over a well-attended meeting.

The committee reported on their interview with the plaster partition manufacturers with respect to the suggested working agreement for the fixing and finishing of partitions, and after some considerable discussion, and with one or two slight amendments to the draft agreement, the same was agreed to subject to confirmation by the manufacturers.

Mr. J. Higson raised the question of the Government price list for daywork done under His Majesty's Commissioners for Works, and a lengthy discussion ensued, but no formal resolution was passed.

The monthly meeting of the General Committee was held at the Association Boardroom, on October 21st, when the president (Mr. Samuel Gerrard) presided.

The accounts as presented by the secretary were passed for payment.

Five new members were elected into the association.

The question of carrying out the resolution passed at the annual general meeting regarding the inter-trading rule was down for further discussion, but, in view of several matters at present pending, it was agreed to postpone the same until the next meeting.

The question of municipal trading by the Manchester and Salford Corporations was again discussed, but, in the absence of any definite information, it was decided to drop the matter for the present.

In accordance with instructions given at the last meeting, the secretary presented an estimate of the cost of supplying each member of the association with a copy of the Journal under the resolution passed by the National Federation some time ago. After consideration, it was resolved to authorise the secretary to write again to the members urging them to become subscribers to the Journal.

The Master Builders' Committee met at the close of the above meeting to receive the report of the deputation appointed to interview the Architects' Society regarding the questions of (1) Builders' discount on P.C. sums in quantities; (2) The period of maintenance; and (3) Time limit for the settlement of contracts. The president stated that the Architects' Committee had agreed to lay the matter before their members, and write informing the association of the decision.

The Stonemasons' Branch of the association held their usual monthly meeting on Thursday, October 28th, when matters of general trade interest were discussed.

The branch afterwards entertained the Stonemasons' Trade Committee of the Federation, who were holding their quarterly meeting in Manchester, to tea at the Victoria Hotel.

WIGAN AND DISTRICT ASSOCIATION.

Secretary: R. Hollows, Chartered Accountant.

The monthly executive meeting of Wigan and Dis. Association was held at the Clarence Hotel, Wallgate, Wigan, on Tuesday, October 19th, when the president, Mr. Wm. Webster, presided over a good attendance of members.

Several applicants for membership were admitted.

Mr. Robert Hollows, chartered accountant, tendered his resignation as secretary, which was accepted with regret.

The association has been for some time past endeavouring to get the members of the building trade in Hindley and district to join forces with them, two or three of them being members at present, while the great majority would not come in. Two meetings have been held at Hindley, at which new members have been enrolled, and it is probable that the majority of those still remaining outside will join in the near future. The trade in that district has been in a very bad state for some years past, and the lack of organisation on the part of the employers has hindered rather than assisted the matter.

The association has given notice of alterations to present working rules with the operative plumbers, and with the operative painters, and has received notice from the operative joiners.

The variations embodied in the notice to the operative painters' society are as follows:—Hours of labour: The starting time of work in the summer months to be at 7.30 a.m. instead of 6 a.m., and the men are to be at the boundary at 12 noon on Saturday, instead of at the shop. Breakfast to be had before commencing work all the year round.

The following new rule has been added to the above rule: "Any employer having a shop beyond four miles radius from the Wigan Market Place, and taking a job in Wigan and district, shall comply with the rules of the Wigan employers. Should any employer require his men to travel by train or tramcar to a job within a four miles' radius, the workman, on payment of the return fare by the employer, shall travel by car or train, leaving the terminus or station at the first time immediately preceding the starting time of work. With respect to the railway train or car, this clause to apply only to those starting within twenty minutes preceding the starting time. With respect to meal hours and starting times for country jobs, a joint agreement between the employers' and employees' societies may be made to fall in with the running of the trains." Country work: This rule remains as it was, except that the radius within which an employer has the option of paying wages on the job has been decreased from five miles to four miles. The following new rule has been added to the above rule: "And should a Wigan employer have a job exceeding four miles from the Wigan Market Place, he shall be at liberty to start men on the job."

The variations embodied in the notice to the operative plumbers' society are as follows:—Working hours in summer months to be 49 hours per week, instead of 54½ hours as at present, and for the winter months, 44 hours per week instead of 47. The winter period has been extended from November 12th to February 6th, to the period from November 1st to March 1st—an increase of five weeks.

The following clauses have been inserted in the rules, viz.:—"Workmen, if requested by the employer, must start at the Wigan Market Place, and leave by the tramcar or train nearest the first starting time. Employers to have the option of engaging men on the job on similar conditions to those allowed to employers from other towns." The "country job" rule has been amplified by the stating of certain boundaries for the several districts, and the starting places have been fixed at these several places for outgoing workmen. On Saturday, incoming men shall be at the boundary by 12 noon, instead of at the shop, as formerly.

The variations embodied in the notice received from the operative carpenters' and joiners' society are as follows:—Wages to be 10d. per hour instead of 9d. Overtime is to be paid at the rate of 1s. per hour for the first four hours, instead of 10d. for the first five hours, as at present; and afterwards at double time (1s. 8d. per hour), instead of 1s. per hour as at present, until the next starting time, and including Saturday after 12 noon. The five hours "overtime" are now computed after working a full working week, but the notice has eliminated the words to that effect. During August Bank Holiday (building trades holiday), the rate of pay is to be 1s. per hour, instead of 10d. as at present. The payment of wages to commence at 12 noon on Saturdays, instead of "not later than 12.15 p.m.," or, in the case of men leaving or being discharged from the employ, at the termination of the legal notice. Starting time: The clause whereby on a job, within a 3½ miles radius, "the workmen must, on payment of the return fare by the employer, travel by the car or train leaving the terminus or station at the first time immediately preceding the starting time of work," has been altered to the starting times stated in Rules 1 and 2. Outside jobs: The following addition has been made to the present rule:—"All workmen on outside jobs to cease work in time to be at the shop at 12 noon on Saturdays, even though wages are paid on the job, and in such case wages must be paid either before or immediately after the men cease work." Country jobs: Employers are to be allowed to start men on the job when such job exceeds three and a half miles from the shop, and not the Wigan Market Place as at present.

The concessions allowed to the employers in the piecework and prepared woodwork rule last year have been deleted, and the limitation of apprentices, which only came into operation for the first time on May 1st this year, and which now stands at 1 apprentice to 2 workmen, has been increased to 1 apprentice to 3 workmen. The arbitration rule has also been amended in the notice.

The annual meeting is to be held on Thursday, November 18th, when the appointment of officers for the ensuing year will be made.

Yorkshire Federation.

BRADFORD ASSOCIATION.

Secretary: J. Davidson.

The monthly meeting of the Bradford Association was held on October 26th, Mr. T. E. Taylor, president, in the chair.

The treasurer presented statement of subscriptions received, and an account was presented for payment and duly approved.

In view of the present condition of trade, it was deemed inexpedient to give any notice to the operatives for alteration of working rules. The chairman gave a very interesting account of the recent meeting of the Yorkshire Federation, and the discussion ensuing thereon was of considerable interest and profit.

A committee was appointed to meet the master plasterers with respect to the appointment of the employers' representatives on the joint committee provided for in the revised agreement with the plasterers.

The sub-contract form as submitted by Mr. Hope for the consideration of the Yorkshire Federation was considered clause by clause, and a resolution was unanimously passed approving of the form as now submitted.

LEEDS ASSOCIATION.

Secretary: J. Davidson.

A general meeting was held on October 12th. Mr. O. Mawson, vice-president, occupied the chair, and was supported by several members. The secretary was instructed to approach the secretary of the Master Plasterers' Association with respect to the apportionment of employers' representatives on the joint committee provided under the revised plasterers' agreement.

The Operative Bricklayers' Society had called the attention of the association to works on which a member was alleged to be permitting masons to execute work usually done by bricklayers. The member in question had written to say that the matter was only a trivial one, but now that his attention had been called to it, he would see that it was duly remedied.

The treasurer's report was presented, and several accounts were considered and ordered for payment. The minutes of the Yorkshire Federation were considered, and the matters of interest arising thereon were thoroughly discussed.

Officers were nominated for the following year, and the date of the annual meeting was fixed for November 16th.

A meeting of the General Committee was held on October 20th, when it was decided, after careful consideration, to give the masons, bricklayers, and labourers notice for alteration of winter working hours, with a view to work being commenced after breakfast, and thus avoid an early break after commencement of work. It was also decided to give notice for an addition to the rules to provide that the party receiving notice shall be at liberty within fourteen days of receiving such notice to send in a counter-notice. Both these alterations had been informally discussed with the operatives at the annual meeting of the local Conciliation Board, and from the conversation which ensued the members gained an impression that the alterations would meet with the acceptance and approval of the operatives' societies.

During the municipal election campaign, several references have been made to the Works Department of the Leeds Corporation, and the secretary was instructed to write a letter to the local Press, stating the satisfaction of the members at the increased volume of work which had been let by contract during the past year, and expressing the hope that this procedure will be still further extended.

YORK ASSOCIATION.

Secretary: J. Hague, Solicitor.

An executive meeting of the York Association was held at the Old George Hotel, Pavement, on Thursday, October 28th. The Lord Mayor of York (Alderman J. Birch) presided over a good attendance.

The chairman mentioned the decease of Mr. J. Hobson, who had been a valuable member of various committees. A resolution of sympathy with the widow and family was carried, and the secretary was asked to send a suitable letter of sympathy to the relatives.

The question of inviting the Federation to hold their next meeting in York was mentioned. The president said he would be glad to place the city council chamber at the Federation's disposal, and, on behalf of the Lady Mayoress and himself, to invite the delegates to take tea with him at the Mansion House afterwards. It was afterwards found impossible to invite the Federation next month, and, the December meeting always being held in Leeds, the secretary was instructed to write to the Yorkshire Federation secretary inviting the Federation to hold a meeting in York on a suitable date early in the new year.

The sub-contract form, as re-drawn, was carefully considered in detail and approved. It was suggested that if a hard-and-fast agreement were to become general, a clause might be inserted giving a sub-contractor the right to be present with the surveyor on completion, and measure up his sub-contract work. It was suggested that the matter might be raised at the next Federation meeting by our delegates.

The secretary reported that no local branch of master plasterers was now in existence, and the masters' section of this committee would therefore be appointed solely by the local builders' association. Mr. Biscomb proposed, Councillor Mansfield seconded, and it was unanimously resolved that the secretary should write to the secretary of the Operative Plasterers' Society that this association considers four representatives on each side a suitable number, and that if they agree to this number the joint committee be so constituted, with Messrs. J. R. Cram, T. Morris, G. Rawling, and G. Young as the masters' section.

With respect to Federation subscriptions and the National Reserve, correspondence on this subject received since last meeting from the Yorkshire Federation was read, and it was reported that the current subscription had been already forwarded; but with regard to the National Reserve it was resolved that we forward a further subscription before next meeting. Mr. J. W. Biscomb moved that the matter be put on the agenda for next meeting with a view to arrangements being made for a further collection for the Reserve Fund, which it was important should be well supported. The motion was carried unanimously.

The draft model of a fair wages clause in contracts, as approved by the National Administrative Committee, was read and discussed, and unanimously approved.

It was resolved that (in order that the representatives to the Federation for 1910 should be appointed in time to report for the Federation's December meeting) our next executive be held on November 30th next, at which nominations should be made; the representatives to be elected at the annual meeting, to be held the week following, viz., December 7th.

The secretary made his report with respect to advertisements on the local calendar, and Mr. W. Biscomb proposed, Mr. J. W. Biscomb seconded, and it was carried unanimously, that the secretary be empowered to make all arrangements for the letting of spaces for next year.

The question of papers or social meetings was ordered to be put on the agenda for further consideration next month.

Northern Counties Federation.

SOUTH SHIELDS ASSOCIATION.

Secretary: J. G. Robertson.

The annual meeting of the South Shields Association was held in the Victoria Hall on Tuesday, October 26th, Councillor J. T. Armstrong presiding over a representative attendance.

Mr. A. Ross (hon. treasurer) presented his annual balance sheet, from which it was shown that the branch, despite heavy calls, is in a strong financial position. After it had been moved and seconded, his report was adopted with acclamation.

The Secretary's report was mainly a review of the year's proceedings. It recounted the difficulties with the water company, with respect to their new by-laws, and the threatended conversion of the dry-earth closets into water-closets. It also touched upon the value of the inter-trading rule as already proved in the branch, the report urging that the rule should be put in force, and not allowed to remain as a mere recommendation. The question of unfair conditions of contract was referred to, and the value of the telephone card was emphasised. A passing reference was made to the stamp duty. A strong plea was made for all members to become subscribers to the "Builders' Journal," special emphasis being laid on its value to the Federation.

The membership had increased, and although the building trade had been in a very depressed state during the twelve months, the branch was in a very strong and flourishing condition.

After discussion, it was agreed, in view of the events that would take place during the next year in the town, that it was undesirable to make any change in the officers for the ensuing year, and they were accordingly reelected:—Councillor J. T. Armstrong, President; T. Anderson, sen., vice-president; W. V. Jary, junr., vice-president; and A. Ross, honorary treasurer.

The Chairman, on behalf of the other officials and himself, returned thanks for the honour of re-election, and pleaded strongly with all the members to take a more active interest in all the affairs of the branch, asking for a regular and loyal attendance at all meetings, without which it was impossible to carry on the work of the branch as it ought to be conducted.

On the motion of Councillor W. J. Robertson, seconded by Mr. J. J. May, a hearty vote of thanks was accorded to all the officers for their valuable services during the past year.

Representatives were then elected to both the Northern Counties and Blyth and Tyne Federations.

A long discussion, initiated by the secretary, ensued, re the best method to get all members to subscribe to the "Builders' Journal." It was agreed, by the adoption of an amendment to a motion, that every member be circularised that he can now get a copy of the "Builders' Journal" at 5s. per annum, the remainder of the subscription coming out of the branch funds.

It was resolved to hold the annual whist drive and dance in December, and the former committee were re-appointed to make the necessary arrangements. Another effort is to be made to induce the four or five builders who are not members, to become members.

A recommendation was made from the meeting to the Tyne and Blyth Federation to put the inter-trading rule into active operation. It was believed that it would be better done by the Federation than by the branch acting alone.

Two new members were elected.

An effort is to be made to secure a permanent meeting place for the Association.

The Newport Association have fixed the date of their annual dinner for December 14 next at the King's Head Hotel, at 6.30 p.m. Tickets may be obtained of the Secretary, Mr. Richard Richards, "Mount Eveswell," Newport.

Midland Centre.

COVENTRY AND DISTRICT ASSOCIATION.

Secretary: W. Ivens.

It having come to the knowledge of Coventry and District Association that the City Council had decided to hold monthly meetings instead of fortnightly, and it being inferred that consequently building plans would only be considered monthly, the following letter was sent, with the result that a Plans Sub-Committee is to be appointed to meet fortnightly, and to notify builders when their plans have been approved or otherwise.

The letter, which is signed by Mr. Charles Garlick, president, and by the hon. secretary, is as follows:—

"We understand it is proposed in future that plans for buildings, etc., will only be approved once a month. May we be allowed to point out to you that this will cause great inconvenience and loss, not only to contractors, but to anyone erecting new buildings, especially workshops or factories. It is often found, in dealing with old buildings, that first plans for various reasons cannot be carried out, and amended plans have to be submitted after the work has been commenced; and to be compelled to wait a month for approval would be a great inconvenience. It sometimes occurs, in dealing with property in the older parts of the city, that nothing is known with certainty of the position of drains. Plans are prepared, and work begun, only to find that the main drain is somewhere else, and in consequence amended plans have to be approved. To wait a month in such cases would be impossible. We respectfully beg that plans will be inspected for approval at not longer intervals than once a fortnight."

NORTHAMPTON ASSOCIATION.

Secretary: A. L. Airs.

The annual dinner of the Northampton Master Builder's Association was held at the Peacock Hotel, and was a very successful gathering. The president (Mr. R. W. Harris) was in the chair, and among the guests were the Mayor (Councillor J. Brown), and Councillor H. Martin, J.P.

After the loyal toast, given by the chairman, Mr. A. Smith submitted "The Mayor, Magistrates, and Corporation."

The Mayor, in responding, remarked that the town was one of the healthiest, and he thought one of the best conducted, and they wished to attract people to reside in the town who had made money, and he hoped the building trade would have a busier time than for years past.

Councillor H. Martin, J.P., also replied.

Mr. Henry Green, submitting "The Architects," suggested that architects should only ask for bills of quantities from successful competitors, and should seal the quantities up till settlement, and not let them lie about in their offices for everyone to see.

Mr. J. A. Piccaver said he always made a practice of sealing tenders until one was accepted, and thought that was the general practice.

Mr. John Brown, jun., said the architects had to face a difficult problem. The client wanted a £2,000 job done for £1,000, and the builder wanted £3,000 for it, and the architects had to make boths ends meet. The architect had no use for the quantities. He also disliked the idea of deposits from builders for quantities. Mr. Frank Allen thought the builders' associations were strong enough to over-ride the architects if they tried on the quantities point.

Mr. S. S. Redwood, of Luton, proposed "Success to the Builders' Association." The success of the building trade depended on the success of the other trades, and he hoped and believed trade was getting better.—The President replied.

Mr. W. Heap welcomed "The Visitors," and Mr. J. F. Stops, Mr. J. Molde, and Mr. H. Hall, made acknowledgment.

Mr. J. J. Martin gave "The President," and eulogised Mr. Harris's services to the association, and the Chairman replied. He appealed to the younger men to attend the meetings.

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Mr. Harris referred to Mr. Amphlet's visit when he attended Northampton to enlighten the association on the use and working of a local conciliation board.

Mr. John Bird gave "The Vice-president," and Mr. A. M. Dunham acknowledged.

The other toasts were "The Secretary," proposed by Mr. Archer, and acknowledged by Mr. A. L. Airs, who referred to architects opening quantities of unsuccessful competitors. He said that a circular on the subject would be sent to all the local architects.

Following is the copy of a letter received from one of our members and addressed to the president of our association:—

The Chairman, Builders' Association,

"DEAR SIR,—I am sorry I cannot attend the meeting to-night, as I wished to report personally a case respecting the exemption clauses for vehicles used for business purposes.

"Last Saturday, one of my vans was stopped coming into town, when bringing men from a country job. The van was examined and comment made that there were no goods in the van. On Monday I received a visit from the police, who asked me a number of questions and told me that they *caught* our man bringing the van into Northampton with a load of men, which was contrary to the law relating to the licensing of vehicles. Naturally I was astonished, as we are constantly sending men to jobs and bringing them away. I am told I am liable to a fine, and that the exemption clauses only relate to vehicles that are delivering goods. I think this will be news to all of you, as this does not affect me alone, but everyone connected with the building and decorating trade, and also other trades. If this is the interpretation of the law, and it were necessary in our case to send men out with the goods to fit up, say, 10 or 15 miles in the country, and, having delivered these goods, we may not in an unlicensed vehicle bring the men back again!

"I asked the police why they take me as an isolated case, when they might find so many others, and I understood that they *caught* one or two others, and doubtless would catch others later on. Naturally I resent this term *caught* very much, and I think you will, too. It does not speak much for the police force if this Act, which has certainly been in existence 20 years, has not produced more cases of this kind.

"In mentioning the case to the society, I am quite sure you will give it careful consideration.

"I have not received my summons yet, but will notify your chairman as soon as it arrives."

Scotland.

EDINBURGH, LEITH, AND DISTRICT BUILDING TRADES ASSOCIATION.

Secretary: James Cameron, Solicitor.

The monthly meeting of the executive of Edinburgh, Leith, and District Association was held in the Building Trades Exchange, 61, Lothian Road, Edinburgh, on Thursday afternoon, October 28th. The minutes of the previous meeting having been adopted, the secretary proposed Mr. John Hay, builder, and Messrs. Forbes and Co., roofing contractors, for membership, and they were duly admitted.

The report on the state of trade showed it to be about the same as last month, and if anything, worse than last year at this time.

Some discussion took place as to a reduction in wages in the several branches of trade, and the secretary submitted reports he had received from Glasgow, Aberdeen, Dundee, Inverness, Paisley, Oban, and Dumfries as to the rates of wages and probability of a reduction in these towns. It was agreed to postpone further consideration until the Executive meeting in December.

Messrs. J. M. Scott, and J. D. Burn were appointed as delegates to the National Registration of Plumbers.

A design for a crest for the Scottish Building Trades Federation was submitted and approved.

The secretary communicated several points of interest arising out of the National secretary's report to September 30th, particularly with regard to the arbitration clause in conditions of contract, and the recent legal decisions arising thereunder. He also reported on the international facilities for students.

The annual dinner was fixed for Tuesday evening, December 7th, to be held in the Royal British Hotel.

The secretary referred to the policy of the Leith School Board in connection with the two schools now being erected for that body. It appears that some time ago they decided to have these schools built on the Doeker principle, and sent the order direct to Germany, without asking local (or even British) builders to tender for the work. As the whole question is one which affects the Edinburgh and Leith building trade in general, and those members of the trade who are ratepayers in the Burgh of Leith in particular, a joint meeting of the Building Trades' Association and Building Trades Exchange was arranged, in order to consider the whole matter, and to take such steps as might to deemed proper and expedient.

Late Reports.

MIDDLESBROUGH ASSOCIATION.

Secretary: Walter Rigby.

The monthly general meeting of the Middlesbrough Association was held in the Corporation Hotel on Wednesday, November 3. The president took the chair, presiding over a fair attendance of members

A letter was read from Mr. W. H. Hope, in reference to the publication of a Northern Counties' Federation year book. The letter explained "that the book would contain among other items of interest to the building trades, the lists of officers and members, also the rules of the local Associations in the Northern Counties."—The proposal met with hearty approval, and it was decided to purchase a copy for each member of this Association.

It was decided to hold the annual meeting on Wednesday, December 15th. Following the meeting a "smoker" is to be held, at which a presentation to Mr. C. Griffiths will be made. Mr. Griffiths has rendered valuable services to this Association. For several years he held the secretaryship, and on resigning that office took up the duties of treasurer, which position he held till May this year

It is with very great regret that we record the death of Mr. Henry Allison, senior partner in the firm of Messrs. Allison Bros., builders and contractors, Middlesbrough. Messrs. Allison Bros. have been in business in Middlesbrough for just over forty years, and were among those who about 12 years ago founded this Association. The firm has always been at the service of the Association in the promotion of builders' interests. The junior partner, Mr. T. Wilkinson, has seen much Federation service, and is president of the Northern Centre Conciliation Board. The funeral of Mr. Allison took place on Monday, November 8th. Mr. J. Davison (president), Mr. W. H. Hope (secretary), Northern Counties' Federation, were present; also Mr. T. Brown, Mr. W. Johnson, Mr. Alcock, Mr. W. C. Creasor, of Stockton, Mr. W. Masters, president Middlesbrough Association, and many Middlesbrough builders.

NEWPORT (MON.) ASSOCIATION.

Secretary: R. Richards.

His Worship the Mayor, Councillor Wm. Blackburn (ex-president of the Association, and a member of the National Council, and past president South Wales Building Trades' Federation), invited his colleagues of the above Association to take part in the Mayoral procession and Divine service on Sunday, November 14th, at St. John's Church, Maindee, Newport, the Association being given a place in the official programme of the procession.

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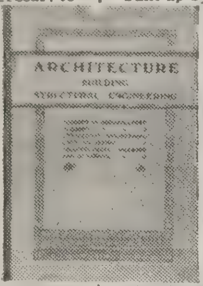

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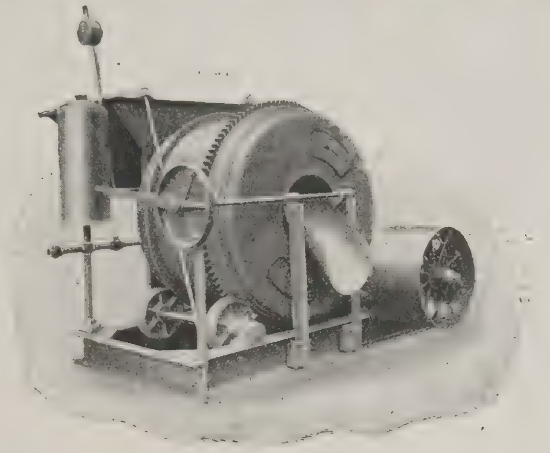

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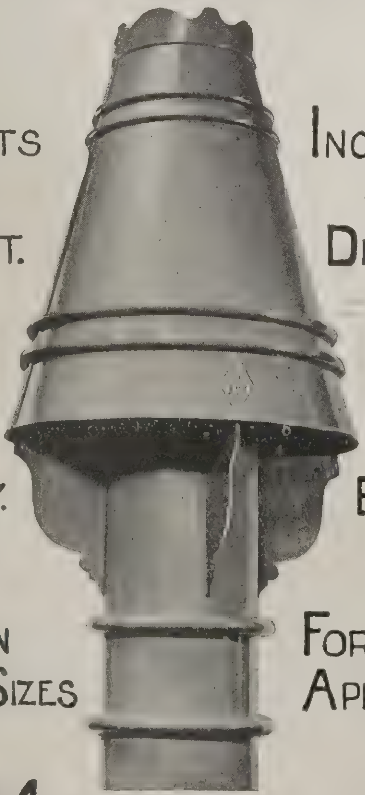

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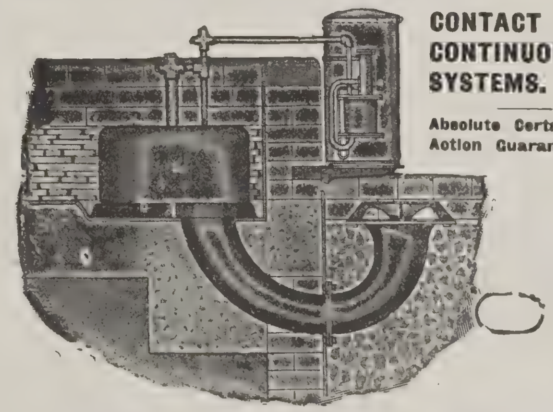

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Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bodmin.—For erection of proposed new East Cornwall Hospital, Bodmin, in Rhind Street, Bodmin. Mr. Morley B. Collins, Architect, Clinton Road, Redruth.

Trehane and Son, Liskeard	£3,130
C. J. Ham	2,735
R. Grose	2,700
Lapthorne and Co., Plymouth	2,598
Brown and Son	2,545
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Stanbury, Devonport	3,449
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Rest of Bodmin.

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Bristol.—Accepted for erection of house at Aldmondsbury, for Mr. Robert Todd. Mr. W. H. Watkins, A.R.I.B.A., Architect, 15, Clare Street, Bristol:—

P. G. Hawkins, Thornbury, £782.

Bristol.—Accepted for erection of new house, Downs Park West, for Mr. T. L. Pearson. Mr. W. H. Watkins, A.R.I.B.A., Architect, 15, Clare Street, Bristol:—

T. Lovell and Sons, Bristol, £1,650.

Bristol.—For alterations and extensions to premises at Queen's Road, Clifton, for Messrs. J. Cordeux and Sons. Mr. W. H. Watkins, A.R.I.B.A., Architect, 15, Clare Street, Bristol.

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Bristol.—For erection of new motor garage at Westbury-on-Trym, for the Bristol Tramways and Carriage Co., Ltd. Mr. W. H. Watkins, A.R.I.B.A., Architect, 15, Clare Street, Bristol.

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Ridd and Sons	1,647
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H. Munday, Havant, £486.

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A. G. Limb	410	10	0
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Sewell (withdrawn)	361	0	0

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Glyncorrwg (Port Talbot).—For building abutment, retaining and parapet walls, for a steel bridge at Glyncorrwg, for the Urban District Council. Mr. W. P. Jones, Engineer and Surveyor.

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D. Lloyd	703
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Barnes, Chaplin and Co.	681
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(*Tenders continued on page viii*)

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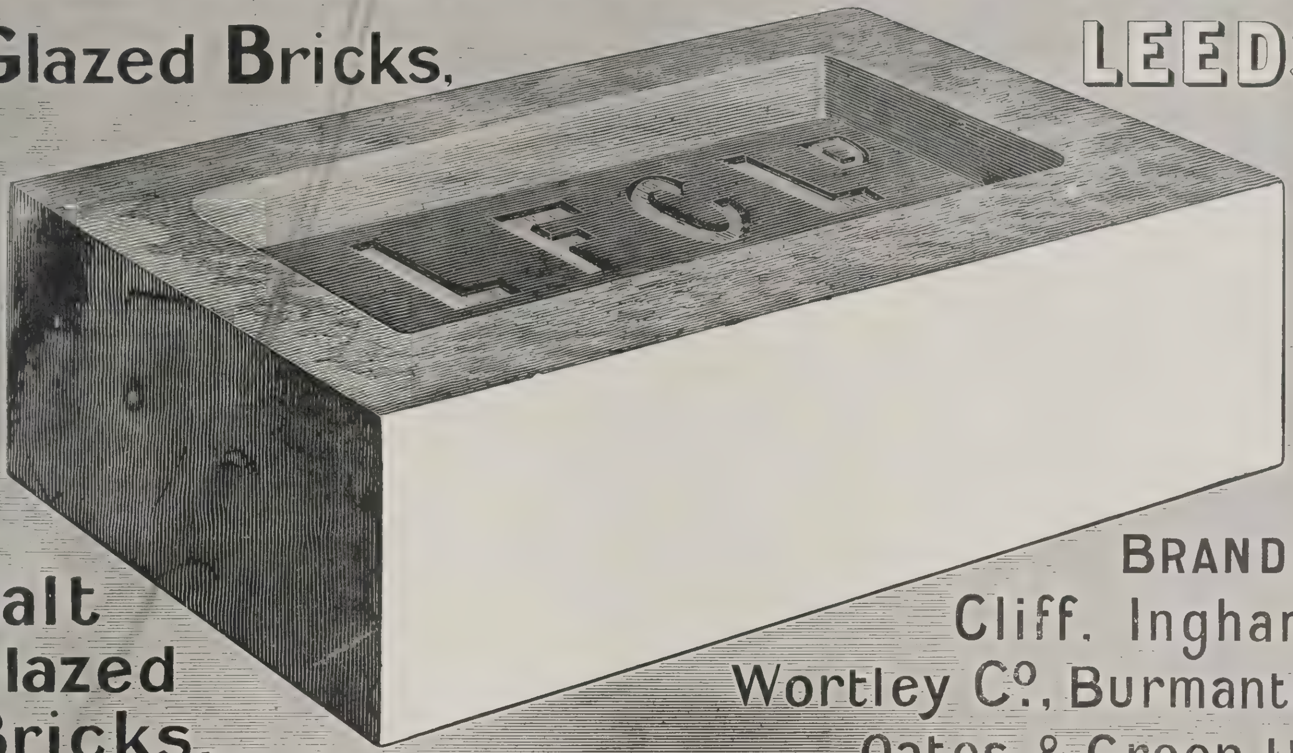

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(Tenders continued from page vi.)

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H. W. Parker and Co., Victoria Street	12,175
H. Marrows, Garden Street	11,960
F. T. Salmon and Co., Cudworth, near Barnsley	11,660
Hewins and Goodhand, Eleanor Street	11,480
W. Kirton*	11,200

Rest of Grimsby.

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Kingswood (Bristol).—For extension to boot and shoe factory at Kingswood, for Messrs. E. W. Pratt and Co. Mr. W. H. Watkins, A.R.I.B.A., Architect, 15, Clare Street, Bristol.

	£	s.	d.
Ridd and Sons	£1,349	0	0
Clarke and Sons	1,220	0	0
Edwards Bros.	1,210	0	0
Lovell and Sons	1,179	10	0
Cowlin and Sons	1,179	0	0
Adams and Jefferies	1,170	0	0
Marsh and Stone	1,150	0	0

All of Bristol.

Linthorpe (Middlesbrough).—Recommended for acceptance for erection of the Kirby Secondary School at Linthorpe, for the Middlesbrough Education Committee:—

W. A. King and Sons, Ltd., North Ormesby, £7,309 0s. 7d.

London, E.—For erection of the proposed new fire station in Parnell Road, Bow, in substitution for the fire station in Globe Road, Bow, for the London County Council.

G. Munday and Son, 9, Botolph Lane, Eastcheap, E.C.	£10,536
Higgs and Hill, Ltd., Crown Works, South Lambeth, S.E.	10,416
Leslie and Co., Ltd., Kensington Square, W.	10,319
C. Wall, Ltd., 4, Lloyd's Avenue, E.C.	10,300
F. and H. F. Higgs, Station Works, Hinton Road, Herne Hill, S.E.	10,290
Kirk and Randall, Warren Lane Works, Woolwich, S.E.	10,200
Holloway Bros. (London), Ltd., Belvedere Road, S.E.	10,070
J. Carmichael, 331, Trinity Road, Wandsworth, S.W.	10,407
W. Smith and Son, Harleyford Road, S.E.	10,000
W. Johnson and Co., Ltd., Wandsworth Common, S.W.	9,938
Perry and Co., Tredegar Works, Bow, E.	9,829
H. L. Holloway, Church Street, Deptford, S.E.	9,677

Architect's revised estimate, £10,071.

*Recommended for acceptance.

London.—For a new school at Haverstock Hill, for the London County Council.

	£	s.	d.
W. Moss and Sons, Meadway, Hendon	£13,294	10	6
L. H. and R. Roberts, 34, Rheidol Terrace, Islington	12,789	0	0
C. F. Kearley, 4, Great Marlborough Street	12,769	0	0
J. and M. Patrick, Wandsworth	12,672	0	0
T. D. Leng, Evelyn Street, Deptford	12,654	0	0
Patman and Fotheringham, Ltd., Park Street, Islington	12,651	0	0
G. Godson and Sons, Pembroke Works, Kilburn Lane	12,639	0	0
Treasure and Son, Ltd., Cottenham Road, Holloway	12,630	0	0
E. Twiggs, 92, The Chase, Clapham	12,343	0	0
McCormick and Sons, Ltd.,* Northampton Street, Essex Road	11,842	0	0

Architect's estimate, £12,678

*Recommended for acceptance.

London.—For the paving and sewer, etc., works in connection with the widening of Belvedere Road between Westminster Bridge Road and Guildford Street, for the London County Council.

	£	s.	d.
S. Kavanagh and Co., Surbiton Hill	£4,764	5	3
W. H. Wheeler and Co., Ltd., Blackfriars Road, S.E.	4,619	2	7
F. and H. F. Higgs, Loughborough Junction, S.E.	4,476	0	0
Price and Reeves, Waterloo Place, S.W.	4,303	15	3
H. Woodham and Sons, Catford, S.E.	4,168	10	3
W. Muirhead and Co., Victoria Street, S.W.	4,168	6	2
C. Ford, Harlesden, N.W.	3,758	1	4
J. Mowlem and Co., Ltd., Westminster, S.W.	3,717	7	0
D. R. Paterson, Ltd.,* Camden Town, N.W.	3,283	2	7

Chief Engineer's Estimate, £3,067 8s.

*Recommended for acceptance.

London.—For erection of handicraft, metal work and laundry centres on the "Acland" site (St. Pancras), for the London County Council Education Committee.

Marchant and Hirst, 136, Highgate Road	£3,464
Stapleton and Sons, 112, High Street, Stoke Newington	3,168
Brand, Pettit and Co., 247, West Green Road, Tottenham	3,166
G. S. S. Williams and Son, Richmond Street, Barnsbury	3,091
J. Willmott and Sons, Hitchen	2,942
Patman and Fotherington, Ltd., 15, Park Street, Islington	2,807
C. R. Price, 139, Bishopsgate Street Without	2,777
Stevens and Sons, Yonge Park	2,761
C. F. Kearley, 4, Great Marlborough Street	2,757
Treasure and Son, Ltd., Cottenham Road, Holloway	2,696
McCormick and Sons, Ltd.,* Northampton Street, Essex Road	2,669

Architect's estimate, £2,747.

*Recommended for acceptance.

Pensnett (Staffs.).—Accepted for the erection and completion of the Bird's Meadow Council school, for the Staffordshire Education Committee:—

H. Gough and Sons, Wolverhampton, £3,100.

Westerhope.—Accepted for the work of erecting a new infant Council school to accommodate 150 scholars, at Westerhope, near Newcastle-on-Tyne, for the Northumberland Education Committee.

W. R. Jameson, Kenton, Newcastle-on-Tyne, £1,356 1s. Sixteen tenders received.

TO CONTRIBUTORS.

Owing to the very large number of voluntary contributions submitted to the Editor, it has been found desirable to make the following regulations:—

1.—Intending contributors are advised to send a preliminary letter before forwarding articles and illustrations. The non-receipt of a reply within one week is to be taken as a polite negative. MSS. and drawings in all cases should be accompanied by sufficient stamps to cover return postage.

2.—The Editor declines to take any responsibility for the safety or return of contributions submitted, although every care will be taken where these regulations are complied with.

3.—Each MS. and illustration should bear the name and address of the owner or sender.

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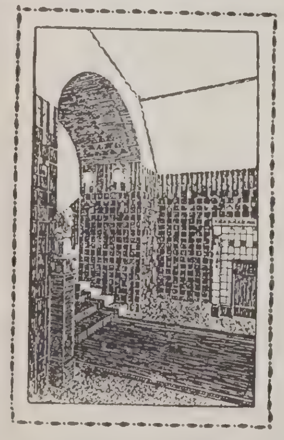

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November 24, 1909.
Volume 30, No. 772.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

This issue contains Articles on Fire-resisting Construction and Fire Prevention.

Caxton House, Westminster.

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Builders' Quantities.

The recent discussion by the London Master Builders' Association on the subject of Builders' Quantities, has aroused feeling in a quarter from which one would least expect it. The grievance of the builders, to which we drew attention in our issue of October 20th, is a very acute one in these days of keen competitive tendering. If architects refuse to supply quantities to the builders, those quantities must be taken out by the builders themselves, and at their own expense. If there are fifteen builders tendering under such conditions, only the successful one can get back the cost of quantities from the client; the other fourteen incur a dead loss, which goes to swell their establishment expenses. It is against this imposition that the builders complain, and not without good reason. Yet our contemporary "The Builder," whose title would lead one to expect sympathetic consideration of this matter, pooh-poohs the grievance, sneers at the "hardship" which Mr. Godson enunciated, and finds the purely academic discussion of the master builders one of "some bitterness." We are told that quantities are nothing to the architect or the client; that they have no interest in "how many thousand bricks are used" in a wall, "or what is the length in foot run of a cornice." This is only a half-truth. The ultimate aim of both the client and the architect is to obtain a building "of a special design, dimensions, and materials" without doubt; but as the client has to pay for the materials, and the architect to see that he gets them, neither can afford to disregard any one of the essential processes by which the building is produced. Moreover, as both clients and architects frequently desire to vary the "special design, dimensions, and materials" of their buildings, they cannot well ignore the one document that gives them the opportunity of doing this on terms that shall be equitable to all three parties to the contract. The admission that "the system of competition tendering is at the root" of the necessity for quantities, and that "as long as this system is general the position must probably remain unaltered," is only another way of saying that we are now in the twentieth century, which brings its own special crop of difficulties requiring solution. This matter of builders' quantities is but a small matter, an incident in the progress of modern building operations, and mainly confined to the South of England. It is in no sense revolutionary or any object for heat and denunciation, nor has it been regarded by the builders as more than one of those subjects upon which they might approach the architects in friendly conference, in the same way that the national form of contract was discussed and drawn up. "We can hardly suppose," says our contemporary, "that a builder who had taken out quantities in order to make an estimate, would omit to add something to the estimate in consideration of that." Exactly; he does. But this fact does nothing to mitigate the losses of all the unsuccessful tenderers, and this is the whole bone of contention. The contractor asks that he shall be furnished with quantities taken out by an independent surveyor employed by the client. This places him on an equality with all the other builders tendering; it prevents mistakes and avoids the unnecessary and uneconomical duplication of labour. If, as "The Builder" suggests, the successful contractor makes his client pay the cost of preparing the quantities, the client is no loser by having them prepared beforehand, except as to the insignificant extra cost of duplicating the quantities for the various builders who desire to tender. We are quite sure that any builder would be prepared to pay the shilling or two which is the intrinsic cost of the copy handed to him. He is quite content to "drive off into the hands of a surveyor a little bit of business" because "the legitimate profit" he makes on quantities in contracts he secures is swamped many times over by the losses accruing in the more numerous cases in which his tender is unsuccessful.

Another Garden Suburb.

It must be a sore trial to garden city enthusiasts that their beneficent aims and programmes are so often clipped and shorn by the exigencies of the money question. Enthusiasts are seldom blessed with means sufficient to encompass their desires, and consequently their ideals are almost inevitably subjected to the wiles of the mere commercial person. "Garden City" is an alluring title that conjures up visions of white buildings with spires and domes that glisten under the sun against backgrounds of green and an azure sky; whereas the result so often is an improved form of cottage housing set out on roads of the ordinary suburban kind. For by the time the land is purchased and laid out, the funds of the enthusiasts are exhausted; the land must be leased and the lessees are rarely men who will embark on a grandiloquent building scheme for the mere sentiment of the thing. Consequently the grand boulevard fails to rise above the level of a suburban street; the shopping centre lacks the attractiveness of, say, Regent Street in London, or Princes Street in Edinburgh; and the civic centre bears a close resemblance to the civic centres of those land-boom cities of the Western States of America. A report in the daily Press gives one hope, however, that a new garden suburb, to be commenced immediately at Winchmore Hill near Enfield, will be carried through without these difficulties. The arrangements sound most promising. The estate, of some 300 acres, is ringed round with country lanes, and is heavily timbered. Not a tree is to be cut down except where actually necessary for the making of roads and the erection of houses. A central park is to be provided for the inhabitants; the old mansion will become a club, and the lake of eight acres will be kept for boating, fishing, and swimming. Fences will be prohibited; all divisions being marked by shrubs. The houses will be designed by the best architects, the cheapest to cost £550, and the estimated capital required, £2,000,000, is apparently available. It really looks as if house building was at last getting into enlightened hands, and we shall await, with interest, further particulars of the scheme.

Builders and the Budget.

The following paragraph has been circulated in the daily Press: "A representative meeting of builders from all parts of London has carried a resolution of protest against the Increment Duty, the Undeveloped Land Tax, the Reversion Duty, and the increased Stamp Duties in the Budget. The resolution has been forwarded to the House of Lords. The builders also decided to bring into existence a Federation of Master Builders and Workers in the Building Trade to watch over the interests of the trade generally, and all builders and their workers were invited to join." The announcement might, or might not, have more force if it were less vague. The absence of definite particulars makes it an example of reticence which we have no option but to follow. It seems necessary to point out, however, that there is one respect in which the paragraph may be misleading. The statement that it has been decided "to bring into existence a Federation of Master Builders and Workers in the Building Trade to watch over the interests of the Building Trade generally," cannot be allowed to pass unchallenged. It calmly ignores the fact that a Federation of very similar title, and whose objects might be expressed in identical terms, has long been in vigorous being. To prevent very possible confusion, it may be here stated categorically that the National Federation of Building Trades Employers of Great Britain and Ireland is in no way responsible for the circulation of the paragraph in question, and whether or not the majority of its members are in sympathy with the objects set forth—which is a separate question—has a right to object to this unauthorised use or imitation of its name. To those who are acquainted with the Federation, this disclaimer may be unnecessary; the suggested conjunction of incompatibles contained in the last line affording perhaps a sufficient hint that the proposed league must be a thing apart. The choice of a title is presumably provisional. It is also unfortunate, in so far as it appears to clash with the honourable style and title of the National Federation, which, as we have already stated, is in no sense responsible for the somewhat ambiguous announcement. Imitation is in this instance a somewhat embarrassing form of flattery.

Nottingham's Notable Example

An association of master builders, or any similar organisation, is in but little danger of losing sight of the objects for which it exists, and for which it was called into being. But such an organisation may "fulfil itself in many ways." The direct forward movement of most of the pieces on the board may be greatly aided by the knight's gambit. There are, it may be supposed, many ways in which an organisation may gain in influence and power by showing that it is not a mere machine, but a thoroughly human institution. This larger view is exemplified by the Nottingham Master Builders' Association, which is showing, in various ways, a keen interest in the technical education of the builder. Under its auspices, Mr. G. M. R. Layton, B.A., of the Associated Portland Cement Manufacturers, has delivered, at University College, Nottingham, a lecture on Portland Cement, the chairman on that occasion being Mr. Robert Evans, J.P., F.R.I.B.A.; later, under a joint invitation from the Association and the University College, Mr. William Dunn delivered a lecture on Reinforced Concrete, a subject on which builders are wisely anxious to obtain all available information. In each case the lecture was illustrated by lantern slides. Further, the Association offers a guinea and half-a-guinea as first and second prizes to those students of building construction who, being apprenticed to any of its members, obtain creditable positions in stages 1 and 2 of the Board of Education examinations, and of a guinea and a half, and half-a-guinea respectively for first and second prizes in stage 3. This seems to us to be an excellent way of encouraging apprentices to render themselves diligent and efficient; of stimulating the interest of employers in technical education; and of putting the Association in a favourable light before both masters and men, as well as in the eyes of an important section of the general public. It is, we think, a legitimate expansion of the scope of such associations, and we should be glad to see Nottingham's example generally followed. Other associations may be reminded that it is not copyright.

Subways and Civic Design.

It is announced that the Lord Mayor of London will open the Blackfriars Bridge subways next Monday. The subways will no doubt prove very useful to those to whom time is not dearer than life; and considering the notoriety of the significantly named "Slaughter Corner," the subways ought to diminish London's death-rate, and to relieve the congestion in the accident wards of adjacent hospitals. The potential utility of the subways is unquestionable. It does not necessarily follow that therefore they need not be made beautiful. The approaches, as we pointed out before the work was begun, afforded an excellent opportunity for decorative treatment. That opportunity seems to have suffered from what, to borrow a strictly Parliamentary phrase, may be regarded as frigid and calculated neglect. We are more pained than surprised to find that the exits and the entrances are simply oblong holes surrounded by plain railings. It is better, perhaps, that the railings should be kept severely plain rather than that they should have been contorted into hideous designs; but while grateful for this small mercy, we cannot help regretting that more encouragement has not been given to the Londoner's growing sense of beauty. Architects having time on their hands might employ it to less advantage than in designing appropriate architectural treatment for the approaches to subways; and if the results of their skill were put before the authorities, it is quite possible that we may yet get something which will add to the adornment rather than to the disfigurement of our streets. The burrowing underground may be purely a matter for the engineer; but the surface treatment (which should not be merely superficial) ought to be placed in the hands of the architect and sculptor. As the idea of civic design becomes more popular, it will dawn upon the authorities that the approaches to subways may be made to assist very materially towards the adornment of the streets.

The Housing Bill.

The safety of the Housing and Town Planning Bill was assured on November 19th, when the House of Lords, after a sufficient show of resistance to enable them to climb down with grace and with dignity, accepted the more important of the points upon which the Government most strongly insisted. This may be taken as a sign that the Bill, as a whole, if not exactly popular in the true sense of the word—for the man in the street is not greatly stirred by it—is yet sufficiently esteemed in influential quarters to render its rejection prejudicial to the case for the Lords that is shortly to be put before the country. The Lords, however, may be credited with having accepted the Bill on its merits, and thus to have fallen into line with the general opinion; for with regard to the main principles of the Bill, apart from details that will doubtless be modified as occasion demands when the measure comes into operation, one hears hardly a dissentient voice. That everybody seems anxious to give the measure a trial is, one is glad to believe, a sign of the awakening consciousness of our backwardness, as compared with other nations, not with regard to the minor question of housing, in which, in spite of our many imperfections, we can still show other countries a lead, but in respect of the larger and broader aspects of civic design. While congratulating Mr. Burns on the happy issue of his almost titanic labours in a field that he has made peculiarly his own, we cannot help adding that these labours might have been considerably lightened, and possibly rendered more fruitful, if he had not so strangely denied himself the help of those who were prepared to give unstintedly and disinterestedly of their skill and knowledge. The measure, when it comes into operation, will, we doubt not, reveal the absence of the professional aid that the R.I.B.A. were prepared to give in much greater abundance than Mr. Burns was prepared to receive it. Then the architects will be called in—as some folk call in the doctor—to apply desperate remedies for ills that might have been easily prevented at an earlier stage.

The Obliteration of Fleet Street.

Although it is not upon the records that Dr. Johnson ever said, "Sir, let us take a walk down Fleet Street," an exhortation of which George Augustus Sala acknowledged the authorship, one can never think of the "Highway of Letters" without mentally seeing Ursa Major as the principal figure in it. But already it is nothing like the Fleet Street that the Doctor knew and loved. It completely lost that character when Temple Bar was removed, and the egregious Griffin was set up in its place opposite the "New Law Courts," the clearance for which destroyed many a Georgian and Johnsonian relic. And now it is to be altered out of all recognition. The Court of Common Council has decided that the very necessary (and very gradual) widening process is to be continued, at an estimated cost of £436,238, towards which the London County Council will contribute £200,000 in yearly instalments of £50,000. This expenditure will, it is stated, "complete the improvement of Fleet Street." It will also complete its obliteration as the scene of one of the most fascinating epochs in English literature. But the widening was inevitable, and we shall become reconciled to it if only the new buildings are of such a character as to compensate us in some measure for the vanished glamour.

San Francisco Rebuilt.

The rebuilding of San Francisco, after the destruction by earthquake and fire in 1906, has proceeded, according to an ingenious calculator, at the rate of one building for every hour and forty-five minutes of time elapsed since the destruction. Building has, in fact, gone on continuously night and day; but it has been done with thoroughness, and with considerable regard for beauty as well as for stability. In particular, the municipal buildings are worthy of the city's position as the metropolis of the western coast. The city hall of justice, gaol, schools, and hospitals, have cost three millions sterling; and a further million is to be spent on the installation of a high-pressure water system for protection against fire. The new buildings are, it may be supposed, all constructed with a special view to the circumstances in which the former city was reduced to ruins. They are of several types, including steel frame with brick, stone, or terra-cotta (or a combination of those materials), and, of course, reinforced concrete How these new buildings would behave under a similar visitation to that which destroyed the old, we are not anxious to find out by the same means! and we trust that the pluck of San Franciscans may never again be put to so severe a trial as that from which they have so triumphantly emerged.

THE PLANNING AND LAYING OUT OF PUBLIC PLACES.*

By H. Inigo Triggs, A.R.I.B.A., Godwin Bursar, 1906.

Some five years ago two papers of considerable interest on the planning of cities and public squares were read in this room by Mr. John W. Simpson and Professor Beresford Pite. The papers, as the writers said, were intended to touch only upon the fringe of the subject and to induce further investigation.

The advent of the newspaper may be said to have abolished the principal reason for which the mediæval public place existed—namely, to hear and discuss the news of the day, and listen to the public proclamations. In like manner, since the gorgeous ecclesiastical ceremonies of the Mediæval and Renaissance church are things of the past, the great church places have no longer the same *raison d'être*.

A demand has arisen for new types of public places, for traffic places that shall effectively receive and distribute streams of vehicles with safety to pedestrians, for monumental and garden places that shall show to the best advantage the buildings that surround them, and for places that shall be useful at the same time for military parades, exhibitions or sporting purposes, sanded or turfed and surrounded by trees, such as the Champ de Mars.

Aviation is making rapid strides, and, as M. Hénard has recently pointed out, the necessity for trial grounds and alighting places will soon make itself felt. It may not be considered too visionary a suggestion that the day may be not far distant when perhaps Hyde Park itself will furnish the site for an aviation place, with gigantic sheds able to accommodate a fleet of dirigibles.

Turning to some of the more important points that may be learnt from a study of town planning in the past, the author thought that one of the first lessons to be learnt is the value of grouping buildings round definite and fitting centres. Sir Christopher Wren strongly emphasised the importance of this in making his plan for the re-building of London. He placed a spacious "rond-point" at Ludgate Circus from which eight streets were to radiate; a triangular space opening up the fine vista of St. Paul's Cathedral, a monumental place at the Royal Exchange, together with five other controlling places at important traffic junctions.

In classic cities the Agora and the Forum invariably formed fitting centres for the grouping of the principal public buildings, and in mediæval towns we always find the public places dominated by some great church or public building. The "Grande Place" at Brussels, with its Hôtel de Ville, the Market Place at Ypres, dominated by the glorious Cloth Hall, or the "Place Verte" beneath the spire of Antwerp Cathedral are all instances in point.

In re-planning Paris, Baron Haussmann and his successors fully realised that more depended upon the placing of structures than upon the structures themselves. Paris has perhaps the most glorious civic centre in the world in the combination of the Louvre and the Tuileries gardens.

In the United States, starting with the examples of Washington and Cleveland, the town planners within the last decade seem to have realised how grand the effect of buildings arranged in a stately manner may be, and that the advantages to be gained by grouping public edifices are not only æsthetic but also tend to convenience and to simplicity of administration and maintenance. Numerous cities are now engaged in formulating plans for civic centres on the lines of Washington and Cleveland, where they seem at last to realise how much of the effect of important buildings is lost when they are scattered indiscriminately about the town, as is the case with the finest public buildings of London, almost without exception.

In this country opportunities for the creation of large civic centres are not likely to occur often, yet each year the growth of our suburbs creates the need for secondary subsidiary centres which require quite as skilful handling as the larger ones. Even the smallest public buildings may be so grouped that they harmonise and help one another both by colour and scale, as in the scheme put forward by Herr Karl Henrici for providing a series of such focal points in the suburbs of Munich. In dealing with the future expansion of London, it would be hard to find a more suitable model or one demanding less drastic alterations to existing streets than such a scheme as this. Hyde Park Corner would be much finer if the five broad roads that enter it could be arranged to converge towards a large semicircular architectural place. This sense of enclosure need not necessarily be obtained by means of architecture, and often a fine effect may be made at very small expense by the skilful planting of trees. In Piccadilly and Oxford Circus, the sense of enclosure is entirely lost, first by the streets being taken straight through the place, and secondly by the large proportion of circumferences given up to the street openings.

Although anything like a studied irregularity is hardly likely to be a success, much might be said against the folly of striving after a perfectly regular and symmetrical effect in places, even where they are surrounded by classic buildings.

The public places of a modern city may be considered from three wide aspects, traffic, business and ornament. Business places, include those various types of place whose principal object is to facilitate the transaction of business, such as the market-place and the garage place in front of railway stations

Photo: T. Lewis.

COTTAGES, WALKER GATE, NEWCASTLE-ON-TYNE. EDWARD CRATNEY, ARCHITECT.

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*Abstract of a paper read before the Royal Institute of British Architects, Monday, 15th November, 1909.

or similar points. Ornamental places include all those laid out solely with the object of adding beauty to the surroundings without any regard to traffic. Architectural places include those which are designed to set off the surrounding architecture to its best advantage. It frequently happens that the fulfilment of two or more different purposes is attained by one public place, as in the Place de la Concorde, Paris, which is both a traffic and an ornamental place, and also in some of the Parisian *ronds-points*, which, besides receiving and distributing the traffic, are adorned with gardens, monuments, and fountains. The Place de l'Etoile is a combination of a traffic and an architectural place.

The ideal form of town plan is the one in which the smallest number of traffic places occur, and it certainly does not add to the ease with which traffic circulates, if it is continually being obstructed by a large number of streams converging to one point. For practical reasons it is desirable that the various lines of traffic should not intersect one another at one point, and where this is likely to be the case this point should be chosen for a pavement or grass plot. High monuments, or any objects likely to impede the drivers' view are to be avoided in such a position.

A very favourite form of traffic place in modern continental cities is the *rond-point* or circus, upon which the thoroughfares converge like the spokes of a wheel. It has been much used where new quarters have to be united to old ones by thoroughfares, and its fullest development has been reached in such examples as the Place de l'Etoile and the Place de la Nation in Paris, planned at the western and eastern extremities of the city. The Place de l'Etoile has a total width of 290 yards between the buildings, the central circular roadway having a width of thirty yards. In the midst of the place rises the magnificent Arc de Triomphe erected by Napoleon in 1806; twelve important thoroughfares, varying in width from the Avenue des Champs Elysées, ninety feet wide, to the Avenue de Jéna, which is only forty feet wide. In addition to the footpath there is a broad gravelled space planted with trees. The surrounding buildings are of one uniform style of architecture, which by a special ordnance of the city can never be changed. An interesting feature of the Place de l'Etoile is the outside ring of side streets, designed to relieve the traffic and to give additional access to the large blocks of buildings surrounding the place. Where the diameter is smaller, and insufficient to allow for the secondary relieving street, the form can hardly be recommended. An ingenious arrangement known as gyratory regulation, first proposed by Mr. Holroyd Smith some few years ago, does not, for reasons which the author is unable to understand, meet with the approval of the powers that be. The author made a suggestion showing the gyratory principle applied to what is one of the most important traffic crossings in London—the junction of the Strand with Wellington Street. He indicated underground passages for pedestrians, but admitted that this system has yet to be proved a success; they do not seem to be much used when provided.

It is often impossible to avoid four or five streets converging. Where this happens, instead of directing them towards a central-point, it is better to form an oblong or an elliptical place, both of which forms are preferable for dividing the circulation of traffic. The Place de la Republique, Paris, is a good example of an oblong traffic place. The half-circle is another suitable form for a traffic place, particularly where traffic coming from one direction has to be spread out, as at the principal entrances to towns, railway stations, bridge approaches, etc. The Piazza del Popolo, Rome, is a good example of this treatment.

It frequently happens that where two important lines of traffic converge to a point, upon what may perhaps have been the boundary of a city, a triangular public place is formed and devoted to the purpose of a village green, as at Shepherd's Bush. Such a position as this would form an ideal situation for a well-planned traffic place. At the present time the stampede that takes place at this point at busy times becomes almost a free fight, and tram after tram has to be laboriously shunted from one line to the other, instead of proceeding in an orderly continuous procession. An improvement might be effected with little difficulty. By a scheme suggested by the author, it would be possible for an ever moving line of trams to circulate easily over the two systems to Ealing and Kew.

The type of business place which on the Continent is known as the garage place, generally planned in front of railway stations, is almost unknown in this country. The railway station is the main entrance to the city, and as such it has taken the place of the old city gates. In America the Railway Corporations are realising that it pays to make station surroundings attractive, and many of the large European cities, like Hanover, Turin, Basle, and Milan, have laid out their garage places in a strikingly beautiful way, in order that the first impression of strangers arriving by rail may be a favourable one. The Bahnhofplatz at Hanover is in many respects a model of its kind; the place is semi-circular in form, and for the better circulation of traffic the central part is laid out as a garden. Three large thoroughfares converge to the outer part of the place and take the traffic to either side of the station, the central roadway being reserved for cab stands and smaller vehicular traffic. As in most cities on the Continent, the railway place is the principal starting place for the entire tramway system of the town.

The author made a suggestion for a terminal place, in front of a station about the size of Victoria. Cab stands are arranged upon either side to take a double row of vehicles easily within hail and at the same time not too much *en évidence*, being partly screened by trees. The tram lines are planned so that this traffic may be kept continually on the move. Those who know the station place at Milan, or the wonderful way in which the trams are planned to circulate in the fine square before the cathedral in the same city, will realise how important this point is. The centre is laid out as an oval garden, with a monumental fountain placed as a termination to the principal vistas. Waiting rooms for trams form part of the design, and a monumental archway gives a sense of enclosure and affords a worthy entrance to a city.

Another form of garage place which is badly required in all our cities is a properly equipped place for the hiring of vehicles. In planning city extensions and improvements all provision for this kind of place is invariably omitted, and for want of better arrangement vehicles for public hire are placed in the centre of roadways or allowed to block up the sides. A good plan is that of the Karlsplatz at Munich, where the cabs are arranged in a kind of recess easily accessible from the footway.

A few of the principal types of architectural place were described, including the Place de la Concorde, Paris. The Place Vendôme; Belgrave Square; the Amalienborg Platz, Copenhagen; the Konigsplatz, Munich; the Lustplatz, Berlin; and the Maria Theresien Platz, Vienna.

The idea of an architectural square of uniform buildings probably originated in Paris, where the Place Royale was laid out by Henri IV. in the early years of the seventeenth century. It is an exact square of 152 yards. From France the idea of the Place Royale was soon imitated in London, where, about 1620, a Commission was appointed by the Crown to "plant and reduce to uniformity Lincoln's Inn Fields as it shall be drawn by way of map or ground plot by Inigo Jones." A few years later the idea was imitated in a grander form in the piazza of Covent Garden. The idea, once started, soon grew into favour, and towards the end of the eighteenth century an increasing demand for dwelling-houses of a more stately character resulted in many large London estates being dealt with as a whole. The usual plan was to form a large open square, to plant trees and shrubs therein, and to design the houses with a view to their architectural symmetry.

To make any attempt at landscape gardening in a town square bounded on all sides by solid blocks of buildings seems hardly like to be a success. The treatment of such a square should be in architectural and formal manner. Any embellishment that it may receive should be monumental in character, such as stone terraces and steps, monuments and statues arranged in harmony with the environing buildings, and disposed in such a way that they will not conflict with the usefulness of the place. If the space permit, a rectangular alignment of shady trees could be introduced, and with just sufficient amount of turf at their base to protect the roots from too hard a surface and also to soften the harshness arising from an expanse of stone or asphalt paving. But the introduction of turf or trees should be completely subordinated to the architectural character of the place, and should be so carefully arranged that the walking space should remain practically undisturbed.

Places Planned as Forecourts to Public Buildings.

Forecourt places are particularly valuable as a means of exhibiting the architecture of an important public building to its best advantage. It is inadvisable that important buildings should be erected in a line with the frontages of the other buildings in the street; and if it is possible to set them back somewhat, an air of greater importance is imparted, and at the same time they gain considerably by being seen in a more favourable perspective. In France the forecourt (*cour d'honneur*) is a very favourite device, and few important public buildings are planned without it. For such buildings as churches, museums, or art galleries a forecourt ensures greater quietude and freedom from dust. Herr Brinckmann has pointed out that classic places differ from mediæval in being almost always treated as forecourts. A fine example of such a place is that planned in front of the Farnese Palace, where several broad streets lead up to a well-proportioned place. The small *piazza* in front of the churches of S. Maria della Pace and S. Ignazio in Rome are both interesting examples of smaller Renaissance forecourts; the former, planned in 1656, is largely occupied by the semi-circular portico of the church. The finest and most monumental place of this kind in the world is that which Bernini planned in front of St. Peter's. The place consists of three parts—the Piazza Rusticucci, surrounded by hotels and shops; the large oval piazza, 370 yards by 260; and beyond that a forecourt with steps leading to the principal entrance. The great piazza is enclosed with an open double colonnade and the forecourt with a closed *logia* of grandiose proportion. The ground level of the oval place falls slightly to the centre; but, beyond, it rises towards the entrance to the cathedral. It was originally the intention of Sir Christopher Wren to surround St. Paul's Cathedral by a colonnade similar to Bernini's treatment of St. Peter's.

The immense courtyards in front of the palaces of Versailles and Caserta are examples of approaches planned upon a vast scale. A very favourite device in eighteenth-century palaces was to spread the approach place out in the form of an immense fan and surround it with dependencies, as at Nymphenburg, near Munich. A far more architectural and dignified form is that of the Schlossplatz at Coblentz, where the palace buildings surround three sides of an inner garden courtyard, the central axial line amounting to over 300 yards. Many of the French eighteenth-century *châteaux* have delightful forecourts that might well be imitated in modern town-planning schemes.

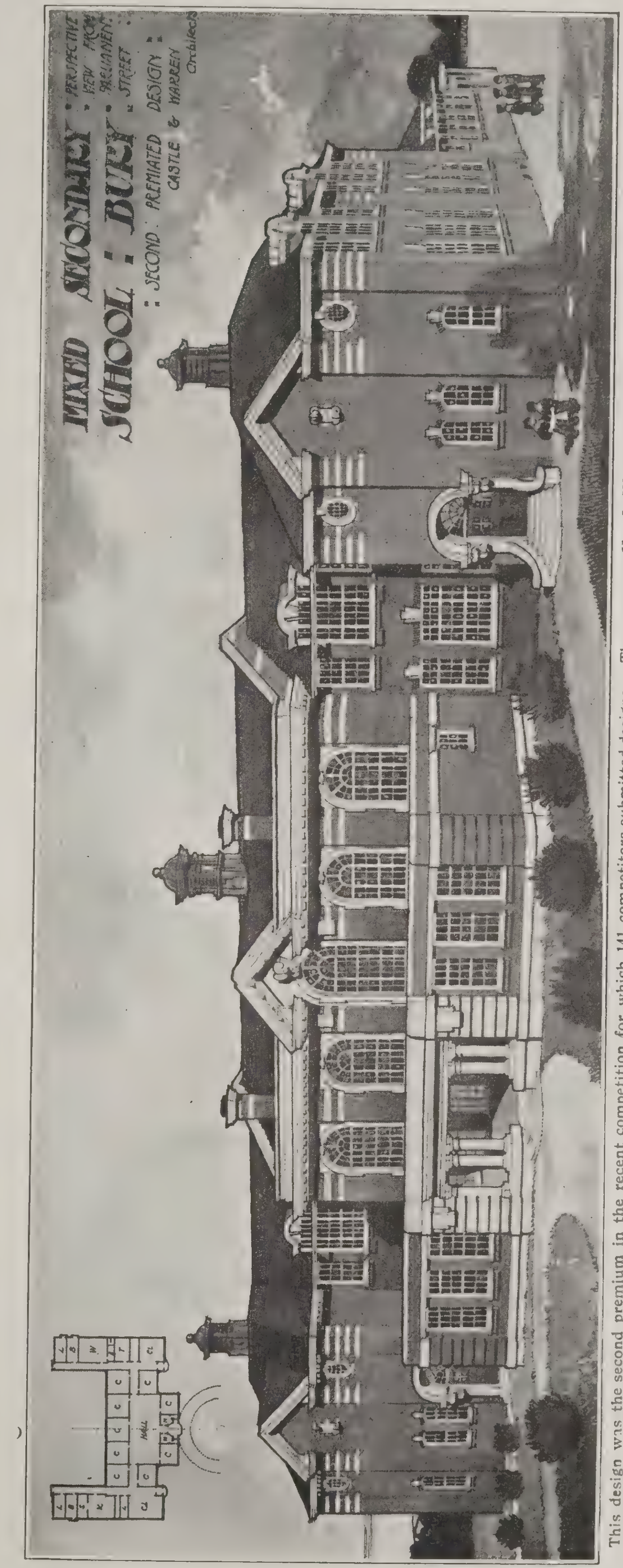
Finally the author dealt with places which are partly built upon. These frequently occur in cities where triangular and irregular sites have been created by intersecting thoroughfares, and are suitable for the erection of such buildings as churches, museums, and picture galleries, whose character demands an important open site on account of their architectural importance and of the necessity of obtaining light on all sides. Extremes of narrowness and width are to be avoided; an exaggerated width leads to a feeling of emptiness which it is not easy to disguise by tree-planting and gardens. This class of place demands skilful treatment where it occurs in a position terminating a vista and forming the meeting-place of several traffic arteries. In this respect most of the best examples are to be found in Paris, where the importance of obtaining a series of imposing street vistas has been better realised than in any other city. In the smaller English towns we often find the market-hall placed in the middle of an open place, as at Abingdon and Peterborough, with a very pleasing effect. In larger examples the traffic requirements demand that the buildings shall be set well back from the traffic currents, and the many instances we find of the violation of this rule result in great disturbance to the traffic. The Place de l'Opéra and Place de la Madeleine, Paris, and the Gensdarmen Market, Berlin, are good examples of ornamental places, though varying considerably in their character. The first is planned upon a lozenge-shaped site overlooking the Place de l'Opéra and terminating a superb vista from the Place du Théâtre Français along the Avenue de l'Opéra, among the finest vistas in Europe. The entire scheme is perhaps the greatest result of Haussmann's remodelling, and architecturally one of the finest examples of town-planning in Europe, though from a traffic point of view it leaves much to be desired.

Fine as Continental cities may be, we Londoners can proudly boast that London stands unrivalled amongst the European cities—I think I might say amongst the cities of the world—in possessing the largest number of public open spaces; both in proportion to her acreage and also to the number of her citizens. It is a curious fact that whereas London has enormously increased her open spaces, Paris during the last century has allowed them to decrease from 960 acres in 1789 to 330 acres in 1900. Having this splendid series of public open spaces, may we not justly reproach ourselves as architects with the poor use that has been made of them? Such a superb site as that offered by Trafalgar Square, with its broad gentle slopes, would have been treated in a far grander way in either Paris, Berlin, or Vienna. How such a site, the centre of the Metropolis, would have appealed to Haussmann! Let us hope that with a better educated public opinion we are on the eve of better times; and it behoves members of this Institute in London to see that when the day comes that the squares of London fall into the hands of the public, the borough councils will realise that it is not sufficient merely to open the gates, or remove the railings, but that whether these squares be replanned as traffic-distributing centres, as forecourts to great public buildings, as gardens, or for purely ornamental purposes, they are the most powerful factors that remain to us for the beautification of our great Metropolis.

Messrs. E. H. Shorland and Brother, of the Manchester Stove Works, Failsworth, Manchester, announce that they have been compelled to remove to much larger works, owing to the increasing demand for their warm-air patent Manchester stoves, grates, and ventilators.

* * *

Hogarth's House at Chiswick has been presented to the public by Col. Shipway, of Grove House, Chiswick. The title deeds have been lodged with the Middlesex County Council. The donor, who is a great admirer of the famous artist's work, has furnished the house with many originals of the great satirist and copies of the original furniture.


MIXED SECONDARY SCHOOL : BURY :
PERSPECTIVE : VIEW FROM
STREET :
: SECOND PREMIATED DESIGN :
CASTLE & WARREN Architects
HALL

This design was the second premium in the recent competition for which 141 competitors submitted designs. The assessor Mr. J. W. Simpson, F.P.R.I.B.A., refers to this design in his report as follows. "The second premium I award to No. 97, whose author submits a thoroughly well-planned design: the various departments are disposed in a way which shows a thorough knowledge of the subject, and the elevations are artistically designed."

THE ARCHITECTURE OF THE INCAS OF PERU.*

A study of the architecture of the Incas of Peru takes us back into the interesting—almost fascinating—past of what we now call the "New" World. Upon the plateaux and slopes of the great snow-crowned Cordillera of the Andes, fronting upon the Pacific Ocean, we encounter a series of ancient buildings and stone structures so remarkable as to compare with those of the Nile; to which, indeed, they have a certain analogy.

The author showed that the climate and topography of Peru bears in an important way upon the architecture of the Incas and pre-Incas who flourished there in past ages. The mural remains of these people, their great monuments in stone and sun-dried brick are found all over the region of the Cordillera, and to a lesser extent upon the coast; and the character of these remains varies much in accordance with their situation and climatic environment. Thus, upon the rainless coast-zone the buildings were largely of adobe, or sun-dried earthen bricks—the material used throughout Spanish-America to-day, whether in Mexico, Peru, or Chile; whilst as we rise to the rainy region of the mountains we observe that they are of stone, shapen or unshapen. The adobe lasts for centuries on the dry coast plains; it would have perished long ago upon the rainy plateaux and become obliterated; and here it is that the beautiful examples of the stone-shaping art of these pre-Hispanic people is found in its perfection. The whole region over which these monuments are found may be taken as more than 1,500 miles long by 300 miles wide, extending throughout what is now Ecuador, Peru, Bolivia, and part of Chile—an enormous range of territory for a semi-civilised people to influence, and greater than that which included the civilisation of the Euphrates and the Nile together.

The Inca Empire, it will be recollected, flourished, as far as can be ascertained, from the time of the first Inca, Manco Capac, who founded the dynasty at the beginning of the XIth century of our era, to the time of the arrival of Pizarro and the overthrow of Atahualpa, in 1532. But the Incas were not the first civilised people of Peru. They were preceded by, and probably inherited their civilisation from, the Aymaras, whom they probably overthrew. The various mural remains throughout the country are, therefore, of different people and periods—some only nine to five hundred years old, others being of much more remote epochs, measured possibly by thousands of years.

The Empire of the Incas, at the time of the conquest of Peru in 1532, had as its main centre Cuzco—the word itself signifies "the navel"—in modern Peru, and Quito, the capital of Ecuador, upon the equator; and these centres were connected by the famous Inca roads, which some historians—generally those who have not seen them—have described as equal to the roads of the Romans, which statement is far from being true. They were, however, means of communication of the utmost value to the Empire, and although they were nothing more than trails for the llamas, those wonderful camels of the Andes which were the only beasts of burden known to the people, who consequently possessed neither horses nor wheeled vehicles, they gave access from place to place, and were traversed by the remarkable system of posts and postmen maintained by the Inca Government. These roads, from Cuzco to Quito, were more than 1,100 miles long—a distance greater than that from the Euphrates to the Nile. Moreover, as engineering structures even, these roads were of considerable merit, crossing by rock-hewn steps the summits of the Andes above the perpetual snow-line, passing swampy lands by stone causeways, and rivers by means of the remarkable suspension bridges made of woven grass or osiers, and by stone structures.

There were two main roads. They both traversed the country longitudinally along the line of least resistance paralleling the ranges of the Andes. One, the most remarkable, ran along the high plateaux and summits of the Andes; the other followed the lowlands of the coast. The groups of buildings are in some cases disposed along the line of these roads, or are adjacent thereto, portions of the roads only remaining here and there. The structures consist mainly of castles and fortresses, temples, palaces, astronomical observatories, tombs, and groups of habitations or towns. All these are now abandoned and in ruins, with the exception of some which form part of recent Spanish-American structures at Cuzco. The Moorish type of building inherited from Spain looks exceedingly incongruous and evanescent in comparison with the solid massive Inca masonry beneath it, in the few instances where the two are encountered together.

The ruins of most notable occurrence are situated in the neighbourhood of Cuzco, and upon the region bordering upon the great Lake Titicaca. This lake, it will be recollected, is of its kind the most remarkable in the world, being 12,350ft. above sea-level, and so large that one may navigate upon it out of sight of land. It is remarkable also in being, in company with some other lakes, a hydrographic entity, which has no outlet or means of exhaustion for its waters, except that of evaporation, as far as is known.

Cuzco is about 200 miles from the lake, and was the great Mecca of the people and the seat of government. Overlooking the city— which to-day is an important, populous place, standing 11,000ft. above sea-level—is what is perhaps the most remarkable pre-historic building in the New World, and indeed in some respects in the whole world. This is the fortress of Sacsaihuaman. It consists of a series of four or more great walls, from 12ft. to 25ft. high, forming terraces up the hillside 1,800ft. long. The walls are built as great revetments, with twenty salients at regular intervals, the masonry being formed of Cyclopean worked stones,

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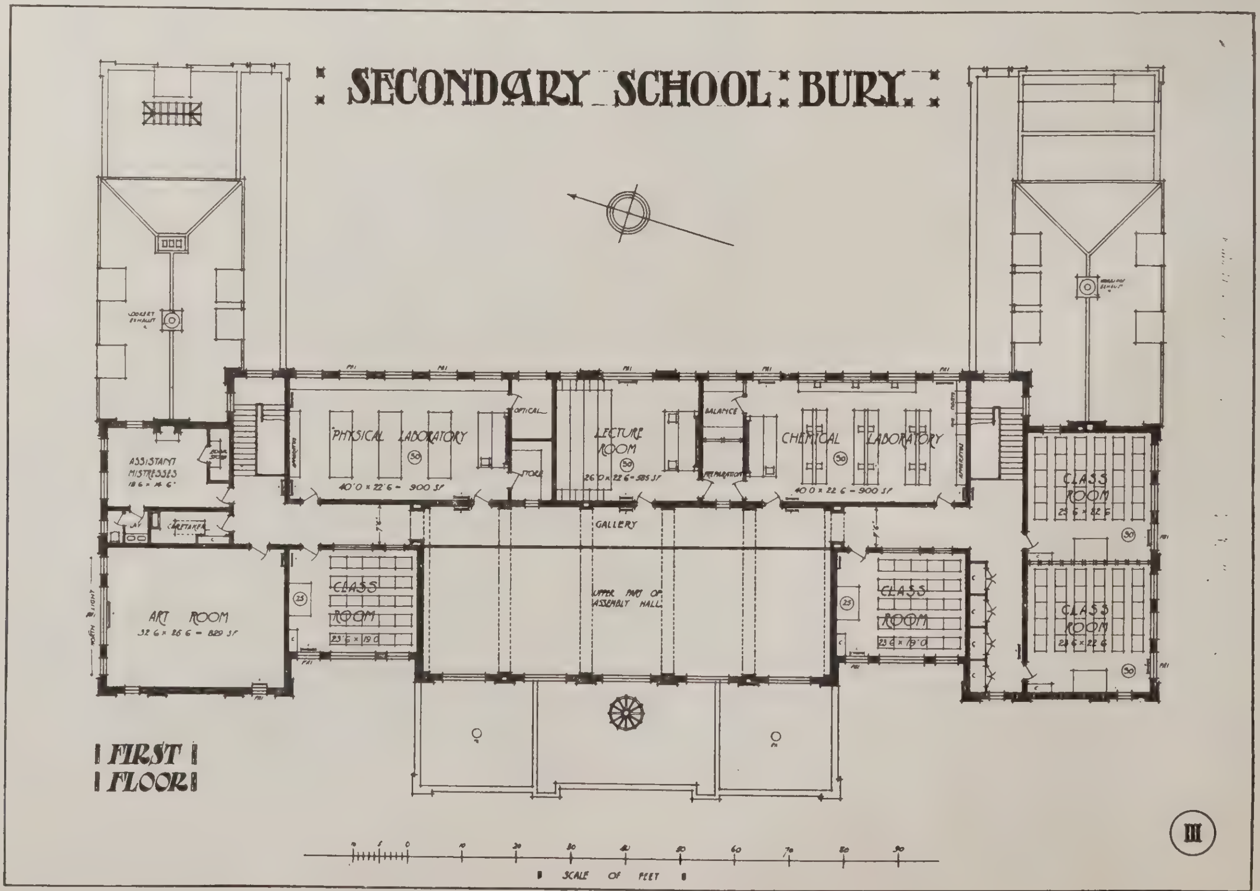
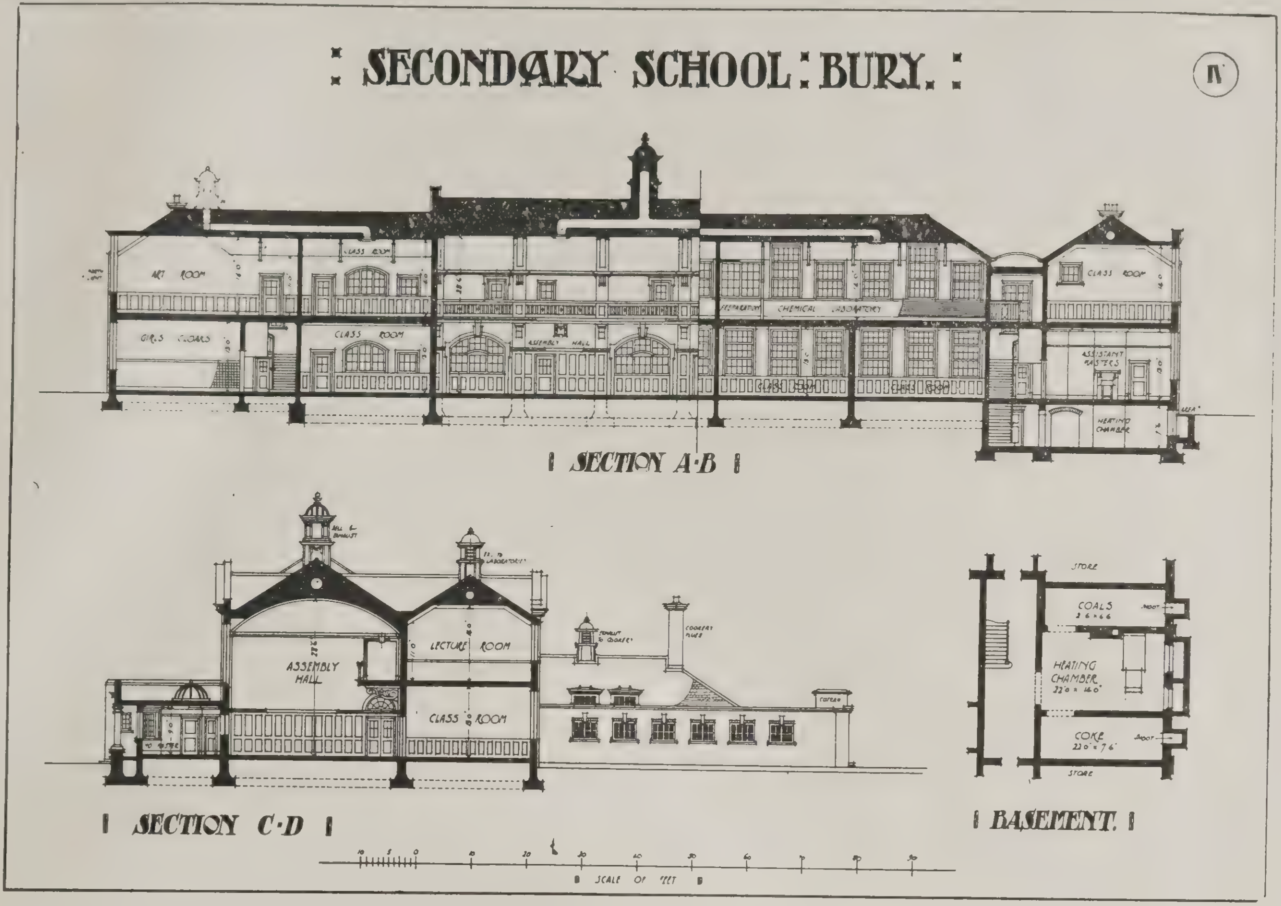
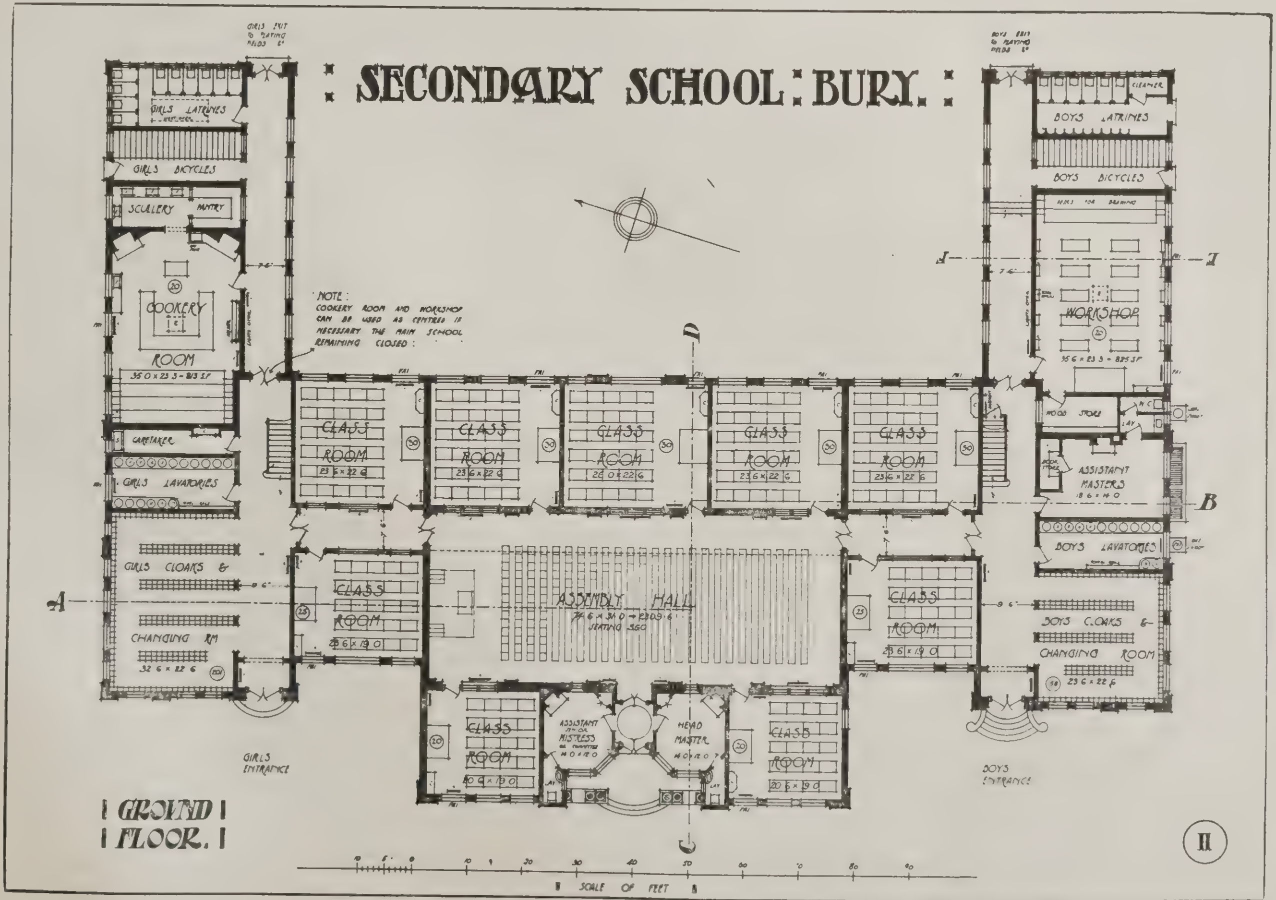
* Abstract of a paper read by Mr. C. Reginald Enock, F.R.G.S., on November 19th, before the Architectural Association.



DESIGN BY CASTLE AND WARREN, ARCHITECTS.





DESIGN BY CASTLE AND WARREN, ARCHITECTS.

which in some cases are nearly 20ft. high, weighing many tons. Indeed, we are at once struck on observing the walls of this fortress, as well as those of others of the Inca buildings, with the remarkable character of the masonry, not so much by the size of the monoliths as by what is either a singular disregard of uniformity and alignment in the joints, or is a curious, purposeful variation of these. Thus we see that each stone is an individual, not a counterpart; a polygon, not a cube. In many cases the stones are cut out to fit each other in a way such as must have involved much labour, especially when it recollected that the Inca masons probably had no means of laying out angles; so that presumably the stones were made to fit each other by the laborious method of constantly removing and replacing. It has occurred to me, although I may be wrong, that this giving of an individuality of form to each stone was a nice and purposeful art, or carried out for some now unknown reason. Notwithstanding this diversity of surface, the contact between the stones is generally so perfect that a knife-blade cannot be inserted; and there is no mortar. In some of the temples—it is stated by the Inca historian, Garcilaso—gold and silver was used as a bedding material for the stones. Whatever may have been the reason for this lack of uniformity in the Inca masonry, it is singularly beautiful, and the walls have well resisted the ravages of time and the elements. In the streets of Cuzco some well-preserved examples of Inca walls form part of modern buildings, as before mentioned. A good example is the wall which was the base of the Palace of Huayna Capac, one of the later Inca emperors. Here massive stones are encountered, polygonal in form, fitting perfectly into each other. One of these is a twelve-sided polygon. This wall forms part of an Inca street which is used to-day. In the city of Cuzco there are various other buildings, notably the remains of what was the Temple of the Sun. Overlooking the valley we have also the singular steps or terraces, cut out of the living rock, which is termed "the seat of the Inca," and it is stated that the Inca Emperor took his seat here to watch the construction of the great fortress.

At about a day's ride from Cuzco we reach the head of the Yucay Valley and see its base 4,000ft. below. Upon the slope of this remarkable valley—it is one of those which drain into the affluents of the Amazon—the ruins of another remarkable fortress are encountered—that of Ollantaytambo. This also consists of great terraces of Cyclopean masonry. We also observe in this structure a common feature of Inca architecture—the series of niches in the walls, with their characteristic trapezoidal form, giving a unique and handsome effect. No style of building could accord so well with its environment as these massive structures of the Incas. Possibly the builders were influenced by the mighty mountains which overhang their valleys, and strove to adapt their work to the stupendous Andine architecture on every hand, fashioned by the "Unknown God," to whom their temples were raised.

Another remarkable group of ruins in the same region is that of Intihuatana and Pisac. The latter is another imposing fortress upon the summit of the mountains, a remarkable situation with an extensive view of the surrounding canons. But this fortress of Pisac had its own sacred purpose. It enclosed—and still encloses, the temple wherein stands the famous astronomical stone or pillar of Intihuatana. This word means in the Quechua tongue, "the seat or throne of the sun," or the place "where the sun's rays are collected." The pillar was, in fact, the instrument by which the Inca astronomer-priests determined the solstices. The column, now broken but still existing, is worked out of the solid rock. It is enclosed by a circular tower, and in this the priests observed the shadow of the column upon an east and west line inscribed upon a circle which surrounded it. When the day approached, great feasts were celebrated, and a golden stool was placed upon the shaft so that "Inti," the sun, might "sit down" upon it, for solstice. There were others of these astronomical pillars throughout Peru and Ecuador, but they were generally destroyed by the Spanish priests after the conquest, as "things of the devil"! The fortress and buildings surrounding the column-chamber are beautifully executed—stone-built corridors, halls, and chambers; whilst the whole place, surrounded by beetling precipices and protected by revetments of granite masonry, are impregnable. In the rock walls of the valley are seen ancient tombs in absolutely inaccessible positions to-day. These great fortresses commanded the valleys leading down to the region of the Amazonian forests below, and were to protect the empire from the incursions of the savage tribes dwelling there. Even to-day the forest region beyond the Andes is a savage, unexplored territory in great part, inhabited by bands of Indians, although the business of rubber gathering is opening it up to some extent.

Leaving the regions of Cuzco for that of Tiahuanaco, near the southern end of Lake Titicaca, about 300 miles away on the border of Bolivia, we find ruins which in a sense are more remarkable than those of Cuzco, because far more antique. The temples and fortresses of Cuzco date only from the beginning of the XIth century, as stated, of the Christian era, when the Inca dynasty came to being; those of Tiahuanaco and others are of unknown age, and doubtless were built by the Aymaras at the time of their greatest culture before their overthrow. Some writers, indeed, have maintained that they were contemporaneous with Babylon or Assyria. But be that as it may, they are of a different type from that which the Inca stone-shaping art produced, and they form the ruins of the oldest city in the New World, here upon this high, bleak, sterile plateau of Titicaca, more than two miles vertically above the level of the sea.

The ruins of Tiahuanaco consist mainly of the outline of a great temple, shown by rows of upright monoliths, foundations, parts of stairways, a great stone doorway, and some collossal stone figures. It has been a question how these great monoliths were transported here, but if we take into account the hydrographic conditions of the site, which might have been formerly an island when Lake Titicaca was more extensive than even now, it is conceivable that they were floated to the spot, and possibly their quarries were nearer at hand than has been supposed. Indeed, quarry sites have been established in the neighbouring hills. But, on the other hand, some of these monoliths, both here and at Cuzco, have been transported for great distances over the most broken country imaginable, and their carriage presents the same question as has been aroused concerning the monoliths of Egypt. Near Cuzco is an enormous stone which had been abandoned on the road, and an Indian tradition says that the stone "wept tears of blood" at being left there. These great stones of Tiahuanaco, unlike the Inca walls, are often very richly carved. The most remarkable of them is the monolithic doorway of Akapana, with its carved figures, the central one of which has been taken by Peruvian archæologists to represent the mystic diety Huirakocha. Some of the lesser figures have human bodies, hands and feet; some human heads, others heads of condors; some wear crowns and carry sceptres, and they appear to be in an attitude of adoration of the central figure, which itself holds sceptres, carved with the heads of tigers and condors, which were probably symbolical of strength and power. This central figure of Huirakocha (or Viracocha) was the supreme god of the Andine people, typical of the "Abyss of the Waters," as was "Ea" among the Chaldeans. Among other notable monoliths of this group of pre-Inca ruins is a great stone image, about twice the height of a man, which stands upon the plain.

Upon the islands of Lake Titicaca there are other remarkable ruins, both Inca and pre-Inca. From this island it was that Manco Capac, the first Inca, whose virgin birth as a redeemer of man is part of the Inca mythology, set out to civilise the savage tribes of the Andes. There are many ruins on this island, as also upon that of Coati; ruined temples to the sun and the moon, the former of which the Inca worshipped as symbolical of a greater Deity. There was, indeed, much that was chaste and ethereal in the Inca religion. They imagined a Supreme Being, an "Unknown God," who pervaded everything but who could have no visible or tangible form or likeness; and they did not set up idols, nor were human sacrifices performed. The image of the Creator was represented at Cuzco by an elliptical plate of gold set on the wall of the temple. In the Titicaca region there is also a remarkable ruin, known as the "Temple of Huirakocha"—huge walls which probably were never completed; work of the Aymaras.

If now we leave this part of Peru and Bolivia and journey to the north some 700 miles—or about 400 from Cuzco—we reach the region of the Upper Maranon River, where we encounter several other beautiful examples of the Inca and pre-Inca stone-shaping art. Indeed, we shall have passed other vestiges of their time upon the way, such as the monoliths of Huaitara, and ruins of prehistoric villages in many places. The modern capital of this region is the town of Huaraz, a typical Andine city, 10,000ft. above sea level, and overhung by the snowy Cordillera to the east. There are many vestiges of the Inca period here, but we shall cross the main range of the Cordillera; and one of the passes which I have traversed on various occasions is an old Inca pass of rock-hewn steps at an elevation of nearly 15,000ft. We then descend to an affluent of the Maranon, upon which is situated the remarkable Castle of Chavin. This castle, which the author explored, is largely in ruins, but there are numerous singular underground chambers and passages, the purpose of whose construction it is difficult to understand. The walls are of blocks of hewn stone. But the main point of interest here is the singular carved monoliths, doubtless of pre-Inca origin, which exist or existed here. One of these, a beautifully carved stone about twice the height of a man, was transported over the Andes and down to Lima, on the coast, where it stands in the Exhibition Park. Another in the form of a column yet remains in place.

The whole of this remote region of the Upper Maranon is dotted with the ruined dwellings of the former occupiers of the land. Houses, streets, fortresses, sometimes in the most inaccessible positions, upon appalling crags, towards which the night-mists from the Maranon roll up in fleecy folds like a mysterious pall, and from them these ruined castles and wall start suddenly as we behold them, like the ghosts of the dwellings of a vanished race—which, indeed, they are—weird and unique. The disposal of these numerous ruins, often about a central fortress commanding the heads of valleys, and surrounded by the abandoned "andenes" or terraced fields of these people, goes to show that the inhabitants lived as clans, or "Gentiles," and their ruined dwellings are termed by the Indians of the Andes to-day "casas de los Gentiles," or "houses of the Gentiles." These "andenes," or cultivated terraces, are a most striking feature of the Andes. It has been calculated that the population of the Inca Empire might have reached 90,000,000 souls, but the author considers this greatly over-estimated. It is not difficult, however, to conceive a people as numerous as that of Great Britain to-day.

The most remarkable group of ruins in this region is that of Huanuco Viejo. It stands upon a broad, flat plain upon an arm of the Maranon, at an elevation of about 12,000ft. above sea level, and consists of an extensive palace, a fortress or temple of the sun, baths, and an extensive village of streets, with a singular series of round and square dwellings, alternating, in long rows. The chief architectural feature of the buildings is a series of stone doorways, really beautiful examples of Inca masonry, and the castle or temple. In the palace there are six of these doorways, all standing in a line at considerable distances apart, so that the observer who takes his stand in front of one of them is enabled to see through the whole series. The line so taken through them is about east and west. The total length across the courtyards or halls to which these doorways give access is about 400ft. The doorways are of typical Inca tapering or trapezoidal form, with quoins and lintels of beautifully fitted stones of the more or less polygonal form previously described, and so closely fitted that a knife-blade cannot be inserted in the joints. No mortar has been used. The lintels are monoliths of nearly 7ft. in length in some cases, and the thickness is about 3ft., which is that of the walls of which they form part. The characteristic niches, also of trapezoidal form, are a marked feature of the walls of these ruins.

The castle, which stands in the centre of what was a huge square, around which the palace or palaces are disposed, is a building of different character. It is rectangular in form, about 100ft. wide and 170ft. long, very solidly constructed of cut stone blocks surmounted by a cornice, whose moulding is composed of a fillet and cavetto, as in the Doric order. The whole plain in the vicinity is covered with the ruins of small habitations, generally of unhewn stone. All the masonry of these ruins is composed of blocks of silicious limestone, which have been extracted from a stratified hill at edge of the plain.

The ruins of Huanuco Viejo are of much interest, and, as far as the author is aware, they had never been previously examined and depicted. These great stone structures of the high plateaux are in a region at a vast elevation above sea-level, where there is little vegetation, absolutely no timber, and where corn or other cereals will not grow.

Leaving the high region of the Sierra and descend to the coast, the principal ruins of the Incas, pre-Incas, and other semi-civilised former occupants of the land, such as the Chimus, are found to be mainly of buildings constructed of adobe.

The most famous of these ruins formerly was that of Pachacamac, which at the time of the Conquest was a splendid temple raised to the "Unknown God." To-day, nothing remains of this great temple but a mound of rubbish, a day's ride from Lima. Proceeding along the coast-zone to the south we shall reach a group of ruins known as "Incahuasi," or "the house of the Inca." These, unlike the coast ruins generally, are of stone, although they lack the beautiful workmanship of the mural remains we have visited in the Andes. But they are unique in one respect—they contain a row of columns. This is an architectural feature absolutely unknown in the Inca and pre-Inca ruins elsewhere, for, except in this case, the column was unknown to the Andine people, as was the arch. The columns of Incahuasi are not monoliths, however. The building probably dates from the XVth century. Still further to the south, slightly inland from the port of Pisco, we encounter an extensive group of adobe ruins in a good state of preservation, consistng of long walls with characteristic trapezoidal-formed doors and niches, and corridors, halls, and rough stone foundations. The niches are still coloured with some red pigment, possibly vermilion from the great quicksilver mines in the Andes to the east, for vermilion was obtained from the cinnabar to paint the faces of Inca beauties.

Still further south in this coast-zone of Peru were encountered remains of long aqueducts, a line traceable for 80 miles along the hill-slopes, for the Incas were expert in hydraulics and irrigation works. There are other long ruined aqueducts in other parts of the country also.

Far to the north, we come to the region where the Chimu people flourished, who were overthrown by the Incas. They were a powerful semi-civilised coast people, and numerous ruins attest their skill in mural construction. Among these the most notable are the ruins of Chan-Chan, whose walls show florid decorations, elaborated in cement. These ruins are not far from the modern city of Trujillo, and would repay careful study.

The Inca and pre-Inca architecture differ much. They first lack any iconographic carvings, such as we have seen at Tiahuanaco and Chavin. Monoliths of considerable size were common to both; one of those at Cuzco is 27ft. long, 15ft. wide, and 12ft. long, and there are others of almost equal size. The stones vary as to their geological composition according to the region; some are of granite, as at Cuzco, some of trachyte, sandstone, or basalt, whilst others are of a hard, silicious limestone. It is to be recollected that this remarkable stone-shaping art was performed without the use of iron; but the Incas possessed bronze, termed *chumpe*, and copper tools. Indeed, they were skilled metallurgists in copper, gold, and silver. As previously stated, the Incas were unacquainted with the arch, but nevertheless they constructed dome or "beehive" roofs, both to their tombs, at times, and to their conical houses, whether of stone or adobe. They also employed the principle of corbelling-out over openings, and to form the abutment of small bridges. In general terms the principal characteristic of the Inca architecture is its great solidity. It would seem that the builders had desired to bequeath to posterity these chapters in stone of their history; and, indeed, it is safe to say that these may be expected to outlast any of the modern structures of America, whether the architectural work of Colonial Spain—good and solid as this is generally—or whether the evanescent skyscrapers of the Anglo-Saxon on the Northern Continent. Solid as these walls are, however, the roofs of the large buildings have perished long ago; as their builders do not appear to have been able to advance beyond sloping roofs of poles covered with grass thatch; or, at any rate, in the absence of anything else we can only assume this to have have been the case. Their buildings, with small exception, are never of more than one story. Nor were they acquainted with the use of burnt brick, although their ceramic art was an advanced one, as we know from the beautiful and abundant Inca pottery. In the shape of their vases (as well as in the form of some of their buildings) they showed a curious knowledge of acoustics. There were no doors to the houses, the openings being covered with a mat. The interiors of the temples were covered with plates of gold, of which the Spaniards secured great booty.

A few words as to the origin of the Incas and pre-Incas. Their generally assigned origin is from Asia, and the Mongol cast of face is very noticeable among the pure indigenes, both of Peru and Mexico. As to their arts, an origin has been assigned in Egypt and in Mesopotamia We have seen the tendency to the pyramidal in the Inca structures, giving some atmosphere of the buildings of the Nile. A host of other analogies have been adduced. The use of copper tools, the custom of embalming the dead, for mummies are common objects in the Inca tombs; the Indian canoes of Lake Titicaca, with their turned-up prows and mat sails, which are the counterpart of such a craft figured on the tomb of Rameses II.; religious customs, including sun-worship and moon-worship; matters of design upon pottery and woven textures; the wearing of sandals; and, above all, their stone-shaping art and their transport of monoliths. The theory of Asiatic or Egyptian origin has been strenuously denied and strenuously supported, and the approaching shores of Behring Straits, where America touches the fringe of Asia, have been pointed to as the probable path which these prehistoric immigrants followed, when, bearing in their bosom the germs of a civilisation and a religion from the ancient world, they passed down these 10,000 miles of Pacific littoral and inclement Cordillera of America.

Discussion.

Mr. R. Phené Spiers proposed a vote of thanks, and remarked upon the excellent drawings that Mr. Enock had prepared. It seemed that there had been two races in Peru before the advent of the Spaniards—the Incas and another race, of which no definite evidence of habitation remained. It had been conjectured that this race had had some relation with the Babylonians or the Egyptians, but he, personally, put no faith in the theory. Referring to the peculiar trapezoidal form of some of the doorways and arches, Mr. Spiers advanced the view that the latter work of this kind, in stone, was copied and made a purely decorative feature from the old sun-dried brick constructions. The raking sides, he believed, were not of Egyptian origin. He would like to know how the Incas covered in their buildings. It was true that the modern roofs were formed of poles covered with thatch, but he believed a race that could erect such massive walls would require, and would certainly evolve, a far more durable covering than that. The roofs must have been either flat or doomed. The reason of the complex irregularity of the huge stones which formed the walls was to be found in the obvious fact that the builders of that time chose the materials immediately to hand. They built in horizontal form later, because they had found a suitable stratified stone. Mr. Spiers then made reference to a colossal wall that Mr. Enock had stated to be the remains of a temple. He (Mr. Spiers) was, judging from its appearance, more inclined to think it originally filled that office of an aqueduct. The openings of peculiar formation were extremely interesting; and he thought that they must have had the arched form. The wall was perfectly magnificent, and must have involved an immense amount of labour in its erection. M. Choisy had shown in his book how the ponderous materials were transported. He had great pleasure in proposing the vote of thanks.

Mr. F. Dare Clapham seconded the vote of thanks, and observed that as Mr. Spiers had dealt so ably with the architectural aspect of the paper, there was little left for him to say. Judging from Mr. Enock's description of the climate, it was small wonder that a sun-worshipping people went to a land like Peru. The Incas were not the first inhabitants; but was it not curious that the indigenes should bear a distinct resemblance to Asiatic types? He wondered whether there were any mummified remains to give evidence of the early inhabitants. The rugged architecture seemed quite in accordance with the tremendous mountains surrounding it. The ancient roads and bridges must have been wonderful engineering works. From what he had heard, it would appear that that early civilisation was one of little freedom, but of much order and well-being. Everything was done under strict supervision; quantities of water were dealt out for agricultural and other purposes, and he understood that doors had always to be kept open in order to ensure the absence of too much luxury. He heartily seconded the vote of thanks.

Mr. Leonard Elkington and Mr. H. W. Brittan having supported the vote of thanks, Mr. Tanner commented upon the interesting discussion that they had had, and remarked that the Incas, in their selection of territory, had chosen a singularly inhospitable position. There could not have been enough to sustain life. The architecture was purely rudimentary; and, referring to the point that Mr. Spiers had raised, he thought some kind of centering must have been employed in the construction of the openings in that huge wall.

Mr. Enock, in reply, observed that it was impossible to go into the subject of the origin of the Incas. No solution of the mystery had been found, although there were indications of Asiatic origin. With respect to the roofs, it should be borne in mind that the coast zone was a rainless region. On the plateaux of the Andes, however, there was an excessively heavy rainfall, and snow. He believed that some of the roofs in this latter region were flat, with earth to keep the water out. In one of the buildings he had observed the appearance of a double gable end. Mr. Spiers said that the trapezoidal form was evolved from the sun-dried brick. This could not have been, because that particular form was found only in cut stone. There were plenty of mummies, but they were all of comparatively recent date. They were buried in rough stone cells, and could be found in all parts of Peru. Some of the woven bridges still exist, some of which were 200ft. long, which was a great length for a primitive suspension bridge. It was certainly remarkable that such a well-ordered civilisation of undoubted socialistic character should collapse before a mere handful of marauding Spaniards. The social system gave no rise to initiative or progress; and when an attack was made they could not stand against it. He thanked them heartily for their very kind reception.

The following gentlemen were elected members.—Mr. W. B. Steadman, Mr. R. G. Hopcraft, and Mr. W. Paramor.

The Marylebone Borough Council has decided to pave Cavendish Square with wood at a cost of £4,865. It was decided to apply to the London County Council for a loan of £24,000 to extend the electric light along 21 streets of the borough. Mr. Debenham, chairman of the Electric Supply Committee, said that this would provide work for no fewer than 400 unemployed men in Marylebone for a period of 16 weeks at a wage of 25s. a week.

* * *

Sir William Richmond, R.A., presiding over the annual meeting of subscribers to the British School of Rome, on the 16th inst., said that archæology had caused Egypt to live again in the 20th century. Layard, Wilkinson, and Newton and others had, in a sense, remodelled history, and, with often too little help from the Government, had enabled the world to understand the building up of ancient civilisation. Archæology had been very serviceable to artistes, whose spontaneity and technical artifices need not be hampered by being truthful; they should rather be assisted than otherwise by modern research. Italy was so full of variety that the whole ground had not been uncovered yet, either by the spade or by the scholar. It was a mine of treasures as yet unworked, and wherever he had gone he had found a local archæologist, struggling sometimes to bring out a book, learned in his way, and ready to give up his time to an eager stranger. Scattered about in various churches there were very fine pictures and frescoes, while in the Museo Nationale at Rome there were fragments of wall paintings of great beauty of design, as well as of execution and colour, inscribed with Greek names. They seemed to him to possess qualities of colour in advance of any wall paintings as yet discovered, except perhaps the latest found wall paintings at Pompeii. Much of this beauty, its transparency, quality and beauty of colour, especially on walls where large areas of pigment were necessary, being the result of a perfect technique, caused one to long to know what were the methods of those ancient Masters, who in so simple a matter, as it would seem, as making a big space of one tone of colour vital, interesting, and precious, beat the moderns out of the field. What were their pigments? He suspected that they were only the common earths found near Rome. But what technique was employed? A chemical analysis would indeed be interesting and instructive. If some student of the School at Rome could solve the questions relating to colours and their uses in Rome how grateful artists would be. The ninth report of the committee refers to the excavations, carried out by the Government, in Malta; and the completion of the catalogue of the Capitoline Museum.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION
Nov. 30.	HERNE BAY PAVILION ON PIER Herne Bay Urban District Council invite competitive drawings for a pavilion to be erected on the proposed extension of the pier at a total cost not exceeding £4,000, exclusive of architect's commission. Premiums of twenty-five guineas and ten guineas. Plan of the site and copy of the conditions may be obtained from J. Jubb, Clerk to the Council, Town Hall, Herne Bay. Deposit: on. guinea.
Nov. 30.	TECHNICAL AND SECONDARY SCHOOL, WORKINGTON. The Cumberland Education Committee invite architects to submit sketch plans with outline specification and estimate for a technical and secondary school in the Borough of Workington, Cumberland, for about 300 pupils of both sexes. Further particulars and conditions upon which plans will be received may be obtained from the undersigned on receipt of a stamped and addresse foolscap envelope and the payment of a deposit of one guinea. Deposi returned if all papers sent are returned within seven days. C. Courtenay Hodgson, Secretary, The Courts, Carlisle.
Dec. 1.	TRALEE. CARNEGIE LIBRARY AND TECHNICAL SCHOOL. Cost not to exceed £4,500. Premiums of £20 and £10 for design placed first and second by the assessor. Copies of instructions and conditions from the Town Clerk, Tralee.
Dec. 1.	PUBLIC PARK PLAN, BANGOR (COUNTY DOWN). The U.D. Council offer a premium of £30 for the best scheme for laying out a public park, twenty acres in extent. Premium to include all expenses of successful competitor, whose designs become the property of the Council. Schemes to J. Middleton, Town Clerk, Town Hall, Bangor, County Down.
Dec. 8.	PRINCE HENRY'S GRAMMAR SCHOOL, OTLEY. New buildings in Farnley Lane, Otley. If the number of applications to compete is excessive it is intended by selection to invite 20 or 25 architects only to compete. A fully-qualified non-competing architect, in conjunction with the West Riding Education Committee's Inspector of Secondary Schools, will assist the Governors in adjudicating upon the plans. Applications, stating qualifications and experience, must be received by Ernest S. Mead, Clerk to the Governors, East View, Otley, before the date named.
Dec. 11.	MINEHEAD. SHELTER, with cloakroom and lavatories, on the Beach, the whole expense of which is not to exceed £3.000. Premium of £20. Plan of site and conditions from L. C. Webber-Incledon Clerk to U.D. Council, 16, Park Street, Minehead, Somerset.
Dec. 18.	TRAINING COLLEGE FOR TEACHERS, Kirkstall Grange, Far Headingly, Leeds. Architects practising in Leeds are invited to submit competitive designs for the above College. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed Assessor. Copies of the conditions of competition and instructions, a plan of each floor of the educational blocks and of the hostel blocks, also an estate plan, showing a suggestion for grouping the various buildings, may be obtained from James Graham, Secretary for Education, Education Department, Leeds. Designs to be delivered not later than 12 o'clock noon. Deposit: £2 2s.
Dec. 31.	SOUTHEND-ON-SEA. NEW COUNCIL SCHOOL. Limited to Architects practising in the Borough. Conditions of competition and plan of site on application to J. W. Barrow, Clerk to the Education Committee, Education Offices, Municipal Buildings, Southend-on-Sea.
1910. Jan. 1.	LARNE. TECHNICAL SCHOOL IN VICTORIA STREET. For the Larne Technical Instruction Committee. Total cost, including fixtures and enclosing of ground, not to exceed £3,600, Premium, £21, merged. Successful competitor will receive commission of 5 per cent. for supervision, including plans, specifications, estimates, and *Bills of Quantities*. Particulars of Thomas Cleqrkkin, Secretary, Technical In-Instruction Committee, Larne.
1910. Jan. 31.	NATIONAL MUSEUM OF WALES. The Council desires to receive competitive designs for the erection of a new National Museum at Cardiff. Three premiums are offered of £200, £150, and £100, for second, third, and fourth. The Council have appointed Sir Aston Webb, R.A., Mr. John J. Burnet A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A., as Assessors. Particulars and plans of the site will be supplied to competitors on payment of a fee of £2 2s., returnable if all papers are returned within 14 days. Inquiries to be addressed to Dr. Wm. Evans, Hoyle, Director of the Museums. City Hall, Cardiff.
Feb. 1.	OLDHAM, EXTENSION OF THE TOWN HALL. Restricted to Architects practising or residing in the Borough. Premiums of £50, £30 and £20, for the three designs placed 1st, 2nd and 3rd, and a sum of £5 will be paid to all unsuccessful competitors who send in a complete set of plans in accordance with the instructions. Plan of site, with instructions and suggestions for architects obtainable from E. C. Foote, Borough Surveyor, Town Hall, Oldham. Deposit: 21s.
Mar. 1.	GLAZED BRICKWORK DESIGNS AND ESSAYS. A committee of glazed brick manufacturers invite designs for works to be executed in glazed brickwork, also essays as to the advantages to be derived from the use of this material in accordance with conditions to be obtained from J. Johnston Green, 142, Liverpool Road South, Southport. Premiums of 100 guineas, 50 guineas and 25 guineas awarded to designs and essays jointly. Assessor Mr. Max Clarke, F.R.I.B.A., appointed by the President, R.I.B.A.

Workington Technical School Competition

A notice has been circulated by the Council of the R.I.B.A. requesting members not take part in the above competition.

Preston Grammar School.

Mr. F. W. Catterall, the assessor, selected six designs out of the 179 sets submitted, and the final choice was made as follows:—First premium, Messrs. Woolfall and Eccles, Liverpool; 2nd premium, Mr. Arthur Greenwood, Manchester; 3rd premium, Messrs. Packer, Drewitt and Drewitt, Southport. The building is estimated to cost about £12,000.

At King's College, London, on November 6th, master and operative plumbers attended for practical and theoretical examination for the purpose of registration under the National Registration of Plumbers. The practical examination consisted of tests in lead bossing, also bending and wiping large and small joints as required for good class domestic sanitary plumbing. In the theoretical examination questions were put to the candidates dealing with subjects of domestic sanitation generally, ventilation and the connection of water services to domestic dwellings and public institutions. Nine candidates succeeding in passing the examinations and were nominated to the General Council for registration under the National Registration of Plumbers, and admission to the register.

* * *

The following method of painting a cement wall was described at a recent convention of Canadian master painters. The building had become discoloured in places, and the joints were of a different colour from the surface of the blocks. Two parts of Portland cement, together with one part of marble dust, were mixed with water to the consistency of thin paint or a thick whitewash. The wall was well wetted before the application of this paint, and kept constantly wet while the material was applied, and then kept dry for a day in order to make the cement wash adhere to the cement surface. The wash was applied with ordinary whitewash or calcimine brushes, and a man was kept busy playing a spray on it while the work was being done. The whole secret of success lay in keeping the wall constantly wet.

Works in Progress and Completed.

ABERBEEG.—The Llanhilleth new Parish Church, which stands on an elevated site near the Rectory, was recently dedicated. It is designed in fifteenth century Gothic style of architecture, and is built of local stone, with Doulting stone dressings. The roofs are all of open timbered construction, and the seating and choir stalls of Austrian oak. The chancel, transepts, and towers are completed, but at present only about one-third of the nave and side aisles is finished. The church will accommodate about 300 worshippers at present, and 500 when completed, the cost being over £4,500. Mr. E. T. Bevan, of Penarth, is the builder, and Mr. E. A. Johnson, F.R.I.B.A., of Abergavenny and Merthyr, the architect.

BERWICK.—The new parochial buildings which it is proposed to erect in connection with the Berwick Parish Church, are to be built externally with local stone. The architects are Messrs. Harrison and Ash, who were placed first by the assessor, Mr. H. Beck, Doncaster, in the recent open competition. The buildings are estimated to cost about £2,000.

BRADFORD.—The foundation stone of a fine addition to the textile and engineering departments of the Bradford Technical College, which is to be erected in the Renaissance style, has been laid. The addition is estimated to cost about £18,000, while a further £14,000 will be involved in the provision of machinery and fittings. The design has been prepared by Mr. R. G. Kirkby, A.R.I.B.A., the City Architect.

BUDE, CORNWALL.—The foundation stone of the new Granville Hotel has just been laid. The site on which the hotel is to be built is a fine one, being situated on high ground, sheltered from all cold winds, and commanding an uninterrupted view of the St. George's Channel and the Cornish hills. The building has been designed by Messrs. Hatchard Smith and Son, F.R.I.B.A. of London, and is being erected by Messrs. Pethick Bros., under the superintendence of Mr. W. Hatchard Smith.

DUNNING.—The new reading room, which has just been opened, is the gift of Sir John Wilson, Bart. It is built of local stone in Gothic style, and forms an addition to the Town Hall. Mr. W. C. Laidlaw, of Edinburgh, is the architect.

EAST HAM.—The extension of the isolation hospital, which was opened recently, and which has cost £8,000, consists of two wards, each containing ten beds with the usual offices and nurses' quarters, etc., on the first floor. Large plate-glass windows divide each cubicle, so that the sister in charge can have a complete view of the patients throughout the whole ward. A doctor's residence, which has also been erected, is on the bungalow principle.

EDGWORTH.—The Edgworth Village Institute, which has just been opened, completes the memorial to the late Mr. and Mrs. Barlow, of Greenthorne. The building, which is in the Tudor style, is built of Accrington pressed bricks, with stone facings, and roofed with Staffordshire tiles. The main entrance is in the centre, and forms the lower storey of a clock tower. Mr. G. Faulkner Armitage, of Altrincham, is the architect, and the main building contract was carried out by Messrs. J. Hatch and Sons, of Lancaster.

EXETER.—The monument which has been erected in the Barnfield to commemorate the martyrdom of Thomas Benet, M.A., who was burnt at the stake at Liverydole in 1531, and of Agnes Prest, who suffered a similar fate on Southernhay in 1557, was recently unveiled. The work has been carried out in its entirety (under the professional direction of Mr. J. Archibald Lucas, F.S.I., A.R.I.B.A.) by Messrs. Harry Hems and Sons.

FORFAR.—The extension of Forfar Academy, which is now proceeding, will provide on the basement accommodation for the heating apparatus, etc. There will be a cookery and laundry classroom on the first floor. There will also be provided a gymnasium 52ft. by 30ft., with a lady instructress' room, boys' and girls' dressing-rooms, and music room. At the rear of the first floor will be situated a large workshop, with engine-room, a teachers' room, and a wood store. On the second floor there will be three large art classrooms, with a teachers' room, and also a capacious music room and dining hall. Messrs. Gavin and Soutar, Forfar, are the architects.

HARLINGTON.—The Baptist church has recently been remodelled, renovated and decorated, under the superintendence of Messrs. George Baines and Sons, 5, Clements Inn, Strand, London. The contract has been carried out by Mr. T. W. Crutchfield, of Harlington.

HEXHAM.—The new Queen Elizabeth Grammar School, which is now in course of erection, is a single-storey building enclosing a quadrangle. The assembly hall on the north side is 74ft. long by 29ft. broad, and has an open hammer-beam roof and oak panelled dado. Along the east and west sides of the quad. a wide corridor gives access to the classrooms, which accommodate 240 scholars. On the south side are the chemical and physical laboratories. The quadrangle itself will be laid out as a herb garden for the instruction of the students, and the architects suggest that a statue of Queen Elizabeth (the foundress) should be placed in the centre. The buildings are of stone, with red tile roofs. The school is being erected by Messrs. R. Blackett and Son, contractors, Darlington, from the designs and under the superintendence of Messrs. Oliver, Leeson and Wood, architects, Newcastle.

HUNSLET.—The new Council offices, which have just been opened, have been erected from the design of Mr. B. W. Higgins, of Oulton. The building is plainly but substantially built of stone and brick, and contains ample accommodation for the Council. The total cost, inclusive of site, is about £2,000.

ILFORD.—The new Hippodrome, which has been erected here, is a good example of modern theatre design. The elevation, which is treated plainly but tastefully in the Early English Renaissance style, is faced with red brick and white cement dressing and roughcast filling, flanked by two facades with gables with projecting cornices, and between these, over the entrance portion, which has a handsome verandah, an open loggia with columns supporting a tall roof covered with rich brown tiles. The fourteen exits from all parts of the house lead to Ilford Lane and the private road at the side. The auditorium, 74ft. by 74ft., is capable of accommodating an audience of 3,000. The stage, 60ft. wide by 33ft., is provided with up-to-date machinery, and has the usual flies and grid; the proscenium opening being 33ft. The entrance staircases and waiting-rooms are so designed that they will contain the entire audience, who may thus be under cover while waiting. The ground area on which the building stands covers 10,500 sq. ft. The circles, being supported on the cantilever principle, afford a clear uninterrupted

Photo: T. Lewis.

ENTRANCE ANNFIELD PLAIN PUBLIC LIBRARY. EDWARD CRATNEY, ARCHITECT.

view of the stage from all parts of the house. The whole of the building is lit by electricity by Messrs. Strode and Co. The decorations in white and gold, the draperies, carpets, and seating, are by Messrs. Dean, of Birmingham. The main building has been erected by Messrs. Coles, under the supervision of the Clerk of the Works, Mr. John F. Revill.

LIVERPOOL.—The construction of the Liverpool Cathedral is making but slow progress, the Lady Chapel being the more advanced section of the work. The whole of this structure has been covered in, and at present a staff of experts are busily engaged in putting the finishing touches on the carving work on either side of the chapel. As showing the stage at which the building of the Lady Chapel has arrived, it is interesting to note that the stained-glass windows are about to be inserted. In order that this may be accomplished safely and without undue delay, the chapel is to be closed to the public until the work is completed, four or five months hence. This step was decided upon at a meeting of the Cathedral Committee, when it was reported that further funds would be necessary in order to complete that portion of the work at present in hand, comprising the Lady Chapel, the ambulatory, the chapter house, the vestries and choir, and a portion of the great transept. Between £60,000 and £70,000 will have to be raised before these various sections can be prepared for purposes of Divine service. They will then give accommodation for about 2,000 worshippers.

LONDON, S.W.—The large building known as "Wellington House" Residential Hotel, which has just been opened at Buckingham Gate, S.W., occupies a superficial area of 12,272ft., having a frontage to Buckingham Gate of 174ft., and 143ft. to York Street. The building occupies an island site and is, therefore, unusually free from fire risks and noise from adjoining buildings. The accommodation consists of self-contained flats and single rooms, with public rooms for use of tenants, consisting of billiard-room, smoking-room and lounge, restaurant, dining, drawing and writing rooms, with banqueting and reception rooms ensuite; the scheme being to produce something between a high-class hotel and self-contained flats de luxe at one inclusive charge. The elevations are carried out in red bricks and gauged work in a style of free Renaissance, with rich modelling and decorations in Dennis terra cotta with dragged surface. The general contractor was Mr. C. Gray, of Kensington. The kitchen equipment was supplied and fixed by the Falkirk Iron Company, and passenger and service lifts by Messrs. Waygood and Co. The decorations, furniture and appointments were carried out by Messrs. Maple and Co., Ltd., from designs and under the immediate supervision of the architects, Messrs. Palgrave and Co., with Mr. Percival Hawkins, A.R.I.B.A., as chief-of-staff.

LONDON, W.—The Bishop of London recently dedicated the new chapel of All Souls, which has been erected on the south side of the church of St. Michael and All Angels, Bedford Park, W. Lord Halifax, who laid the foundation-stone in June last, has now given the silvered altar candlesticks, which are of Renaissance date. The architect of the chapel is Mr. Maurice B. Adams, who was churchwarden when Dr. Jackson, Bishop of London, consecrated the church in 1878, and still holds the same office.

LONDON, W.—The contract for the alterations to, and reconstruction of, No. 2, Seamore Place, Park Lane, W., under Mr. W. H. Romaine-Walker, architect, has been obtained by Messrs. Patman and Fotheringham, Ltd., 100 and 102, Theobald's Road, London, W.C.

MANCHESTER. — A new Wesleyan Church, which has been erected at a cost of £3,000, and which provides accommodation for 500 worshippers, has just been opened.

NEWCASTLE.—The new public hall has been erected in Northumberland Road, Newcastle, on the site of the old Yeomanry parade ground. The building is surmounted by a fibrous plaster dome tower, which is 80ft. in circumference. The building is of brick, and the principle hall, which will be used as a skating rink, about 250ft. in length, by 120ft. in breadth, and can easily be converted into a meeting place for concerts, political meetings, and other large gatherings. Seating accommodation for 6,000 people is provided, and a balcony will seat another 1,000. Messrs. J. Parkinson and Sons, of London, Blackpool, and Newcastle, are the builders, and Mr. J. H. Morton, F.R.I.B.A., of Newcastle and South Shields, is the architect. The front is by Messrs. S. De Jong and Co., London.

PETERBOROUGH. — The restoration scheme at St. John the Baptist's Parish Church, Peterborough, has involved a sum of more than £4,000. The chief work has been on the tower, which was in an extremely dangerous state, and the west end of the building, formerly obscured by unsightly brickwork, has been thrown open to the rest of the church. Some fine oak screens have been presented, to separate the vestry and baptistery from the main building. The church bells are being rehung, while several large windows, formerly bricked up, have been opened out, and filled with new tracery.

SOUTHAMPTON.—The East Street Baptist Church and Schools, which are shortly to be erected, have been designed in late Gothic style freely treated. Externally the facings are of red bricks with Bath stone dressings. The complete scheme embraces a church with a lofty tower, seniors' school, intermediates' school, and juniors' school. The last section is to be omitted for the present.. The cost of the portion to be executed is about £6,000. The architects whose designs were selected in a recent competition are Messrs. George Baines and Sons, 5, Clements Inn, Strand, London.

WATFORD.—The Leavesden Road Baptist Church and Institute, which were opened recently, are designed in a late period of Gothic, freely treated. Accommodation for 700 persons has been provided. Externally the building is faced with dressed red bricks with bath stone dressings, the internal joinery being of pitch-pine. The contract, which amounts to £4,150, has been carried out by Messrs. Chas. Brightman and Son, Watford. The architects whose designs were selected in a recent competition, are Messrs. Geo. Baines and Son, of 5, Clements Inn, Strand, W.C.

WORCESTER.—The new secondary school for girls, the foundation stone of which was recently laid, will, structurally, be a connecting link between the educational institutions which have their homes in the existing Institute buildings. It will occupy the space between the art and technical schools block in Sansome Walk and the library, museum, and art gallery block in Foregate Street, having its main entrance in Taylor's Lane. The school has been planned to harmonise with the existing buildings in material and design, the detail being carefully repeated, and will make the Institute a complete suite of buildings. The building, which provides accommodation for 200 girls, is being erected by Messrs. J. Wood and Sons, Ltd., from the designs of Mr. Alfred G. Parker, the city architect.

Invitations have been issued by Mr. Henry R. Aldridge on behalf of the National Housing and Town Planning Council, to a conference, to be held at Westminster Palace Hotel, on December 14 and 15, to consider suggestions as to the most practical lines of town-planning procedure adapted to urban districts, and to great centres of population. Papers are to be read by a number of well-known housing reformers, including Professor Adshead, of Liverpool University, Mr. B. Sebohm Rowntree, and Mr. Raymond Unwin.

Our Plate.

Annfield Plain Public Library.

This building, towards the erection of which Mr. Carnegie gave £3,000, was completed at the beginning of the year. It is built of local stone and roofed with Welsh slates, the floors of all main rooms are laid with wood blocks, and the interior fittings were executed in oak, from designs by the architect. There are spacious bookstores and workroom, heating chamber, etc., in the basement, connected to the ground floor by lift. The architect for the building was Mr. Edward Cratney, of Wallsend and Sunderland, whose design was selected in competition. The general contractors were Messrs. Southren and Johnson, of Dipton, Durham, the sub-contractors being as follows:—Heating, by Messrs. Emley and Sons, Newcastle; interior fittings, by Messrs. Robson and Sons, Newcastle; wrought-iron gates, by Messrs. Spittal and Clarke, Birmingham; lead rain-water heads and pipes, by Messrs. Henry Hope and Sons; and the lead lights by the Gateshead Stained Glass Company. The furnishings were not to the architect's selection.

Cottages, Walker Gate, Newcastle.

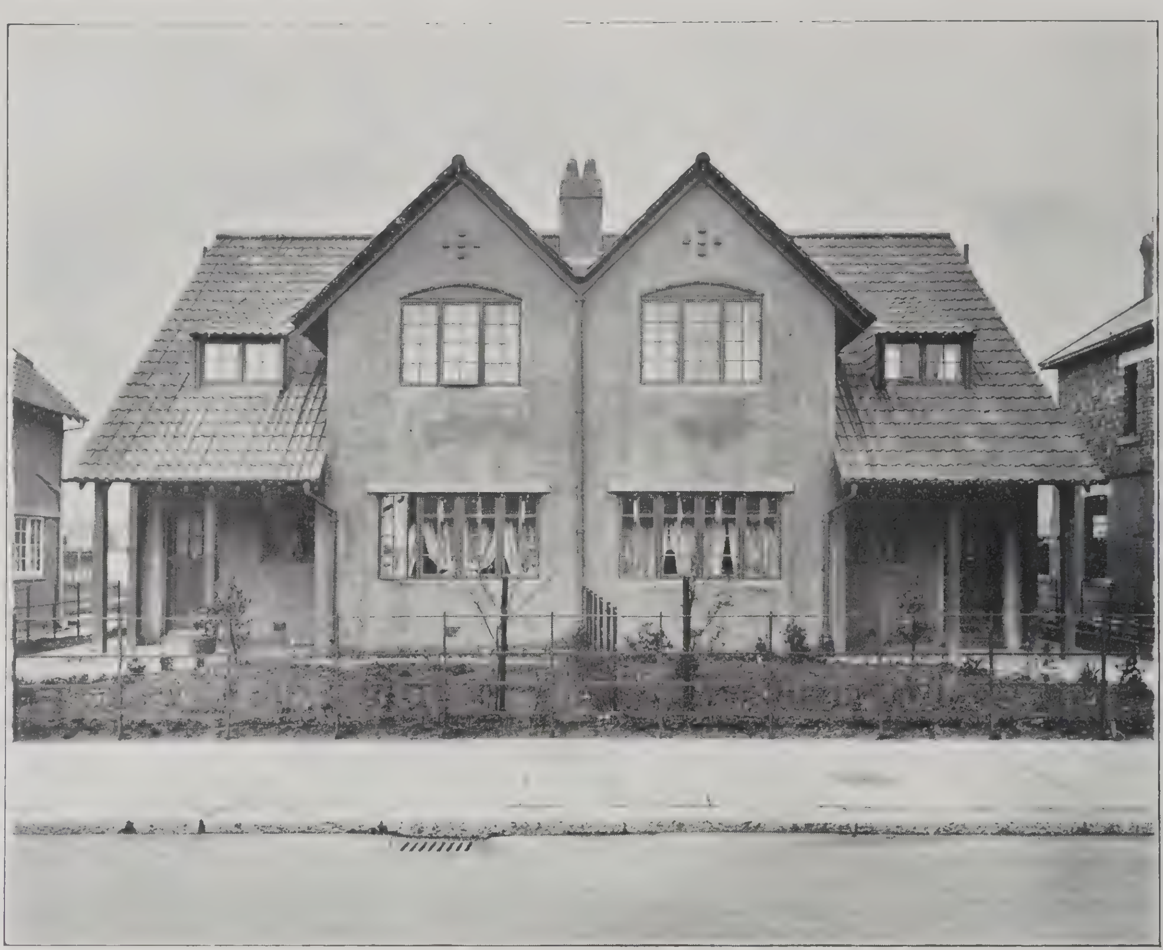
These cottages were erected on the Walker Estate, Newcastle, and were awarded gold and bronze medals at the recent North of England Model Cottage Exhibition. The cost per pair, including architect's commission (5 per cent.), was £520. The external walls were 11in. cavity, faced with first quality Wallsend "Atlas" bricks and two coats Portland cement rough-cast, dashed with white Derbyshire spar. The roofs are covered with Green's special "French" tiles. The architect was Mr. Ed. Cratney, of Wallsend and Sunderland. The contractor was Mr. James McHarg, of Wallsend.

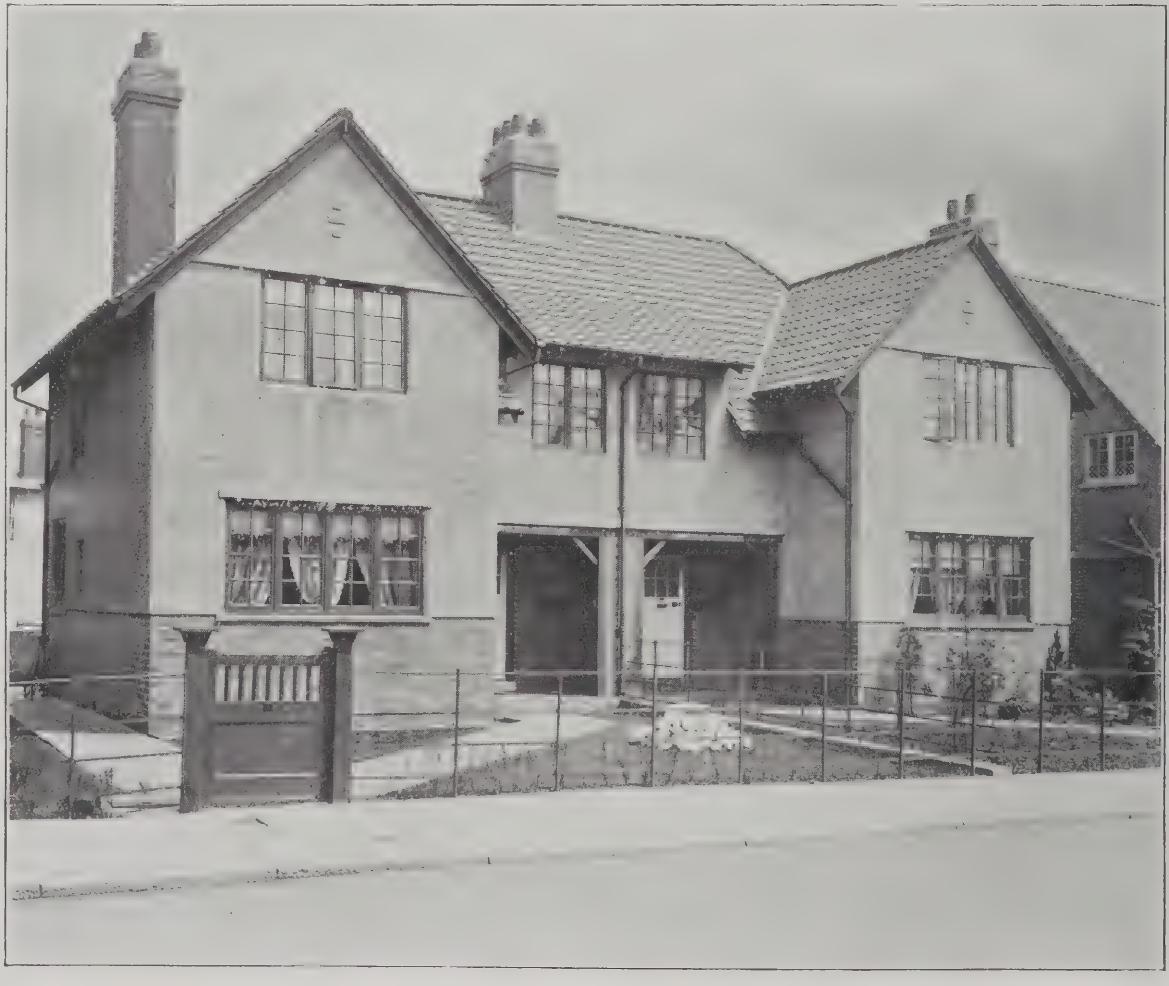
CISTERCIAN ARCHITECTURE.

Mr. John Bilson, F.S.A., the well-known architect of Hull, has written an exhaustive essay in the journal of the Royal Archæological Institute of Great Britain and Ireland, upon the subject of Cistercian Architecture. Although the Cistercian ideal was that of simplicity, and it was pursued significantly, this negative attitude, says Mr. Bilson, "was overmastered by the creative impulse of the twelfth century." In his essay he traces the growth of both, and their relation one upon the other, turning for his examples from Burgundy to Fountains, from Kirkstall to Byland, and other famous monastic churches. At the outset, he says we must guard ourselves against the misconception that there was ever any specially Cistercian style. What was specially characteristic in it arose from the Cistercian ideal of monastic life—simplicity and extreme asceticism. Gorgeous architecture and ornamentation were to the Cistercian monk of the earth, earthly. Naturally, therefore, in Cistercian buildings we find more or less uniformity, as in the pointed arch and the ribbed vault, and a general similarity of plan, though of course it was not possible for the Cistercians any more than for other innovators in architecture to ignore the building traditions of their time. In plan Kirkstall affords a typical example:—

A cruciform church, with a short presbytery or sanctuary to the east of the crossing; westward of the crossing of the long nave, the eastern part of which formed the choir of the monks (most frequently the monks' stalls extending into the crossing), and the western part of the choir of the conversi, chapels on the east side of each arm of the transept, and an aisle on each side of the nave to facilitate communication between the different parts of the church; such was the plan almost universally adopted in the golden age of the Order.

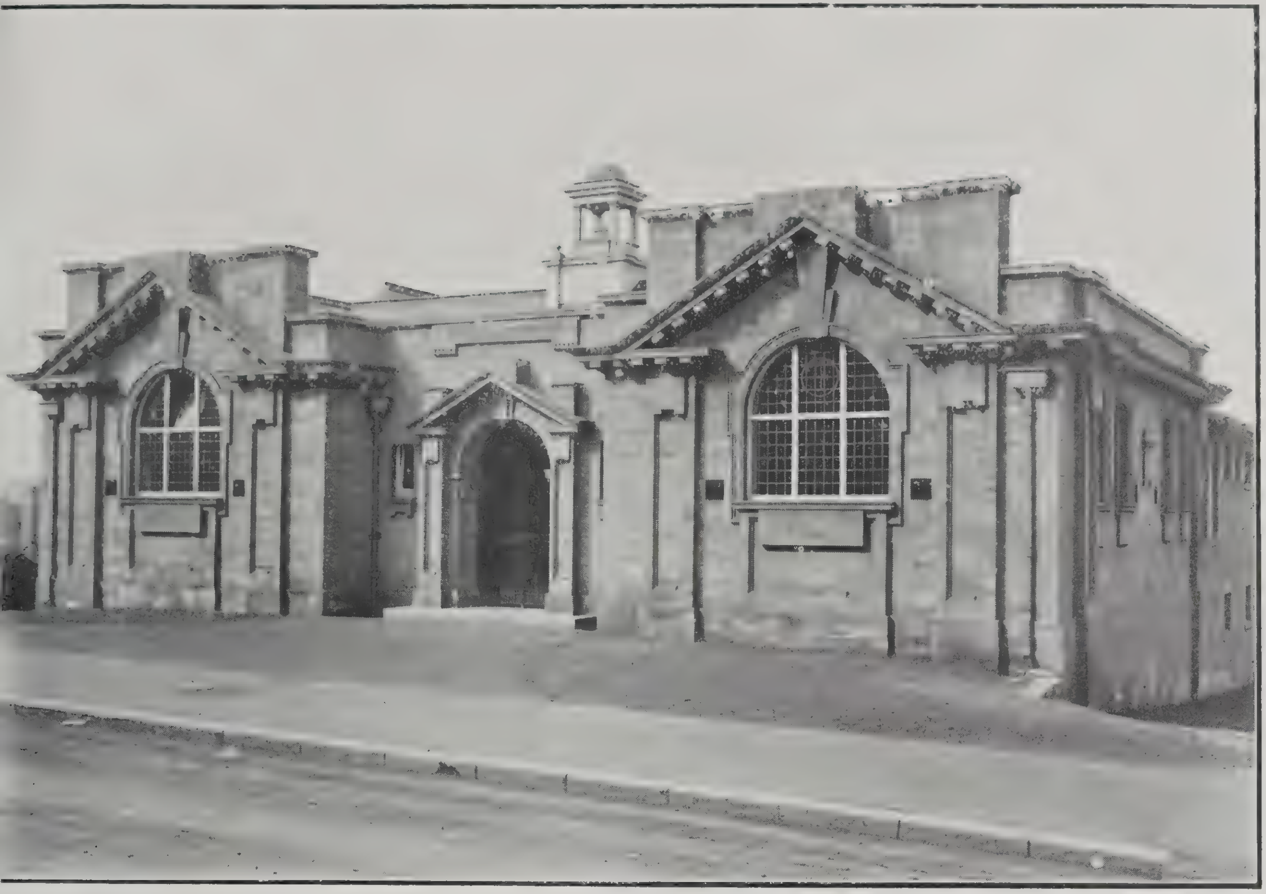
Variants of this plan, due to following local methods, are seen by reference to plans given of fourteen Cistercian churches. As to these local methods, Mr. Bilson remarks that considering the strength of local build-

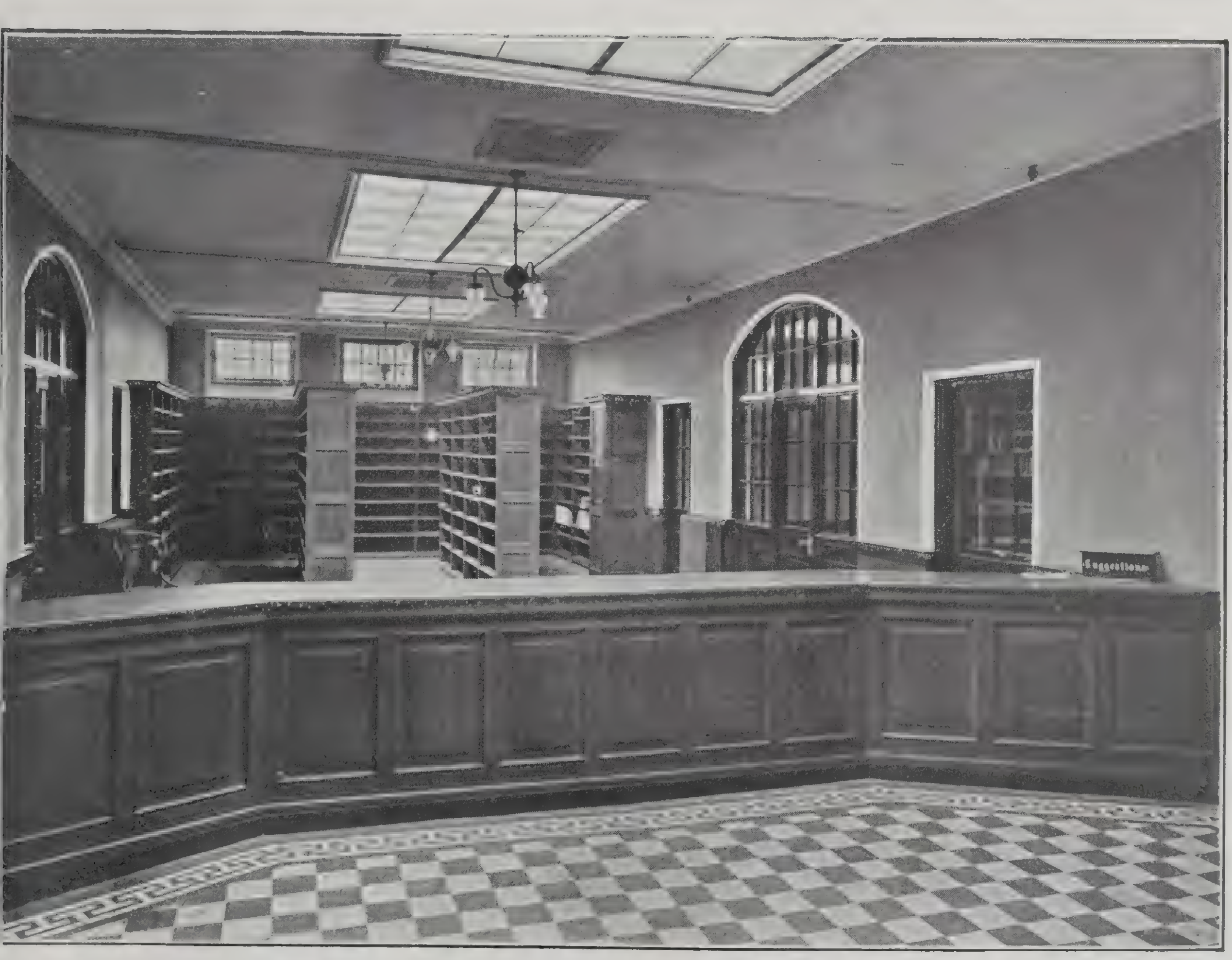




COTTAGES AT WALKER GATE, NEWCASTLE-ON-TYNE.

EDWARD CRAT





Photos: T. Lewis.

THE ANNFIELD PLAIN PUBLIC LIBRARY. GENERAL VIEW AND VIEW OF LENDING LIBRARY.

RCHITECT.

ing traditions in the twelfth century, it is a testimony to the discipline of the Order that their church plans so generally conform to the standard type. With the help of many photographic illustrations, it is possible to follow the changes and varieties in ornamentation which were gradually introduced. In the main arcades and the doorways at Fountains and Kirkstall, Mr. Bilson discovers how the English love of mouldings overcame Cistercian austerity; in the windows, also, the earlier work is much the more severe. With these and other details, Mr. Bilson makes a study of our remains of Cistercian architecture more fascinating and more informing than ever. Summing up, he describes the architecture of Fountains and Kirkstall as, with few exceptions, entirely Anglo-Norman. It is only in the latest work, particularly of Kirkstall, that we find any trace of foreign influence.

STRENGTH TESTS OF CEMENT.

The cement industry has developed to such proportions that it is now one of those selected for study by many statisticians when they desire to discover the scientific laws of growth, when they search for signs of returning prosperity during periods of depression, or when they enumerate the great industrial factors of the day. But no industry can serve such purposes with precision until the manufacture and use of its product have been carried to such a degree of perfection and the specifications covering its production are so well understood and so widely accepted that a true standard or standards for it may be considered to have been fixed.

In the case of cement, in spite of the promulgation of so-called official standard specifications for Portland cement by such bodies as the American Society of Testing Materials, with its special committee composed of engineers, manufacturers, cement experts and large users, the American Railway Engineering and Maintenance of Way Association, the National Association of Cement Users, and the American Institute of Architects, there still exists a considerable variation in the cement specifications prepared for large engineering enterprises like the New York rapid transit work, the New York barge canal work, the work under the Philadelphia Public Works Department, the Catskill water supply work, various parts of the Pennsylvania Railroad work, and also between them and the official standard specifications mentioned above. Several different points might be mentioned, but there may be taken as a single example the stipulation exacting a large percentage of increase of strength in standard mortar briquettes between the 7-day and the 28-day results, which requirement is to be found in several of the specifications in the list enumerated.

The specifications of the American Society of Testing Materials simply require "no retrogression," while ratios of increase up to 25 per cent. are required for the sand tests and up to 10 per cent. for the results from neat specimens by the contracts covering the supply of cement for several well-known engineering enterprises. This wide range of values is due to two diametrically opposed conceptions of the properties which an ideal cement should possess. On the one hand the idea is held that the best cement is one which hardens slowly and continuously, and it is contended that a product, which shows a low strength at the end of seven days, so that it is apt to develop a considerable increase up to the 28-day test period and thereby produces the increase specified, is also a cement which is more likely to continue to increase beyond the 28-day period. As to the accuracy of the latter contention numerous tests alone can decide. On the other hand, the opponents of the slow-increase theory maintain that the best cement is the one which secures its full strength at a very early period and thereafter is subject to none of the chemical or physical changes which are involved in the yet unexplained process of hardening. They further claim that the results of tests do not show that a cement which hardens slowly is ultimately any stronger than one which secures an early high strength, and actually cite the published experiments of one of the earliest proponents of the slow-hardening theory, according to whose tests that cement which had been rejected under the stipulation mentioned developed higher tensile strength after several years than did the one which had hardened at a slower early rate.

From an entirely unprejudiced point of view, it would seem (says a writer in an American contemporary) as if the whole basis of the controversy were wrong. It is well known that cement and the concrete in which it is employed are almost invariably stressed entirely in compression, and that the relation which exists between the tensile and compressive strengths of a given sample changes greatly with time and the method of test, so that both cements, the slow and the quick-hardening, may each be entirely satisfactory under actual working conditions, in spite of the results of tension experiments. Obviously, the sole reason for the existence of any specification is the necessity of obtaining an article which will stand the tests of time and

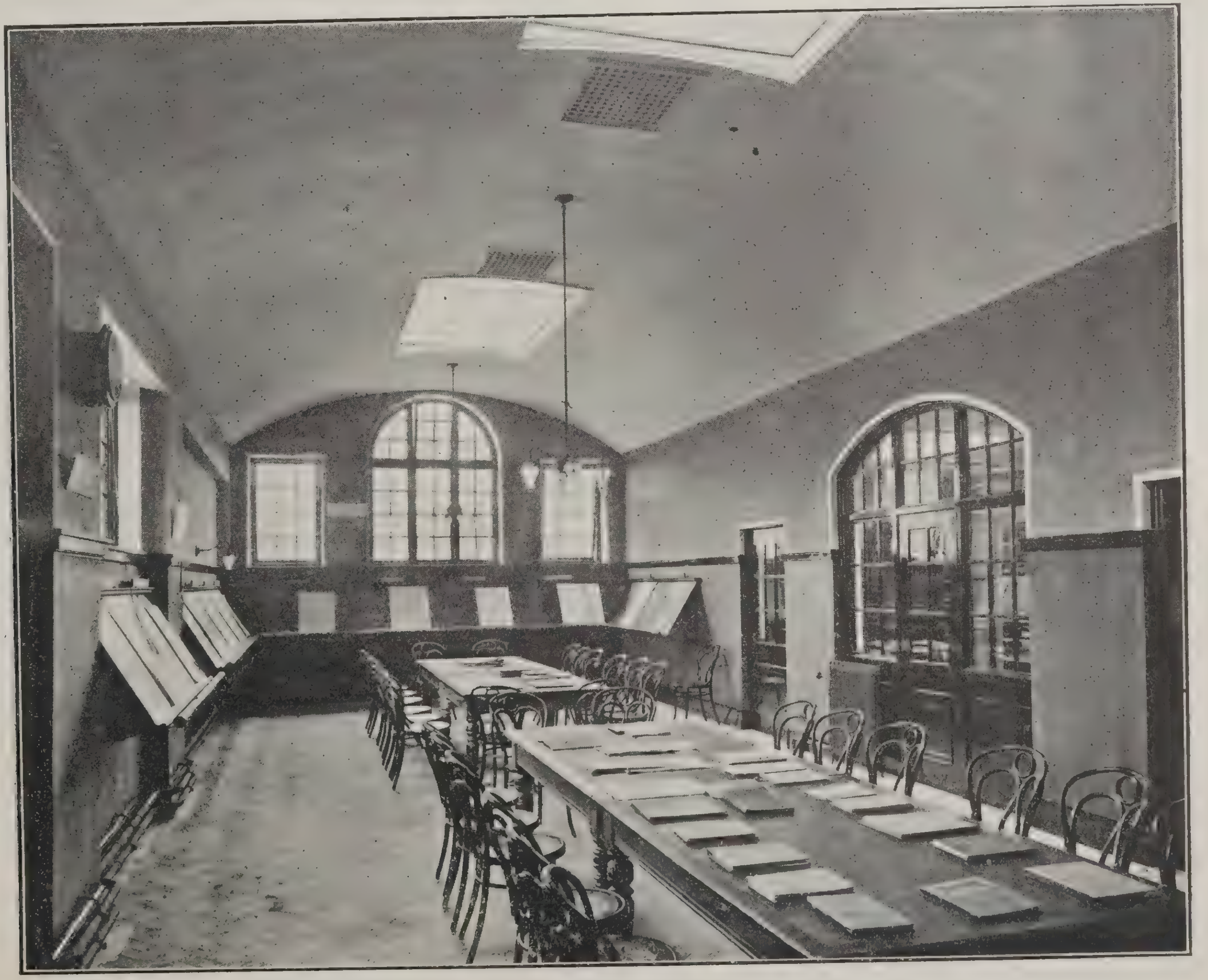
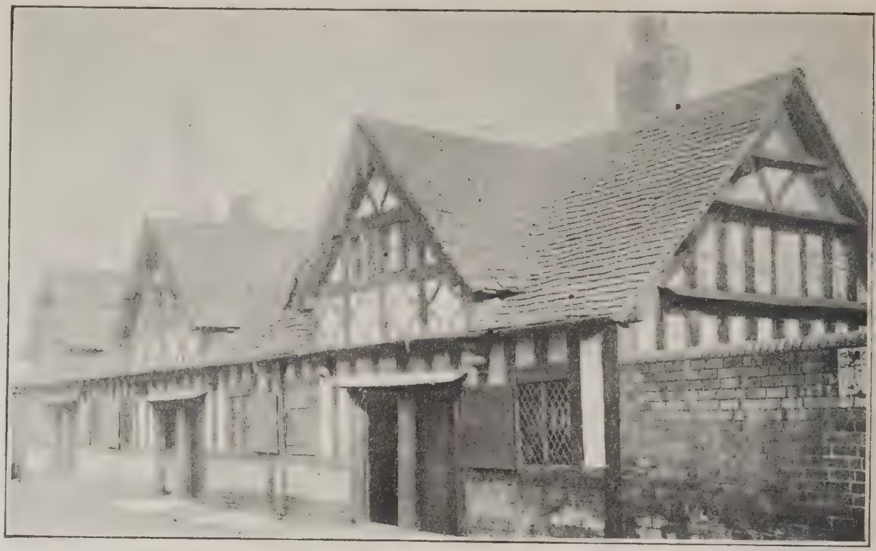


Photo: T. Lewis.

ANNFIELD PLAIN PUBLIC LIBRARY: THE READING ROOM EDWARD CRATNEY, ARCHITECT.

stress. Since it seems to be a fact that brands of cement of both classes have completely demonstrated their ability to withstand the requirements of long, hard usage in many well-known engineering structures which have stood for periods extending to a full score of years, it would appear as if a straw man were the present object of attack by both parties to the "rate of hardening" controversy.

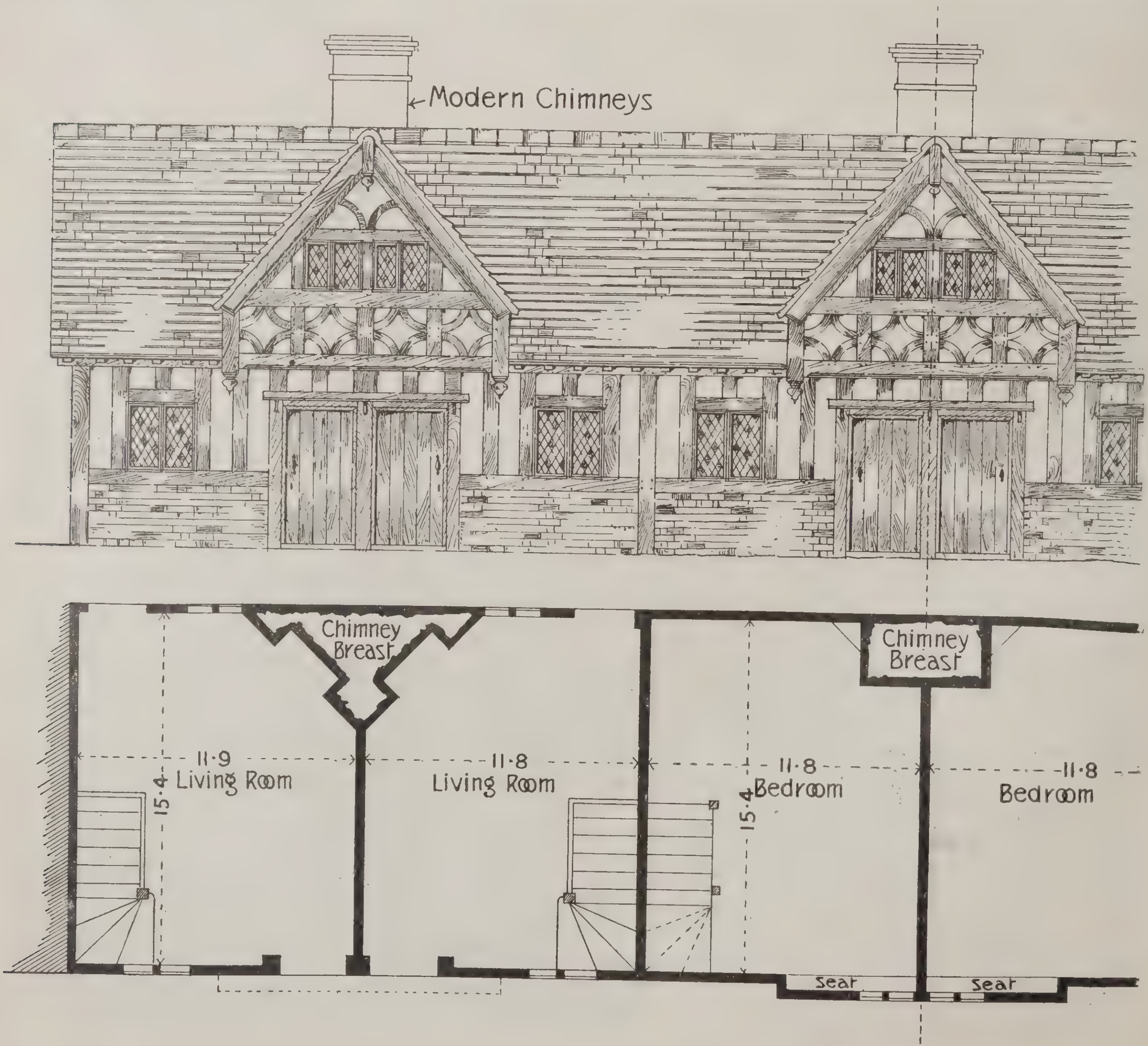
The only pertinent question to be settled is a purely economic one. Are the existing specifications for public works so drawn that, while they may admit only first-class brands of cement, they at the same time exclude other equally high-class brands without protecting the work against anything which is inferior? Were such the case, the tendency would clearly be to prevent the fullest competition, and thereby perhaps permit an unnecessary expenditure of public funds because of a possible increase in price or through delays in securing regular deliveries of what amounts to a special article. Engineers throughout the country can render their profession and the public a high service by studying the condition of existing concrete structures of as great age as possible and reporting the matter through proper public channels, including as far as obtainable all pertinent data as to the characteristics and early behaviour of the cement employed. Only through a careful analysis of a large mass of such data can any final deductions be made as to the real value of this and some other clauses in existing specifications; the apparently perfect condition of the large majority of engineering structures argues nothing but good both for the simplification of present specifications and the permanency of the work which has been and is being done.



OLD ALMSHOUSES AT HEREFORD.

OLD ALMSHOUSES AT HEREFORD.

The accompanying illustration shows a row of six old almshouses at Hereford, founded in the year 1630 for six poor women, either



Part of the Ground Plan.

Part of the Bedroom Plan.

FIG 1. OLD ALMSHOUSES, HEREFORD. MEASURED AND DRAWN BY HERBERT SKYRME.

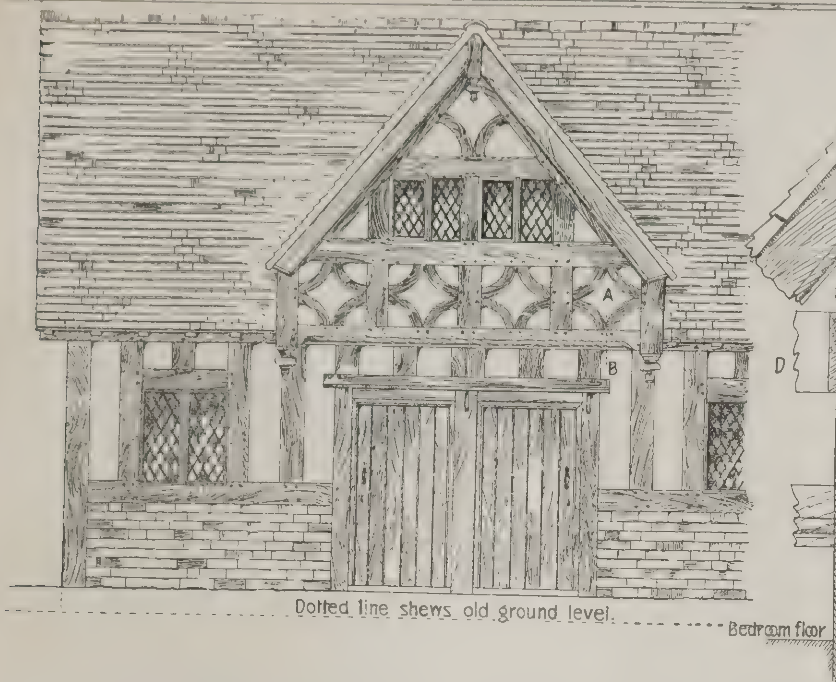


Fig. 3.—Detail of front elevation showing projecting gable.

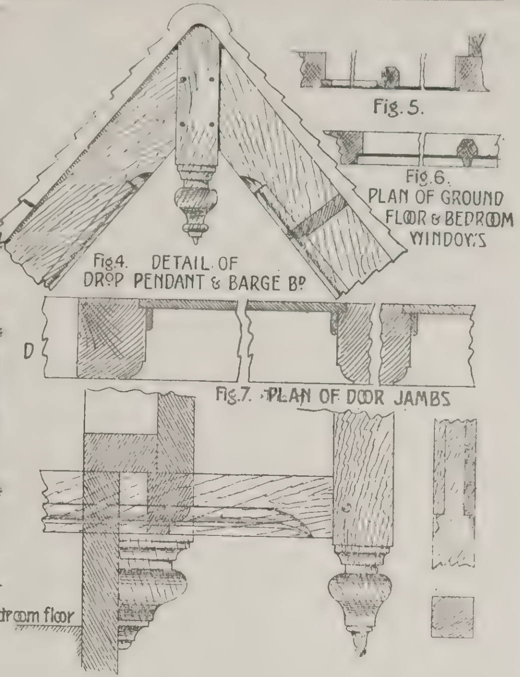


Fig. 5.
Fig. 6.
PLAN OF GROUND FLOOR & BEDROOM WINDOWS
Fig. 4. DETAIL OF DROP PENDANT & BARGE BD
D
Fig. 7. PLAN OF DOOR JAMBS
Bedroom floor

Fig. 9,—The Well to Staircase.

Fig. 8.—Elevation and section of projecting gable and drop pendant on line A. B.

OLD ALMSHOUSES. HEREFORD. MEASURED AND DRAWN BY HERBERT SKYRME.

widows or spinsters, whose age must not be less than sixty years. The charity is endowed with buildings and lands adjoining. The buildings became very dilapidated a few years ago, but have since been entirely renovated. They have been measured and drawn by Mr. Herbert Skyrme, architect, of Hereford.

A NEW TILE AND CONCRETE FLOOR SYSTEM.

The use of tile or similar filling material in long-span reinforced concrete floor construction in order to get depth without increasing the dead load too much has been tried with slabs reinforced in two directions at right angles to each other. In using ordinary building tile for this purpose, however, some of the concrete flows into the open ends, which are necessarily kept apart in order to allow for the transverse reinforcing rods, and the dead load is thus increased without adding to the strength. To prevent this, various methods have been tried, consisting generally in plugging the open ends. Another system, recently developed, for overcoming the difficulty has been used in the new Lafayette Street School, recently built in Newark, N.J.

This system employs triangular tile units which are assembled to make squares, their diagonal edges thus fitting together and preventing the concrete flowing into the cellular spaces. The blocks may be made of any desired dimensions, but in the Lafayette Street School they were 6in. high and of such size as to make, when assembled, 12in. squares. The flanges at the base of the blocks around the outside keep the blocks spaced at the predetermined distance, and allow room for the reinforcing rods. The form work required consists only of a platform supported from below at the proper floor height. Upon this platform the blocks are assembled, the rods placed and the concrete poured on top and finished off in the usual manner. When the concrete has set the supporting platform can be removed, leaving a very rough surface, to which the plastering or fireproofing may be directly applied.

The columns in this school were spaced so as to give a slab measuring 25×21ft. in the clear, and one of these, when 28 days' old, was tested, according to the requirements of the Board of Education, by placing in the centre of the span a 7,000lb. concentrated load upon an area about 2½ft. square. The floor slab was 8in. deep, consisting of blocks 6in. high, with 2in. of concrete on top. The test was not intended to be a specially severe one, and would probably have been carried to higher loads if the contractors had not been rushed. However, the panel showed no deflection with this load, and the test was therefore discontinued. In the course of construction another panel of the same size when ten days old carried a load of 15 tons of structural steel without deflection.

The construction was designed by Mr. Ferdinand Burchartz, architectural engineer, New York City.

A THEATRE FIRE.

A short paragraph in the newspapers of last Friday announces that the Theatre Royal and Hippodrome at Barry Dock was burnt down on Thursday afternoon. It is added that "the building, which was constructed chiefly of wood, with steel girders, was erected three years ago." It is a short life, and we trust that it has been a very merry one. The materials of construction, however, as described in the newspaper paragraph, do not suggest the up-to-date precautions which might have been expected in so modern a building of this class. The risks and possible consequences of fire in theatres and music-halls are so great, that the best known fire-resisting methods should be invariably adopted in constructing and fitting them. In the interests of public safety, the law should insist that places of public amusement should be built only of those materials and upon those principles which ensure the maximum degree of resistance to fire. The ample provision of exits is in any case necessary, but it does not exhaust the responsibility of the authorities with regard to danger from fire. Only an extremist would claim that the means of protection are now so perfect that, where they are fully adopted, it is impossible for a building to take fire; but, nevertheless, that consummation seems to be not unattainable; and modern systems of construction bring us almost within reach of it. But a building "constructed chiefly of wood with steel girders," does not seem to carry us very far towards the realisation of that ideal.

The Norwich Town Council have decided, on the expiration of the existing contract with the British Gas Light Company (Limited), to substitute electricity for gas for the lighting of the city streets.

Fire Prevention Notes.

America's Example. The Americans are more alert that we to take prompt and full advantage of all that scientific and industrial progress can offer them. With regard to fire-protection, it may be that their very exceptional experiences of tremendous loss of life and property by fire have taught them wisdom. It is to them, at any rate, that we are accustomed to look for thoroughness in the application of fireproofing principles. The most efficient fireproofing methods and materials are now being generally employed not only for large commercial and industrial premises, and for public buildings of all sizes and descriptions, but also, as we have from time to time recorded, in the construction of private dwellings. With the Americans, the question is not whether a building shall be fireproofed, but which of the several systems of fireproofing shall be adopted. Some considerable time must perhaps elapse before we in this country arrive at the same state of grace, but we must keep on persevering towards that desirable goal. If, like the people who came under the influence of Mr. H. G. Wells's benign comet, we could suddenly wake up wise, one of the very first steps taken towards redeeming our unregenerate past would be the wholesale fireproofing of our buildings. This very literal method of setting our house in order would for years to come absorb every available unit of unemployment in the building trade. The revolution is coming; but, failing the magic influence of the comet, it will be effected very gradually, and by such commonplace means as the persistent advocacy to which we have for a long time periodically devoted a considerable amount of space.

Fire Drill in Schools. An example of the value of the "fire-drill" which is now being practised in every public elementary school in London was afforded one morning last week when a fire broke out in a class-room on the second floor of the Ann Street schools of the London County Council, Ann Street, Clerkenwell. The moment the danger was appreciated whistles were blown, a bell pulled, and while quick march music was played on the pianos the 400 boys and girls who were in the different class-rooms promptly formed up in twos and marched out into the playground, where they stood at attention in double rows. The fire having been extinguished, the children marched in again in the same orderly manner. That is splendid so far as it goes—especially the piano-playing, to which Nero fiddling whilst Rome burned is an unworthy parallel. But discipline is only the first step towards education. The authorities might with advantage go much further. There is, we believe, no practical subject that could be more profitably taught than the first principles of fire-prevention. The subject, properly handled, could be made extremely interesting, and would in itself become no mean instrument of mental development. That would be one direct educative gain; another positive and direct advantage would follow the knowledge of how to prevent and how to deal with outbreaks of fire; and the children should receive practical instruction in the use of the minor means of prevention and extinction. A less direct but even more valuable advantage would be the raising of a vast body of citizens possessed of enlightened views and awakened sympathies on the larger aspects of the question. In a word, the most effectual means of popularising fire prevention is to get hold of the children. As a writer in the "Times" once pointed out, "if the householder, in particular, would look upon the risk of fire much as he looks upon the risk attending inefficient sewers, the field of the inventor and the manufacturer would be much enlarged"; and the present school-child is potentially the future householder.

Fires in Churches. In America, churches are being built of reinforced concrete; one of the latest examples being the Church of Our Lady of Mercy, in the Borough of the Bronx, New York City. The church is of reinforced concrete, and a steel frame supports the roof. In this country, where we are overmastered by sentiments and traditions from which the people of a comparatively new country are relatively free, we are not likely to emulate this example to any great extent, and even to hint at such profanity is to run the risk of being accused of sacrilegious heterodoxy—hard words which, for our part, we would not cast at a marauding cat. We do not suggest, therefore, that Kirkby Malzeard Church, which has just been restored after very serious damage by a fire that occurred in February 8th, 1908, should have been safeguarded for all time from a similar catastrophe by rebuilding it in reinforced concrete. We do think, however, that, fires in churches being extremely numerous, it might be possible to construct new churches on more up-to-date methods than are commonly adopted for such buildings, and that this can be done quite decorously The extent of the damage at Kirkby Malzeard may be inferred from the statement that in the work of restoration, which has been carried out under the direction of Mr. J. Oldrid Scott, as much as possible of the old stone has been used, but the greater part is new. All the pillars of the nave have been renewed. The new oak roofs assume the same low pitch as that adopted by Sir Arthur Blomfield for the chancel, when he restored the church about thirty years ago, and the lowering of the roof has emphasised the dignity of the tower. New floors have been laid, and that of the chancel is of marble. Handsome wood screens have been designed by the architect, but these cannot yet be executed, for want of funds. The chief contractors are Messrs. Barker Brothers, of Hampsthwaite. We are unaware whether the cause of the fire at this church in 1908 has been ascertained. Of course, the origin of outbreaks in places of worship is usually attributed either to the heating apparatus or to the carelessness of workmen, who use blow lamps or brazing tools, or who indulge in profane smoking while at work; but all these dangers are remediable, and in the absence of details, it may be tacitly assumed that, in restoring the church, material safeguards from fire have not been neglected.

Law Cases.

London District Surveyor's Fees.

At the Lambeth Police Court, before Mr. Hopkins, Messrs. Galbraith Bros., builders, of Camberwell Green, were summoned at the instance of Mr. Bernard Dicksee, district surveyor for Newington and part of St. George the Martyr, who sought to recover from the defendants the sum of £16 7s. 6d., being fees which he alleged to be due to him in connection with the erection by the defendants for the London County Council of a new school for defective children adjoining the John Ruskin School, Beresford Street, Walworth.

The point raised by the case was whether fees were payable to the district surveyor in respect of the erection of the building in question. In the case of the "London County Council and Willis," the Divisional Court held that the district surveyor was entitled to notice under the Building Act. Under section 201 of the Act, "public buildings belonging to or occupied for public purposes" by the county council are exempted from parts 6 and 7 of the Act. In support of the claim set up by the district surveyor, the plaintiff contended that this was not a public building occupied by the council for public purposes, and submitted that it having been held that notice of such works must be given to the district surveyor it followed that the district surveyor was to discharge his duties and receive his fees.

On behalf of the defendants, the necessity was urged of getting some further elucidation of the London Building Act in regard to buildings which were constructed by the London County Council as the educational authority, and the duties of district surveyors in reference to such buildings, and what fees, if any, were payable to district surveyors in respect of such duties as they had in reference to buildings of that character, if any, under the statute. In the case of the "L.C.C. and Willis," the only question which the Divisional Court specifically dealt with was whether or no the County Council should have given a notice to the district surveyor. The defendant's first proposition was that the giving of notice did not necessarily carry with it a right on the part of the district surveyor to receive any fees. Secondly, that this particular building was exempted by reason of section 201 from the provisions of Parts 6 and 7 of the Act, and, thirdly, that if the district surveyor had no statutory duties under Parts 6 and 7, he was not entitled to fees.

Mr. Hopkins reserved judgment.

Financing a Building Operation.

In the King's Bench Division on November 15th, Mr. Justice Sutton gave judgment in the action of Gray v. The Central London Properties Association, Limited. His Lordship said the plaintiff was Mr. Charles Gray, a builder, of Kensington, and he brought the action to recover £12,500 alleged to be due from the defendant company as an instalment on account of a contract to rebuild certain property in Hanover Square for £38,000. It appeared that the contract was made through a Mr. Gilbert, and that the defendant company was to advance the money as the building progressed. Mr. Gilbert became bankrupt, and, as he had arranged mortgages on the property with the defendant company, it was contended that the latter was liable for the first payment of £12,500, which became due when the buildings reached a certain stage. On the other hand, it was said that the building lease and other securities were now the property of Mr. Gilbert's trustee in bankruptcy, and that Mr. Gray was really only Mr. Gilbert's agent. The defendant company had entered into an agreement to pay the plaintiff, in all, £25,000, secured on mortgage, and the whole dispute appears to have arisen out of the bankruptcy of Mr. Gilbert. He had come to the conclusion that the agreement with the defendant company was one for good consideration, and was irrevocable, and not affected by the bankruptcy of Mr. Gilbert. He therefore gave judgment for the plaintiff, with costs, and with interest at 5 per cent. Mr. Hastings, for defendants, applied for stay of execution with a view to an appeal. Mr. Disturnal, for the plaintiff, pointed out that it would be a great hardship if plaintiff was kept out of his money any longer. The company had the building and the securities, and plaintiff had received nothing. Had he not been a substantial man he would have been ruined over the transaction. He asked that he should not ke kept longer out of his money. His Lordship refused to grant stay of execution.

Decision as to Altar Tables.

By a judgment of the Consistory Court, heard in St. Paul's Cathedral on November 16th, the use of marble tops for altar tables was held to be illegal. The case arose on the application of the Rev. E. R. Hudson, rector of Hayes, for a faculty to erect a new altar with a marble top in his church, as a memorial to the late rector. Dr. Tristram, Chancellor of the diocese, held that a marble top was illegal. Regarding cases quoted, notably Westminster Abbey, where marble-topped tables were in existence, he said it had not been the practice of the Court to remove those for which a faculty had in the past been granted, and apparently in the case instanced, the Crown had the option of granting or withholding privileges. The marble slab already executed could make a base for the altar, if desired.

Proposed New Works.

BRISTOL.—The scheme for the restoration and extension of the Bristol Fine Arts Academy is to cost approximately £10,000. Building operations, it is stated, will commence, after the spring exhibition.

GATESHEAD.—A L.G. Board enquiry into the application of the borough of Gateshead to borrow £9,400 for the purchase of the West Duddo Estate, in the parish of Stannington, for providing accommodation for lunatics, has been held.

MAIDSTONE.—In order to provide work for some of the unemployed during the winter, Sir Marcus Samuel has decided to erect a new pavilion at Mote Park county cricket ground, at a cost of about £2,000.

PRESTON.—A L.G. Board enquiry has been held at the County Hall, Preston, into an application by the Lancashire County Council for sanction to borrow the sum of £20,000 for the extension of the County Office in Fishergate Hill. The site of the proposed extension has already been provided.

STEPPS.—Alternative plans have been submitted for an extension of Stepps School, by Mr. Fairweather, architect, of Glasgow. In the one case five rooms are shown, giving accommodation for 300 children. The other plan provides for a two-storey extension, giving eight rooms, or accommodation for 480 scholars. The first scheme is estimated to cost from £3,150 to £3,500, while the second is estimated to involve £4,800 to £5,200.

THORNE.—It is proposed to erect a school for 100 boys and girls, at a cost, including equipment, of £6,000. It was announced recently that, five acres of land were to be given as a site by the Governors of the Grammar School, and the County Council was willing to contribute £500—one-third of the estimated value. The annual maintenance was put at £1,300.

WINNIPEG.—The question of the construction of a new Provincial Parliament building is under the consideration of the Provincial Government. In all probability the construction of a new House will be begun early next year. The present legislative buildings have long been too small for the needs of the members, and inadequate to the position in the Dominion of the province of Manitoba.

MAXIMILIAN PLATZ, VIENNA. A TRIANGULAR GARDEN PLACE.
(From "Town Planning, Past, Present, and Possible.")

Views and Reviews.

*Triggs on Town Planning.

There seems likely to be no want of light and leading on the highly important subject of Town Planning, on which so large an interest has been focussed by Mr. Burns's Bill. Mr. Inigo Triggs was first in the field with the excellent book now under review. Mr. Raymond Unwin's followed close on its heels, and other volumes are on their way. One may reasonably doubt whether there is a public numerous enough to absorb so much pabulum, and satisfy the authors and publishers. However, for the student it is all gain to have the subject attacked from varying points of view.

As is natural with one who has given so close an attention to formal design in gardens, to the enrichment of our libraries, Mr. Inigo Triggs leans markedly to the School of Town Planning which demands the grand manner. When architects have got more familiar with the problems involved, and the practical working of town planning schemes gives more material for criticism than England yet affords, it is likely that no small bickerings will arise. It needs no very abstruse or elegant spirit of prophecy to discern that the conflict will be waged between the classical and picturesque schools of thought. In that conflict we doubt not Mr. Triggs will be found on the side of the classicists. Indeed, from the fact that he dismisses Camillo Sitte with a short reference, it would seem that he has small sympathy with the town planners who base their schemes on the effects which abound in mediæval German towns. It seems clear, however, that the advocates of the grand manner, the disciples of l'Ecole des Beaux Arts, will have for some time small opportunity in England to exercise their art. It is unlikely that a nation, so indifferent to matters architectural as we are, is likely to contemplate any such schemes of remodelling as the Second Empire made possible in Paris. Such intelligence and effort as may be brought to bear will be exercised on suburban extension, and rows or squares or crescents of villas and cottages give small scope to large ideas, and must necessarily develop rather on village than on city lines. We think, therefore, that Mr. Triggs has been wise to devote an important chapter to town expansion, in which he describes Letchworth, the Hampstead suburb, and other healthy experiments and projects. On the larger aspects of town planning, Mr. Triggs acutely points out that the splendid foresight of Paris and its resolute carrying out of large projects on a definite plan over a long period of years has brought to the city a great access of material prosperity. If town planners can preach this gospel of "honesty is the best policy, *and pays best*," they are more likely to achieve results than if they hitch their waggon to the star of artistic righteousness. Until, however, there is such a change in the official attitude towards architects as manifested itself in the total ignoring of the profession in the matter of the Royal Commission on London Traffic, we incline to take a gloomy view. In no other nation would it have been possible for such a body to sit and report without a single architect, either as commissioner or witness. Mr. Triggs's book is large and long, and it is not possible to do more than touch on a few points that he raises. The gridiron plan is doomed: the experience of New York is evidence bitter enough as to its failure. It seems likely that the general lines of future city planning will run on a combination of the chessboard and radial schemes, for a purely radial system provides many sites of awkward shape. The question obviously needs to be approached from many sides, and much scientific observation of the behaviour of traffic, and especially of mixed speeds, will be needful before any sound body of doctrine is evolved. The gyratory traffic diagrams which Mr. Triggs reproduces are peculiarly provocative of thought. On the historical side the book is admirably equipped, though we think the plan of Silchester might have been included as the only perfectly explored Roman town in England. One piece of golden advice we trust may be followed; Mr. Triggs issues a warning against reliance on preconceived ideas. He quotes with approval the words of Stubben, "The day has gone by for the unqualified employment of definite systems; henceforth they should not play a ruling but a subsidiary role."

Of uniform treatment for streets leading to an important architectural termination, of arcades, of covered streets, of tree planting, and a thousand other things germane to his subject, Mr. Triggs discourses ably and in detail.

Of maps and plans there is an admirable series, while the photographs of Continental cities are not only valuable in themselves, but are calculated to produce in the minds of those who see them, that divine discontent which is the seed of reform. We hope architects will make themselves possessed of Mr. Triggs's accumulated knowledge, but still

STREET ARCADE AT BOLOGNA.
(From "Town Planning, Past, Present, and Possible.")

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*Town Planning: Past, Present an Possible. By H. Inigo Triggs. 10 in. by 7½ in. pp. xx. 334. Illustrations 173 17s. net. London: Methuen and Co., 36, Essex Street, W.C.

more, that the official world will feel that they have no longer the excuse that none has preached to them.

Miscellaneous.

We have received "The Mechanical World" pocket diary and year book for 1910, now in its 23rd year of publication. It contains a large collection of notes, rules, tables, and data for mechanical engineers, and includes sections on:—Steam and the steam engine; steam turbines; steam boilers; gas engines; oil engines; suction gas producers; beams and girders; centrifugal pumps; ball bearings; notes on shafting, wheel gearing; belt driving; rope driving; wire ropes; notes on screw cutting; tapers and angles; and speeds and feeds for high-speed steel tools. Price:—Cloth, 6d. net; by post, 8d.; leather, gold blocked and gilt edges, 1s. 6d. net; by post, 1s. 8d. From any newsagent, or from Emmott and Co., Limited, 65, King Street, Manchester.

We have also received the year book of The Alberta Association of Architects, for 1909.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable and it must be understood that both question and reply will, as a rule, be published in these columns

Hammerbeam Roof Truss for Church.

Leicester.—P. H. G. writes:—"Do you consider that the accompanying section of a church roof truss shows sound construction?"

The truss has been redrawn, with additional bolts and plates, to cover the joints, and the insertion of a wall piece above the hammerbeam. This should make it satisfactory.

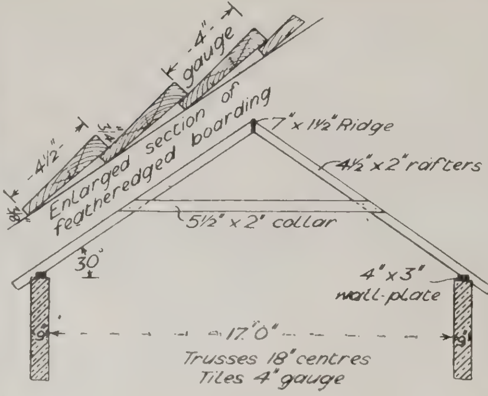
Henry Adams.

Roof Truss for Motor Garage.

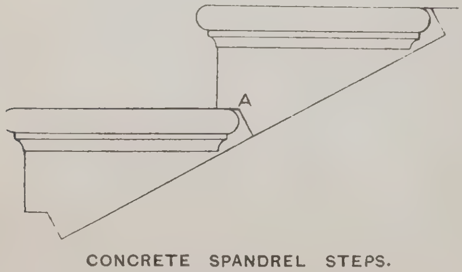
Kingston-on-Thames.—"B. G." writes: "A motor garage, 17ft. by 17ft. on plan, is to be erected. What are the smallest members that may be used in the roof? It is proposed to use wrought-iron rods or bars for all members except the principal rafters, which will be deal."

—There is no occasion for any ironwork in this roof; an ordinary collar beam truss may be used. This is formed as in illustration herewith, the trusses being not more than 18in. apart. If the spacing is increased, the scantlings must be increased also.

Henry Adams.



A MOTOR GARAGE ROOF.



CONCRETE SPANDREL STEPS.

Measuring Concrete Spandrel Steps.

Leicester.—J. A. L. writes: "The London Building Acts (Amendment), 1905, requires concrete spandrel steps for staircases 4ft. 6ins. wide to be not less than 4½ins. thick in the smallest part. Which of the modes shown in the enclosed sketch is correct?"

—Neither of the modes of measurement suggested is correct. The official measurement for least thickness is taken from point A on sketch herewith, and there must be at least 4½ins. in the shortest direction, which will be at right angles to the soffit. Spandrel steps are therefore an unsuitable shape for compliance with these regulations.

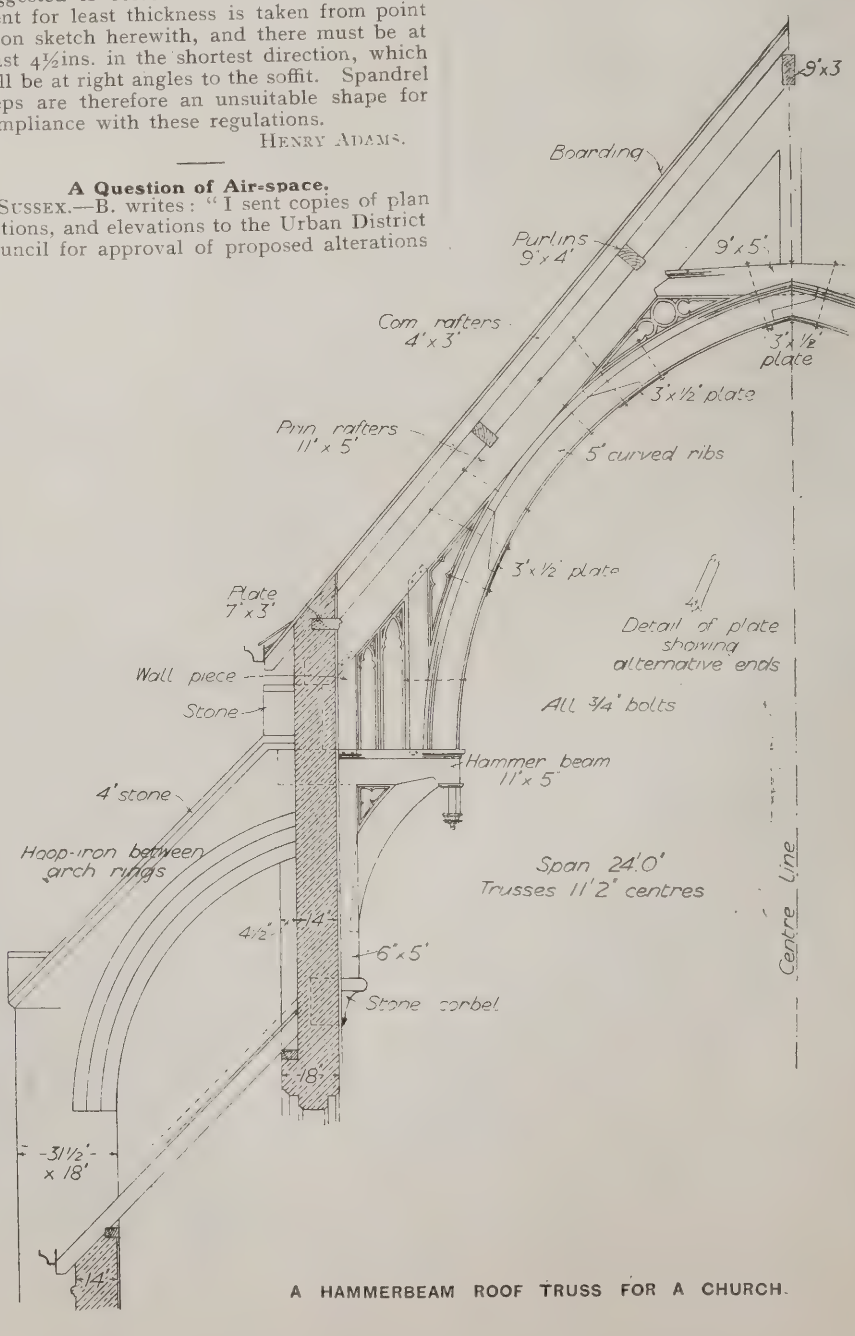
Henry Adams.

A Question of Air-space.

Sussex.—B. writes: "I sent copies of plan sections, and elevations to the Urban District Council for approval of proposed alterations and additions. They disapproved on the ground that there is not 24ft. free air space in front of same—A's garden intervenes. A has no objection to the alterations. Could I say the front was the back, and declare the 24ft. free air space facing the lawn and garden? Could you suggest any way of my erecting the proposed alterations and additions? And do you think the Council have taken a proper view of their by-laws?"

—So far as can be ascertained without access to the by-laws in force in the district in question, a by-law to the above effect is lawful, and may be enforced. S. 157 (3) of the Public Health Act, 1875, clearly provides that a local authority may make by-laws with respect to (*inter alia*) the sufficiency of the space about buildings "to secure a free circulation of air." It is not a question of ancient lights or blocking up windows. While it may well be that the adjoining owner has no intention of building on his land, this is not a fact of which the local authority can take cognizance. So far as that body is concerned, it cannot compel him to refrain from building. As to the plan submitted, there does not appear to be any very simple method of so altering it as to provide the necessary air space, and yet carry out the proposed alterations. It will not avail anything to call "the back" "the front," as "front," in relation to building by-laws, has a definite technical meaning.

Barrister.



A HAMMERBEAM ROOF TRUSS FOR A CHURCH.

Societies' Reports.

Glasgow and West of Scotland Technical College Architectural Craftsman's Society

At the third meeting of the session, held in the Technical College on the evening of the 5th inst., Professor Gourlay, B.Sc., A.R.I.B.A., read a paper entitled "The Building of a House." Beginning by defining building construction as the sum of all the building crafts controlled, as regards design, by the master mind of the architect, the Professor proceeded to treat his subject on the basis of this definition. He pointed out how fundamentally necessary it was that the student should study at least one entire building to enable him to appreciate the many varied processes which are involved in the construction of building. To emphasise this view, he then showed a series of slides giving complete working drawings for a country house, in which as many different constructional details had been included as possible, while maintaining the unity of the design as a whole. In conclusion, he urged the importance of all architectural craftsmen pursuing a general course of this nature in building construction.

The Institution of Municipal Engineers.

At a meeting held at Norwich, on Saturday last, the Eastern District Committee of the Institution was formed. Among those present were Messrs. S. G. Bloy (Mutford and Lothingland) in the chair, Thomas Brown (Norfolk), R. G. Coates (Norfolk), R. Croome (Cromer), B. Gibson (Norfolk), H. G. Kaines (Norfolk), Robert Nelson (Norfolk), Andrew Patterson (St. Faith's), and D. S. Scoones (Norwich), together with Mr. B. Wyand, secretary of the Institution. Mr. J. H. Webb, borough surveyor of King's Lynn, was unanimously elected district chairman, and Mr. R. G. Coates, district surveyor of the Norfolk County Council was unanimously elected honorary district secretary. It was decided that, subject to Mr. Webb's approval, the first meeting of the committee should be held at King's Lynn.

Illuminating Engineers.

Professor Silvanus P. Thompson, presiding last week at the inaugural meeting of the Illuminating Engineering Society at the Society of Arts, said that in these days when so many associations existed for the diffusion of knowledge, the founders of a new society must be prepared to show either that there had arisen some new science, industry, or art, or that in the organisation of sciences, industries, or arts there had arisen some real need which the existing societies failed to meet. He had no hesitation in asserting justification for the existence of that society. It was founded to bring together all those interested in the problems, practical and theoretical, of the art of directing and adapting light, that prime necessity of civilised and uncivilised existence. To utilise light properly without waste was the business of those who would join that society; they were concerned with many things other than the mere production of light. Illuminating engineers were engaged in the utilisation of light in illumination; to spread knowledge about this was one of the objects of that society. No society had hitherto been organised to promote the interests of illuminating engineering. For only one hundred years had there been any systematic means of illumination in use in any civilised country, and for only about half-a-century had there been any real development of organised illumination. All the newest things in gas lighting and electric lighting were the efforts of only a few years. We were in the middle of an immense revolution. Illuminating engineers dealt with lighting rather than light; their primary concern was the adequate and proper illumination of things. Foremost in the programme of the society was the question of measurement; agreement, national and international, was required as to what should be taken as the unit of light. Information was wanted as to the specific brightness of surfaces of different kinds when subjected to light. The lighting of schoolrooms was all-important. The bad results which came from the imperfect illumination of schools was much to be deplored, for they imperilled the eyesight of the next generation. The first paper to be discussed before the society would be on the subject of glare and its avoidance. There were plently of questions of public, private and scientific interest for the consideration of the society, which he thought would have a great future.

Mr. L. Gaster (hon. secretary) read the report of the Council, which showed that the society started with a membership of 164 and a large number of prominent vice-presidents.

On the proposition of Sir Boverton Redwood, the president was thanked for his address.

Here and There.

Canterbury Contentions. Mr. W. D. Caröe, in a letter to "The Times" of the 17th inst., has replied to one or two criticisms of his statement of November 4th on the Angel Steeple, Canterbury. Mr. Caröe admits an inadvertent slip in writing of the work of facing the Norman piers as by Chicheley, when he meant Archbishop Courtney, who provided the funds for Prior Chillenden to rebuild the nave. But as Courtney, Chillenden and Chicheley were all in the world together, this inadvertence in no way affected the architectural issue. Mr. Caröe says he described this casing of the Norman work "in so vivid a manner," proclaiming the "complete separation between the old and new [work] wherein no mortar, as far as could be seen, had clung to the older work," that his statement does not seem capable of misconstruction. This is in disproof of Mr. St. John Hope's thesis that the perpendicular casing was built against the Norman work, and that the space found by Mr. Caröe between the casing and the original piers was not intentional, but due to buckling as a result of undue stress on the newer work. Mr. Caröe adds:—"As to causes and effects in a piece of work imposing on the mediaeval builders problems of much technical difficulty, a practical knowledge of building is a useful antidote to hasty conclusions."

Mont St. Michael. Before the Manchester University on the 15th inst, Professor Capper delivered a lecture on Mont St. Michael, probably the most unique of all Benedictine Abbeys, situated on the north coast of France at the junction of Normany and Brittany. Illustrating his subject with lantern slides the lecturer showed views of typical Benedictine abbeys in England, or what remained of certain of them in Durham and Canterbury, and said that Chester Cathedral gave them a very fine opportunity, near Manchester, of studying what one of these ancient buildings was like. Discussing the domestic buildings of Mont St. Michael, he showed the remains of the early architectural work of the twelfth century, and especially the crypt on the north wing by Abbot Roger II.; and then discussed in detail the grand building on the north side of the abbey, known as La Merneille, erected from 1203 to 1228, and which took the place of the earlier building which was apparently destroyed in the Breton revolt under Theuars in 1203. He drew attention to the fact that in building this particular abbey the monks had made unusual arrangements owing to the peculiar exigencies of the site, the almonry and the guest-house, as well as the more private buildings of the monks, such as the cellarium, the day-room, the refectory, and the cloister being in three grand stories towering on the north side of the structure. In conclusion he pointed out the severity and lack of ornament which characterised all the architecture of the buildings, and said the whole had seemingly been designed and carried out for a utilitarian point of view; and suggested that this went far to dispose of Ruskin's theory that ornamentation should be an essential characteristic in architecture.

"The City Beautiful." Mr. Edmund Rathbone delivered a lantern lecture, in the Picton Hall, Liverpool, on the 16th inst., on "The City Beautiful; or, Liverpool Compared with Cities Old and Modern." The lecturer referred to the recent formation in Liverpool of a society called the city Guild, whose object is was to assist in the preservation and increase of the natural and structural beauties of the city and neighbourhood, by securing public interest in these matters, its objects being to advocate improvement schemes, to advise in regard to the rebuilding of old districts and the laying-out of new ones, the placing of public monuments, and the regulation of hoardings and advertisements. The society was anxious to encourage the provision of open spaces, the cultivation of trees, and the abatement of the smoke nuisance, and to render assistance to the public authorities, if required, in the selection of works of art, and to support public performances of music. In Liverpool they were indeed fortunate in having such fine buildings as the Dock Board Offices, the Royal Insurance Buildings, and the Liverpool Exchange to adorn their city. Many of their best buildings, however, were marred by blatant advertisements, and the noblest architectural compositions were ruined by huge announcements, which distracted the eye and made their streets hideous. The depressing pall of smoke hanging over the city soon blackened their yellow stone buildings and neutralised every effort of those who would create a city beautiful. From his own office window the lecturer could see the chimneys smoking away furiously all day long. He believed that all this was preventable. Everywhere the beautiful flowers, shrubs, and grass were railed in in prison-like fashion, and the children could hardly see them at all. People must be educated to take care of the public gardens themselves, and he believed that they would learn to respect their common property if encouraged to do so by the authorities. He understood that in Paris trees were not planted out until they had grown to a considerable size, and that great precautions were taken in their removal. Indeed, a special official was set apart to look after the trees of Paris.

The Strength of Coke Breeze and Stone Concretes. Tests of coke breeze and stone for concrete aggregates have been made by an engineer in Elkhorn, Virginia. The breeze weighed 27lb. per cubic foot, the specific gravity was 0.905, percentage of voids 49.28, and water absorption 30.9 per cent. Ordinary cement and sand was employed, and as test pieces nine mine props were constructed, 8ins. in diameter and 30ins. long. Four mixtures of cement, sand, and breeze were made, and the initial loads were 1,000 lbs., with increments of 5,000 lbs. The following results were obtained:—

	Cement.	Sand.	Breeze.	Breaking load in lbs.	Strength in lbs. per sq. in.
Mixture 1	1	2	3	85.567	1,699
,, 2	1	2	4	88.167	1,752
,, 3	1	2½	5	79,334	1.576
,, 4	1	3	6	59.750	1,187

The figures for the stone concrete were furnished by Professor E. J. McCaustland, at Ithaca as follows:—

	Cement.	Sand.	Stone.	Breaking load in lbs.	Strength in lbs. per. sq. in
Mixture 1	1	2	3	151,100	1,872
,, 2	1	3	4	122,200	1,472
,, 3	1	2	5	128,100	1,483
,, 4	1	3	5	120,933	1,504

The Wrong Way to Build. The Camberwell Guardians require a temporary building for the accommodation of workhouse nurses, and it was recommended that, subject to the approval of the Local Government Board, a temporary iron building should be erected, the work to be done by the carpenter, with inmate labour, and with the help, if necessary, of one or two outside assistants. This is altogether the wrong way to build, and it is gratifying to note that the recommendation was not passed without an important modification in favour of open tendering. It was urged in vain by one of the members, Mr. St. Cedd, that the building should not be lined with wood, but with some fireproof material, and his citation of the case of Colney Hatch in evidence of the danger of wood-lined buildings was lost upon the Guardians; but the objection by Mr. Pegler that the work should not be carried out by inmate labour seems to have had a direct effect upon them, for ultimately it was decided to invite estimates for the supply and erection of the building.

The Property Market Index. The estate market affords a rough-and-ready index to possibilities in the building trade, which, to some extent, moves in sympathy with it. It is therefore reassuring to know, on the authority of the "Times," that "the undertone of the market is not unsatisfactory," and that "signs are discernible that, with a clearing of the political atmosphere, there will be a revival of activity." The aggregate transactions at the Mart, in the country and suburban sale-rooms, and privately, as reported to the Estate Exchange, this year are £5,839,229, against £5,259,258, in the like period of 1908

AN IMPROVED SYSTEM OF BRICKLAYING.

Concrete has made such rapid progress during the past few years, and has, in so many cases, proved such an important competitor to bricks as a building material, that it is of the greatest importance that all interested in the use of bricks should use their best endeavours to reduce the cost of bricklaying to a minimum, without in any way decreasing the stability of the structure, if this is at all possible.

A number of variations from the ordinary practice which have been made by Frank B. Gilbreth in the United States are of more than passing interest. Mr. Gilbreth has for some years had a high reputation for rapid erection, and is one of the most successful contractors in America, and he has brought to bear upon the subject of bricklaying a wealth of ideas and suggestions that are remarkable not only for their novelty, but for their practical value. His national reputation for the execution of large contracts in a phenomenally short time is a guarantee of the success of his methods.

The Scaffol'.

In the first place, the scaffold used by Mr. Gilbreth is arranged in such a manner that the bricklayer does not need to stoop unduly over his work; the argument being that as a carpenter does not stoop to the floor to plane a piece of wood, but works with the wood on a bench, so the bricklayer should work in a position best calculated to enable him to work with the greatest possible speed and with the least waste of energy by unnecessary movement. The Gilbreth scaffold is so constructed that it can be raised and lowered so readily that the workman does not need to stoop an inch lower than the height best fitted for his work.

The Fountain Trowel.

A further saving of time is effected by the use of a special trowel, which is as different from an ordinary one as a fountain pen is different from a pen of the ordinary kind. Just as a writer may increase the speed of writing by using a fountain pen and so avoiding the frequent journeys to the inkstand, so the bricklayer working on the Gilbreth system may save nearly a quarter of his time by discarding the ordinary trowel and using one with a much larger supply of mortar—in other words, a fountain trowel. Such a trowel is in the form of a long can, somewhat resembling a shoe, one end of which is flattened so that it may be used to scrape or scroop up the mortar in order to fill the trowel, whilst the other end has an opening so adjusted as to give a stream of mortar of the correct width. It is claimed that this device enables the mortar to be spread much more rapidly and evenly than usual, and it permits the mortar to be used sufficiently soft to fill the joints better than usual, particularly in the middle of the wall.

The "Packet" System of Bricklaying.

In the ordinary method of bricklaying, a large amount of time is lost by unnecessary handling of bricks by the bricklayer. Much of this is avoided by Mr. Gilbreth in what is termed the "Packet" system. This consists in the substitution of a definite arrangement of the bricks directly they leave the cart which delivers them on to the site, so that, with a minimum of handling, they are ready for laying.

For this purpose a small wooden pallet or tray is filled with bricks on edge in two rows of ten each, this work being done by labourers. The "packets" are then carried to the bricklayer, who picks up the bricks one at a time and places them on the wall. The time saved by the layer not having to select his bricks (front bricks can be piled in separate packets) nor to pick up parts instead of whole bricks is very great, as the sorting can be done by less highly paid labourers, each kind of brick being placed on a separate packet. Mr. Gilbreth states that he has proved by long practice that a bricklayer's output may be doubled by the adoption of this simple system, and the saving on the cost of laying is still further reduced by the saving in handling the bricks in packets as compared with the ordinary method.

Thus, everyone who has watched a bricklayer at work knows that he turns a brick about in his hand before laying it. This is necessary for him to find the best face, and to grasp the brick properly for laying. In the "packet" system, the bricks are so laid as to be in exactly the right position for laying, and all this unnecessary handling is avoided.

In these ways the system of working adopted by Mr. Gilbreth is capable of effecting a mild revolution in bricklaying, and one which is not likely to be resented by any one, as the bricklayer works less although he lays more bricks, and no reduction in actual wages takes place. The great difference is that time and energy which are now wasted are devoted to bricklaying, and consequently the employer benefits as well as the men.

COST OF CONCRETE BUILDINGS.

Reinforced concrete will generally run from 5 to 15 per cent. higher in first cost than first-class mill construction, and will be from 10 to 20 per cent. lower than steel construction fireproofed. A large warehouse in Brooklyn was begun in May, 1908. At that time new construction work was scarce, and all contractors figured very closely. The successful reinforced concrete figure was $30,000 lower than the best bid on the same plans in fireproofed structural steel. A large factory in Philadelphia was designed in steel. The architects considered an alternative in reinforced concrete and saved $60,000. A large publishing house and loft building was recently completed in Springfield, Mass., of reinforced concrete throughout, thereby saving $40,000 over the probable cost in steel. These three instances represent respectively savings of 12, 25, and 10 per cent. In competition with mill construction the percentage depends almost entirely on the size of the building. For structures costing $40,000 and less, and of a height of four stories or less, the brick and wood construction will run about 15 per cent. less than concrete. On larger buildings, however, concrete gets closer to the cost of the mill construction. The designers of a very large hardware building in Minneapolis were surprised to find concrete figures slightly under those of mill construction. A similar case occurred in Toledo, Ohio. Both of these propositions exceeded $150,000 in value.

In considering the costs of different types of construction the initial cost should not be the only criterion. There are certain fixed charges which enter into the relative values of buildings. These may be briefly summarised as follows: Insurance, maintenance, depreciation, amount of light available, freedom from vibration, elimination of vermin, and the assurance that a fire cannot destroy the building. It is difficult to put an exact monetary value on these different items. Each plant manager would have his own views and local conditions would alter materially any assumptions. If, however, due consideration be given to the saving which can be obtained on each of these items by the use of reinforced concrete building, it will generally be found that even though the concrete structure cost complete 10 per cent. more than mill construction, there will be a saving annually of from 1½ to 2 per cent.

These conclusions were drawn by Mr. J. P. H. Perry, of New York City, in an address on the use of reinforced concrete for textile mills, at a convention of the (American) National Association of Cotton Manufacturers.

Federation News.

Northern Counties Federation.

A meeting of the Executive Council of the Northern Counties Federation was held at the Douglass Hotel, Newcastle-on-Tyne, on November 15th, Mr. J. Davison (Stockton-on-Tees), president, in the chair, when there were fourteen members present.

Arising out of the minutes, a report was given by the Teesside secretary on the question of the alteration to the Teesside working rules, which were to be further discussed by them at a meeting with the operatives to be held on November 16th.

A letter received from the Quarry Owners' Association of the Tyne district, was read, intimating that as a result of a demand for a reduction of the wages of their workmen (other than stonemasons), the men had come out on strike, and asking for a conference with the Federation upon the matter. A deputation was received from the Quarry Owners' Association, when a mutual understanding was arrived at between the two bodies to assist each other in cases of necessity, and for the observance of their respective working rules.

The secretary read the correspondence which had passed between the Northern Centre, the Yorkshire, and this Federation with respect to uniform rules for the three Federations comprising the Northern Centre, and reported that he expected the secretary of the Northern Centre would be calling a meeting to discuss the form of rules previous to bringing them before the Federations. The action of the secretary in corresponding upon the matter was confirmed.

The question of the issue of a year book was considered, along with the different quotations. After considerable discussion, on the motion of Mr. J. W. White, seconded by Mr. Masters, it was resolved "That, providing £20 of advertisements can be secured, the issue of the Year Book be proceeded with."

A communication received from the National Federation was read with respect to a Departmental Committee on Railway Agreements, together with correspondence thereon, asking this Federation to give evidence upon any grievance they might have. As the South Shields Association had taken up the question very strongly, after discussion, on the motion of Mr. J. W. White, seconded by Mr. W. B. Cooper, it was resolved "That the South Shields Association be asked to appoint a witness to attend before the Departmental Committee."

The secretary's application for an allowance for office rent and expenses was considered, and after discussion, during which appreciative remarks were made in reference to his services on behalf of the Federation, it was unanimously resolved "That the Board of Representatives be recommended to increase the secretary's salary by £30, and that a grant of £30, be made to him for the current year."

The president made reference to the death of Mr. Henry Allison, senior partner in the firm of Messrs. Allison Bros., Middlesbrough, and moved a vote of condolence with his family; the members acquiesced by standing silently.

A communication had been received from the National Federation dealing with the conditions under which tenders are sent in, and asking for suggestions which would be considered at a conference between the National Federation and the Royal Institute of British Architects. The idea is that, if practicable, there should be an agreed form of tendering, just as there is an agreed form of contract. It was resolved "That a circular be drawn up and forwarded to each member asking for any suggestions for the regulation of the conditions under which tenders are required to be sent in."

It was decided to pay the subscription to the "Builders' Journal" for those individual members whose subscription amounted to more than one guinea.

Accounts amounting to £85 1s. 4d. were passed for payment.—W. H. Hope, solicitor, secretary, Post Office Chambers, 14, Norfolk Street, Sunderland.

BRISTOL ASSOCIATION.

Secretary: A. J. Pitt.

The ordinary monthly meeting of the Bristol Association was held on Thursday, October 28th, when Mr. Frank N. Cowlin presided over a rather small attendance of members.

The president, referring to the matter of publication of lists of tenders to unsuccessful competitors after the signing of the contract, stated that he had been unable to see the town clerk on the matter, owing to the illness of that gentleman. He had, however, put himself in touch with the city engineer, the city valuer, and the secretary to the Education Committee, in regard to this matter, and hoped to be able to report to the next meeting that the authorities concerned would fall in with the wishes of the members upon the question.

A letter was presented from the hon. secretary to the Bristol Society of Architects, stating that his society would be happy to meet the members of the Master Builders' Association to consider any matters which tend to maintain and strengthen the good relationship which exists in the carrying out of building works, and asking for an outline of the points for consideration, so that same might be brought forward at the next council meeting. Very careful consideration was given to this matter, and eventually it was decided to submit the following points:—Taking out own quantities, the £1,000 limit; tendering for time and money; attendance on other trades; list of tenders.

With reference to the first-mentioned subject, the president stated that London had agreed with the architects on a £500 limit, and, further, he had received a letter from the Bath Association, whose limit of value for tendering without quantities was £300, asking whether any alterations were contemplated in Bristol, as, if so, they hoped that efforts would be made to bring the rules of the two centres more into line. This he had duly acknowledged, intimating that the matter was receiving the attention of the members.

The sub-committee appointed at the last meeting to go into the question of the adoption by this association of a telephone card similar to that in use in certain other centres, presented their report, from which it appeared that they did not consider they could recommend the issuing of such a card bearing a resolution asking members to give preference, wherever possible, to firms whose names appeared on the card, as this might lead to some of the smaller firms becoming hon. members of the association in the anticipation of increased business, which might not be fulfilled. The idea of a telephone card for the use of members was, however, considered a good one, as it was convenient to have the numbers most in use compiled in a concise form, and accordingly the committee recommended that such a card be prepared, bearing the names of the members of the association, together with hon. members, and their telephone numbers. General details were left in the hands of the president.

A communication was read from the Operative Bricklayers' Society, complaining of the employment of specialists for pointing work, which they considered should be the work of those who had built the structure, and asking that the following should be included in the working rules:—"That pointing work shall be the work of trowel hands, and be done in conformity with the hours of labour, rates of pay, and all other rules as agreed between the Master Builders' Association and the operatives. When any job is ready for pointing, the required number for the work shall be selected from the trowel hands who have built the structure." Careful consideration was given to this request, but it was felt that the masters could not agree to the inclusion of such a rule, and it was decided to so inform the society.

WAKEFIELD AND DISTRICT ASSOCIATION.

The monthly meeting of the Wakefield and District Association was held at the Great Bull Hotel, Wakefield, on Thursday, November 4th. Mr. Tom Lee (president) was in the chair.

The minutes of the last meeting were read and confirmed, and the minutes of the meeting of the Yorkshire Federation Executive Council held at Selby on October 21, which had been attended by Mr. Lee (president), Alderman Judge, and Mr. G. Clements on behalf of the Association were also read and discussed.

The amended form of sub-contract, which had been forwarded by the Yorkshire Federation for consideration, was gone through, and certain suggested alterations and amendments were formulated for the consideration of the Executive Council.

On the motion of Mr. J. Pashley, seconded by Mr. H. Fallas, it was unanimously decided to send a cordial invitation to the Yorkshire Federation Council to hold their next meeting at the Great Bull Hotel, Wakefield, on November 18th.

Mr. Pashley also proposed, and Mr. Fallas seconded, the election of the President (Mr. Lee) and Mr. H. Gillott to audit the accounts of the Association for the current year, which are to be submitted to the annual meeting in December.

The nominations of the officers to be elected at the annual meeting for the ensuing year were submitted, and with regard to the presidency, it was unanimously decided to invite Councillor Spink to take that position.

During the meeting Mr. H. Fallas warmly thanked the members for the sympathy which had been extended towards him in his recent sad and severe bereavement.

BARNSLEY ASSOCIATION.

Secretary: J. Denton.

The monthly meeting of the Barnsley Builders' Federation was held at the King's Head Hotel, on Wednesday, November 10th, Councillor C. Haigh, president, occupying the chair, was supported my 23 members.

Important correspondence was dealt with, a copy of the amended builders' sub-contract agreement form and an urgent appeal by the secretary of the Yorkshire Federation with respect to overdue levies to the National Reserve Fund receiving special attention. A special levy has been made by the Barnsley Federation for contribution to the National Reserve Fund, and the treasurer promised to forward the amount due as quickly as possible. The copy of the amended builders' sub-contract agreement was submitted by the vice-president, but owing to the very important and far-reaching nature of the clauses contained therein, the general feeling was that a haphazard discussion would militate against the successful support and adoption by the Barnsley branch, a resolution being approved of for a special and careful discussion at the next monthly meeting. An unfortunate dispute between two prominent members with respect to an alleged unfair procedure in the letting of a certain sub-contract occupied the attention of the members for a great portion of the evening. The general feeting prevailing, however, was that whilst the member was fully justified in bringing his grievance before the meeting, yet it was thought that the grievance could easily have been disposed of satisfactorily to both parties, and an amicable settlement effected, without the intervention of the Federation, the whole case resting upon an unfortunate misunderstanding between a verbal and an official estimate. The election of officers for 1910, resulted as follows:—President, Mr. E. Broley; vice-president, Mr. C. D. Potter; junior vice-president, Mr. H. Ashworth; hon. treasurer, Mr. H. Ashworth (re-elected); hon. secretary, Mr. J. Denton (re-elected); auditors, Messrs. F. Goodyear and J. A. Binns; delegates to the Yorkshire Federation, etc., Messrs. E. Broley and C. D. Potter.

Copies of the "Builders' Journal" were handed round to non-subscribers during the evening with a view to inducing them to become subscribers.

NOTTINGHAM ASSOCIATION.

Secretary: W. J. Barton.

Nottingham Association has received a six months' notice for alteration of working rules from the Operative Bricklayers' Societies and the Builders' Labourers' Society.

A few particulars of the alterations suggested by the operatives will no doubt be of interest to other districts besides our own. The bricklayers are asking 10d. per hour, whereas the wage at present is 9d. per hour. They are also asking that the rate for night work where two gangs are employed shall be 1s. per hour. At present the rate in this case is subject to arrangement between the parties. As a set-off against the increased rate asked for, the workmen omit our present walking time rule entirely. This rule fixes the starting point at 1½ mile radius from the centre of the city except in one direction, where the radius is increased to two miles, and the radius to which these rules apply extends to four miles from the centre. Another clause asked for by the bricklayers is that in future only bricklayers shall be recognised as foremen over brickwork. The builders' labourers suggest 7½d. per hour against the present rate of 6½d., and they also introduce restrictions as to the number of bricks that a labourer shall carry. the present rule being 9 bricks all round till the walls of any buildings are 30ft. from the ground, and one brick less above that height, and they now ask that the rule shall read: "Labourers shall carry nine common bricks, eight facings, and eight blues," up to a height of 30ft., and one brick less above that height.

Another stipulation is "That brickwheeling to bricklayers is strictly prohibited." At present there is no restriction of this kind.

The labourers ask for 1½d. per hour additional for night work when two gangs are engaged, whereas the present rule is for ¾d. per hour extra. The labourers also omit any reference to walking time rule, which is on the same lines as that with the bricklayers.

In our leading columns, attention is drawn to the educative work which is being done by the Nottingham Association. Lectures on subjects of technical interest to builders have been given; and apprentices are being encouraged to study by the offer of prizes.

Coming Events.

Wednesday, November 24.

Architectural Association.—Conversazione, 18, Tufton Street, S.W., 8 p.m.

Manchester Society of Architects.—Mr. P. M. Oliver, B.A., on "Ancient Lights."

Thursday, November 25.

The Concrete Institute.—Royal United Service Institution, at 8 p.m. sharp. Mr. Richard L. Humphrey, M.Am.Soc.C.E., of Philadelphia (secretary to the American Joint Committee on Concrete and Reinforced Concrete), on "Some points relating to Reinforced Concrete as applied in America."

Friday, November 26.

The Architectural Association Debating Society.—Debate on "Open" Competitions (supported by Mr. K. Gammell) versus "Limited" Competitions (supported by Mr. W. G. Wilson).

Monday, November 29.

R.I.B.A.—Business Meeting.

Tuesday, November 30.

Manchester Society of Architects.—Students' Meeting. Mr. E. B. Norris on "Palladio of Vicenza and his School." Chairman: Professor Capper. 6.30 p.m.

Ancient Architecture Lectures at the British Museum.—Mr. Banister Fletcher's 9th paper, "The Parthenon, Athens," 4.30 p.m.

Monday, December 6.

Liverpool Architectural Society.—Mr. C. H. B. Quennell, F.R.I.B.A., on "The Development of Suburban Estates."

Tuesday, December 7.

Ancient Architecture Lectures at the British Museum.—Mr. Banister Fletcher's 10th paper, "Origin and Evolution of the Ionic Order," 4 p.m.

Institute of Sanitary Engineers.—Students' Meeting. Mr. A. J. Martin, M.Inst.C.E., on "Sewage Disposal," 7 p.m.

Wednesday, December 8.

Northern Architectural Association, Newcastle.—Council Meeting, 7 p.m. Ordinary Meeting: Mr. John W. Simpson, F.R.I.B.A., will read a paper, 7.30 p.m.

Royal Sanitary Institute, 90, Buckingham Palace Road, S.W.—Discussion on "The Collection and Disposal of House Refuse," opened by Mr. John S. Brodie, Borough Engineer, Blackpool, 8 p.m.

Manchester Society of Architects.—Mr. Henry Wilson on "Workmanship."

Friday, December 10.

Architectural Association.—Mr. F. C. Eden, on "Varallo, Orta, and Varese," 7.30 p.m.

Monday, December 13.

R.I.B.A.—Professor A. D. F. Hamlin, on "Architectural Education in America," 8 p.m.

Tuesday, December 14.

National Federation of Building Trade Employers.—Meeting of Administrative and Journal Committee.

Ancient Architecture Lectures at the British Museum.—Mr. Banister Fletcher's 11th paper, "Origin and Evolution of the Corinthian Order," 4.30 p.m.

Institute of Sanitary Engineers.—Students' Meeting. Mr. Geo. W. Chilvers, M.R.San.I., on "Practical Heating and Hot Water Supply to Buildings," 7 p.m.

The Trades' Training School, of 153, Great Titchfield Street, W. Presentation of prizes at the Carpenters' Hall, London Wall, by the Duke of Argyll, K.T., etc. 8 p.m.

Tuesday, December 21.

Ancient Architecture Lectures at the British Museum.—Mr. Banister Fletcher's 12th paper. Seventh and concluding lecture on "Greek Architecture." End of Michaelmas term. 4.30 p.m.

Trade and Craft.

Suggestions for Decoration.

A book that is no less useful than it is interesting, has been issued under the modest title of "A Few Suggestions for Ornamental Decoration in Painters' and Decorators' Work," by Messrs. Thos. Parsons and Sons, manufacturers of varnishes, japans, enamels, and fine colours, 8, Endell Street, Long Acre, London, W.C. The subject is approached from the historical standpoint, a bright and brief account of Long Acre one hundred years ago being accompanied by a series of very quaint little sketches of notable old buildings in the district, such at Hatchett's, Old Slaughter's Coffee-house, Old Drury Lane and Old Covent Garden Theatres, an unnamed but exceedingly picturesque Georgian tavern; and there are, besides, a sedan chair, a "Cupid after Stothard," etc. In this resort of artists the firm of Thos. Parsons and Sons sprang up as a natural product when George the Third was King. In those days, "few realised how much the studio in a narrow alley of Long Acre would influence the art of to-day: for there was the germ which was to develop later, after many vicissitudes, into the present Royal Academy, under the guidance of Chambers, Moser, Paul Sandby, and others." The firm, therefore, has flourished in an atmosphere of art, and has inherited stimulating traditions. The rest of the book consists of illustrations, many of them in colours, of various schemes and details of decoration. Many periods are represented, as well as most forms of decoration, even including the lettering and ornamentation of signboards, of which there are several handsome examples. The book is undoubtedly rich in suggestion, both as to its well-designed original schemes, which adhere very faithfully to the best traditions, and as to its well-chosen selection of examples of the work of the best periods. The architect as well as the decorator will be glad to possess it, because it gives, in handy and portable form, precisely the guidance of which they are often in need.

Penberthy Automatic Injectors.

Messrs. W. H. Willcox and Co., Ltd., of Southwark Street, London, S.E., have issued an illustrated list dealing fully with their Penberthy Automatic injector, which is for low, medium, and high pressures up to 200lb., and with their Auto-Positive injector, which is supplied for working on high steam pressures and for handling hot water. The Penberthy delivers water into a boiler at 160 degrees to 212 degrees Fahr., and is a "perfect restarting automatic machine"—that is to say, if the current of water be suddenly broken from any cause, such as a sudden jolt, as in the case of a traction engine or road roller, the injector will pick up the water and again establish the current to the boiler automatically, without the manipulation of a single valve or the least attention from an attendant. The Auto-Positive injector covers a wide range of service, but is specially suitable for compound road locomotives, steam road rollers, motor tractors, motor waggons and lorries, etc.

A New Stone Saw.

A recent development of the stone saw frame has been invented and put on the market by its inventor and patentee, Mr. Charles Landale, of Stores Road, Derby. It will cheapen the conversion of natural stone for building purposes; and now that there are so many cheap substitutes, it is more necessary than ever that quarry owners and builders should be possessed of up-to-date plant for quickly and economically converting stone to the required form. A number of users of saw frames, and representatives of the technical press, were present at an official trial of the machine, at Mr. George Graham's quarries, Crosland Moor, Huddersfield, when it was clearly demonstrated that a very considerable advance had been made. It was claimed, indeed, that the cost of sawing stone had been halved. In designing the machine the inventor's objective was to eliminate the defects of the existing type, more particularly the short stroke and quick revolution, with all its attendant vibration, and to substitute continuous cutting for intermittent. This he does in a very simple and ingenious manner, hanging the reciprocating frame by means of a parallel motion properly proportioned to guide the points of suspension in a curved path. By means of this arrangement the cutting blades are so guided as to keep the portion of blade which is in contact with the stone in a position tangential to a curve of large radius, this having the effect of raising each end alternately to allow abrading material to get below the blades. Stated shortly, this means obtaining a motion very similar to that of the hand sawyer. The trial consisted in cutting two blocks placed side by side on the machine, each with three blades—six blades in all. As the slabs to be cut were for an urgent order for stair landings, some of the hardest stone in the quarry had been selected. The cutting speed varied from 7½ins. to 7⅞ins. per hour, the average speed for the whole block being 7¾ins. per hour. To those unfamiliar with the conversion of Crosland Moor stone, this will convey little; but it may be said that had these same blocks been put on a screw-feed frame of recent design, having out-hung radius rods, the maximum speed of cutting would not have exceeded 3½ins. per hour. Such a frame as this was working during the trial on a much shorter block, and though using only two blades, at no time did the cutting speed exceed 4ins. per hour. When it is realised that the new frame takes no more power to drive than the old type, it is evident that a very considerable improvement has been obtained. In the opinion of those present, the cut faces left nothing to be desired. The most noticeable feature of the test, however, was the remarkable absence of shock and vibration.

Insurance.

Subscribers to "The Builders' Journal" are entitled to a Free Insurance for £500. Every subscriber should apply for this, sending a postcard with the name of the newsagent with whom the order has been placed. Subscribers can also obtain a General Accident and Sickness Insurance (the "Lighthouse" policy) at a reduced premium, which includes the Annual Subscription to this Journal. A pamphlet giving full particulars can be obtained free on application.

Free £500 Accident Insurance Coupons have this week been sent to the following:—

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	£	s.	d.
F. and H. F. Higgs, Herne Hill	£11,840	0	0
S. N. Soole and Son, Dunstable Works, Richmond	10,762	9	5
E. Triggs, The Chase, Clapham	10,368	10	0
C. F. Kearley, 4, Great Marlborough Street	10,337	0	0
W. Johnson and Co., Ltd., Wandsworth Common	10,304	0	0
J. and C. Bowyer, Ltd., Upper Norwood	10,293	0	0
J. and M. Partick,* Wandsworth	9,579	0	0

* Accepted.

London.—For enlargement of Essindine Road school, Paddington, for the London County Council.

	£
J. Smith and Sons, Ltd., Junction Works, South Norwood	£10,055
Waring and White (1906), Ltd., Cockspur Street	10,011
J. Garrett and Son, 83, Balham Hill	9,968
T. J. Hawkins and Co., 109, Victoria Street	9,664
Treasure and Son, Ltd., Cottenham Road, Holloway	9,661
G. E. Wallis and Sons, Ltd., Albemarle Street	9 626
W. Johnson and Co., Ltd., Wandsworth Common	9,612
Spencer, Santo and Co., Ltd., Kensington High Street	9,567
C. F. Kearley, 4, Great Marlborough Street	9,439
Patman and Fotheringham, Ltd., Park Street, Islington	9,385
H. Lovatt, Ltd., Wolverhampton	9,33[illegible]
J. and M. Patrick, Point Pleasant, Wandsworth	9,045
Hall Beddall and Co.,* Pitfield Wharf, Waterloo Bridge	9,049

* Accepted.

London.—For enlargement of school, Canonbury Road, Islington, for the London County Council.

	£	s.	d.
Treasure and Son, Ltd., Cottenham Road, Holloway	£9,755	0	0
McLaughlin and Harvey, Ltd., 13, Brecknock Road	9,407	10	4
Kirk and Randall, Woolwich	9,057	0	0
McCormick and Sons, Ltd., Northampton Street, Essex Road	8,959	0	0
Lole and Co.,* Trafalgar Square, Chelsea	8,519	0	0

*Accepted.

London.—For erection of school for physically defective children at Venetian Road, Norwood, for the London County Council.

	£
Rice and Son, 15, Stockwell Road	£5,586
G. Parker and Sons, 124, Sumner Road, Peckham	4,808
W. J. Mitchell and Son, Dulwich Village	4,785
W. Akers and Co., Ltd., 13, High Street, South Norwood	4,765
G. E. Wallis and Sons, Ltd., Albemarle Street	4,644
H. H. Hollingsworth, Batten's Yard, High Street, Peckham	4,594
W. Johnson and Co., Ltd., Wandsworth Common	4,571
J. and C. Bowyer, Ltd., Upper Norwood	4,531
E. Triggs, 92, The Chase, Clapham	4,529
J. Marsland and Sons, York Street, Walworth	4,510
J. Longley and Co., Crawley	4,426
J. Smith and Sons (Norwood), Ltd., South Norwood	4,322
J. and M. Patrick,* Point Pleasant, Wandsworth	4,206

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(Tenders continued on page viii.)

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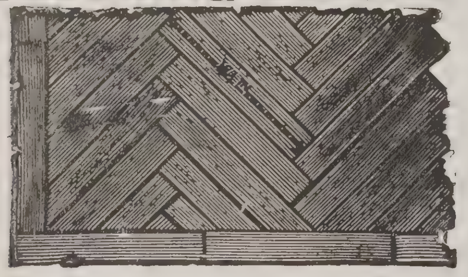

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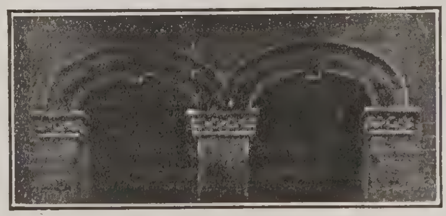

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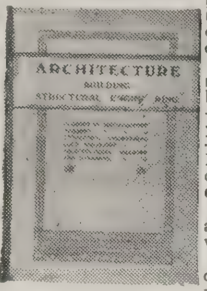

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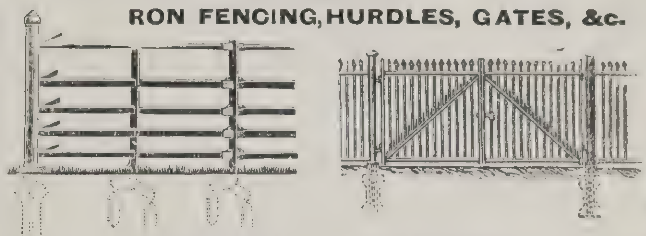

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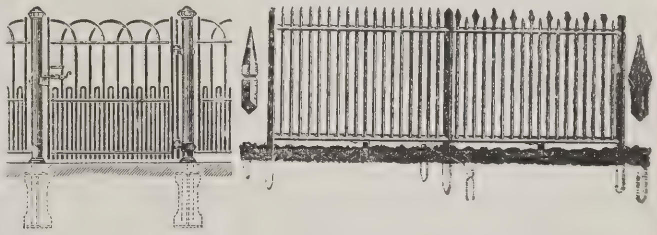

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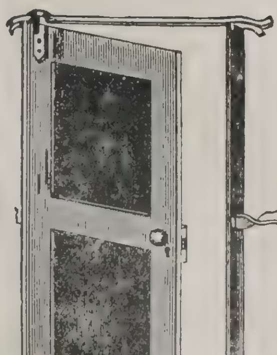

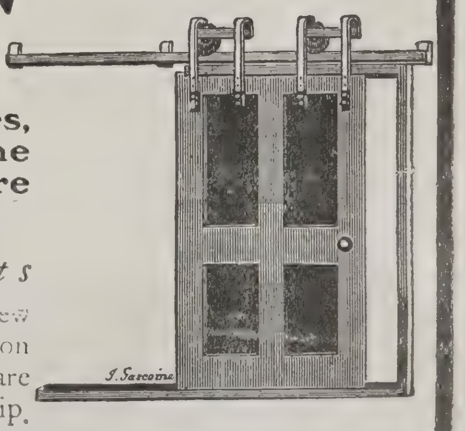

171, St. Pancras Road, London, N.W.

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(Tenders continued from page vi.)

London.—For completion of second portion of the Greenwich Generating Station, for the London County Council.

J. and C. Bowyer, Ltd., Upper Norwood, S.E.	£7,992
Kirk and Randall, Woolwich, S.E. ...	7,923
G. Munday and Sons, Eastcheap, E.C.	7,683
A. Roberts and Co., Ltd., Kensington, W.	7,577
Leslie and Co., Ltd., Kensington Square, W.	7,539
C. Wall, Ltd., Lloyd's Avenue, E.C.	7,531
H. L. Holloway, Deptford, S.E. ...	7,127
Holland and Hannen,* Bloomsbury, W.C.	6,827

Architect's estimate, £7,100.

*Recommended for acceptance.

London.—For enlargement of the Maryon Park school, Woolwich, for the London County Council.

Stapleton and Sons, 112, High Street, Stoke Newington	£6,401
J. Marsland and Sons, York Street, Walworth	5,567
F. and T. Thorne, Isle of Dogs ...	5'547
H. L. Holloway, Church Street, Deptford	5,471
T. D. Leng, Evelyn Street, Deptford	5,405
J. Appleby and Sons, Cornwall Works, Southwark Park	5,404
W. Harris, North Woolwich	5,401
Kirk and Randall,* Warren Lane Works, Woolwich	5,195

*Accepted.

London.—For erection of manual training, laundry, and housewifery centres at Berner Street school, St. George-in-the-East, for the London County Council.

Snewin Bros. and Co., High Road, Upper Clapton ...	£3,422	0	0
H. Kent, 31, Beacon Road, Hither Green	3,264	0	0
Perry and Co. (Bow), Ltd., Tredegar Works, Bow ...	3.257	0	0
Treasure and Son, Ltd., Cottenham Road, Upper Holloway ...	3,201	0	0
C. R. Price, 139, Bishopsgate Street Without	3,157	0	0
Newell and Lusty, 24. and 26, Wilson Street, Poplar ...	3,148	0	0
J. Chessum and Sons, 7a, South Place	3,141	19	6
Stevens and Sons, 1a, Yonge Park	3,095	0	0
G. E. Wallis and Sons, Ltd., 1, Albemarle Street	3,072	0	0
A. E. Symes, Stratford ...	3,044	0	0
W. Harris, North Woolwich ...	2,993	0	0
Kirk and Randall, Woolwich ...	2,980	0	0
F. and T. Thorne, Isle of Dogs	2,950	2	9
T. D. Leng, Evelyn Street, Deptford	2,944	0	0
J. and C. Bowyer,* Upper Norwood	2,866	0	0

*Accepted.

London.—For alterations to Mantle Road School, Deptford, for the London County Council.

H. H. Hollingsworth, High Street, Peckham	£1,981	0	0
F. Smith and Co., 15, Abchurch Lane	1,767	1	1
Holliday and Greenwood, Ltd., Brixton	1,732	0	0
J. and C. Bowyer, Ltd., Upper Norwood	1,673	0	0
W. Downs, Hampton Street, Walworth	1,668	0	0
J. Appleby and Sons, Cornwall Works, Southwark Park ...	1,667	0	0
G. Parker and Sons, 124, Sumner Road, Peckham	1,608	0	0
T. D. Leng, Evelyn Street, Deptford	1,574	0	0
F. and T. Thorne, Isle of Dogs	1,556	0	0
F. and G. Foster, Camden Works, Norwood Junction ...	1,548	0	0
J. Garrett and Son, 83, Balham Hill	1,496	0	0
A. E. Symes, Stratford ...	1,493	0	0
H. L. Holloway,* Church Street, Deptford	1,490	0	0

Architect's (Education) estimate, £1,605

*Recommended for acceptance.

London.—For enlargement of Amberley Road School, Paddington, for the London County Council.

J. Garrett and Son, 83, Balham Hill	£19,444	0	0
D. W. Davies, Morgan Chambers, Cardiff	19,337	0	0
Treasure and Son, Ltd., Cottenham Road, Holloway ...	18,533	0	0
W. Johnson and Co., Ltd., Wandsworth Common ...	18,361	0	0
Spencer, Santo and Co., Ltd., Kensington High Street ...	18,302	0	0
J. and M. Patrick, Point Pleasant, Wandsworth	18,131	0	0
T. J. Hawkins and Co., 109, Victoria Street	17,960	0	0
Patman and Fotheringham, Ltd., Park Street, Islington	17,891	0	0
H. Lovatt, Ltd., Wolverhampton	17,456	16	0
C. F. Kearley, 4, Great Marl-Borough Street	17,420	0	0
G. E. Wallis and Sons, Ltd., Albemarle Street	17,373	0	0
J. and C. Bowyer, Ltd.,* Upper Norwood	17,287	0	0

*Accepted.

London.—For erection of a home on the Wolfington Road, West Norwood, for the Committee of the Jews' Hospital, and Orphan Asylum. Messrs. Joseph and Smithem, architects. Quantities by Mr. Chas. W. Latter, 53, Doughty Street, W.C.

Trollope and Colls	£7,839
Cubitt and Co.	7,667
Hudson Bros.	7,359
Higgs and Hill, Ltd.	7,184
J. Greenwood, Ltd.	7,137
G. E. Wallis and Sons, Ltd. ...	7,132
Holliday and Greenwood	6,977
W. Moss and Sons, Ltd.	6,850
W. Lawrence	6,842
F. G. Minter*	6,700

*Accepted.

London.—For erection of a school on the Waldron Road, Wandsworth, site, for the London County Council.

Rice and Son, 15, Stockwell Road	£7,979	0	0
W. Smith and Son, Eldon Works, Harleyford Road ...	6,303	0	0
J. Carmichael, 331, Trinity Road, Wandsworth	6,178	0	0
Holloway Bros. (London), Ltd., Belvedere Road	6,154	0	0
Lole and Co., Trafalgar Square, Chelsea	6,056	12	0
J. Marsland and Sons, York Street, Walworth	5,974	0	0
W. Johnson and Co., Ltd., Wandsworth Common ...	5,933	0	0
W. Akers and Co., Ltd., 13, High Street, South Norwood	5,917	0	0
Garrett and Son, 83, Balham Hill	5,886	0	0
E. Triggs, 92, The Chase, Clapham	5,550	0	0
J. and M. Patrick,* Wandsworth	5,430	0	0

Architect's (Education) estimate, £6,036.

*Recommended for acceptance.

Nantwich.—Accepted for building a cottage hospital at Henhull, for the Nantwich Cottage Hospital Committee:—

J. Manley, Aston, Nantwich, £2,396.

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December 1, 1909. Volume 30, No. 773

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

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The Apprenticeship Question.

A conference on the apprenticeship question is to be held at the Mansion House, London, on December 3rd, under the presidency of the Lord Mayor. The conference has been convened by the London County Council, who, in the desire to make it fully representative, have invited to take part in it not only a number of leading experts, but also representatives of the Board of Trade, the Board of Education, the Charity Commission, the City Corporation, the City Parochial Foundation, the Chamber of Commerce, Borough Councils, apprenticeship charities, and unions of workmen and employers. The conference will have enough to consider. It is to discuss "the development of trade schools and industrial training, and in connection therewith (1) the administration of the apprenticeship charities of London; (2) the establishment or development of employment bureaux, or other means of bringing those leaving school into touch with the industrial and commercial world." There will therefore be either a very long sitting or a very superficial discussion, from which but little result can be anticipated beyond the possible appointment of a representative body to consider the subject with greater thoroughness and deliberation. The Lord Mayor is keenly interested in the subject, upon which he has already spoken in public, at a meeting of the Worshipful Company of Founders. He said that when he had urged upon employers the question of apprenticeship, some of them had pointed out that the living-in system could not be again revived, the conditions of trade having so greatly altered as to render impossible the old relationship between master and apprentice. The Lord Mayor thought that it would not be impossible to get an Act of Parliament compelling boys when leaving school to learn a trade. This proposition looks rather drastic; but, at the same time, it suggests the reflection that there is no reason why some of the compulsion that is so abundantly imposed on employers should not occasionally be directed towards the workers. Sir William Grantham, in homely and familiar phrase, hit the mark when he said that one of the great hindrances to apprenticeship was the desire of fond mothers "to see their sons put on a black coat." This is doubtless a prolific cause of the enormous surplusage of unskilled labour; and it must have a tendency to withhold from the ranks of skilled labour some of the brightest and most intelligent lads. This is an important point, because, while it must be sadly admitted that at the present time there is a superabundance of skilled labour of a sort, it is no less evident that workmen of really first-rate ability are exceedingly scarce; and the responsibility for this state of things is too confidently attributed to employers. As someone has very aptly said, "The best encouragement to employers to train more boys is to provide boys whom it is worth training." Owing to some defect either in our educational system or, as Sir William Grantham suggested, in our social outlook, this provision is by no means adequate. How to make it so is the problem that the conference has to consider; and builders, to whom the matter is of pressing importance, will no doubt have a powerful influence in shaping the course of a movement that, being so general—it seems to have come to a head spontaneously all over this country and France—encourages the hope that it may prove effectual. In the meantime, the account given on another page of the operations of the Apprenticeship Board, instituted some years ago by the Plumbers' Company, will be read with keen interest.

Our New Edition de Luxe.

The "Builder's Journal" Edition de Luxe, to be published on Friday, December 31st, 1909, price 1s. nett, will comprise about 300 pages, printed on art paper, and copiously and finely illustrated. Current British architecture will be illustrated with examples of recent work by leading architects of to-day; the general building events of the year will be usefully summarised; and an account will be given of what has been done during the year in the rapidly expanding domain of reinforced concrete construction. The chief feature of interest, however, will be the highly important section on Modern American Architecture. Only in this journal and in the "Architectural Review," which is issued from the same offices, has anything like an adequate account been attempted of the very remarkable development of architecture in the United States. The representative examples that we have illustrated have revealed in the most convincing way that American art and American construction are well worthy of the most earnest attention. We have been assured on all hands that the opportunities for studying it that we have been able to afford have been warmly appreciated, and many influential British architects have requested us to amplify the information already given. Accordingly, we have collected, in the extra number of the Journal, dated December 31st, 1909, the most complete account of American architecture that has yet appeared in this country. It is illustrated with about 150 examples of the most noteworthy work that has been done in the United States, and in the letterpress the evolution of American architecture is traced from the present time to its rise when America became a nation. As this extremely interesting account of the architecture of America, and of the men who have made it, is sure to be in great demand, readers are advised to make early application for the 1909 Edition de Luxe of the "Builders' Journal" containing it, similar issues having been immediately exhausted.

Mr. Balfour on Beauty.

Mr. Arthur Balfour's Romanes lecture, delivered last Friday in the Sheldonian Theatre at Oxford University, and fully reported in the "Times" of the following day, had for its title "Questionings on Criticism and Beauty." The title was only too apt, for the so-called "lecture" was unwritten, and was really a rather formless chat, which raised more questions than it settled; and it must have left his hearers in a more profound state of obfuscation than that in which it found them. For great indeed is the mystery of æsthetics; and neither by natural bent nor by training is Mr. Balfour inclined to clear and positive statement on any subject that will admit of "philosophic doubt." His re-statement of certain modern views, however, was sufficiently clear and definite, as when he remarked that "they would not find any competent modern critic, in a serious consideration of a picture, a poem, a statue, or a symphony, asking what end, outside the production of a beautiful work of art, it subserved. They would find him asking whether it was a beautiful work of art, and that was the only question with which, primarily, he was concerned." Then came one of his very searching questions: "If the feeling of beauty was the real point, whose feelings were they to take into account?" If he can be said to have attempted any kind of answer to this crucial question, it must be admitted that he did it in a characteristically cautious and non-committal way. "Always," he said, "there was a real hostility of feeling between the ideals of the new generation and those ideals which were the glory and the triumph of their immediate predecessors. If they went into any great Gothic building, due to the labour and the public spirit of successive generations, they would find every style mixed and combined. We admired the rather mixed result; but did our eclecticism represent the feelings of the architects and builders? He was convinced that nothing but considerations of time and money, overwhelming considerations in the Middle Ages as they are now, prevented the old work from being pulled down, and the whole fabric being built up according to the ideas of the architect of the day. He believed that an architect who lived during the time of the Middle Pointed or Later Decorated would as soon have built in an earlier school of Gothic work, as a self-respecting woman of the present day would consent to appear in the crinoline which was the universal female attire when he was a young man." Whence he deduced, somewhat obscurely, that "there really was no uniformity of standard to be got at by consulting the men of trained sensibility, especially if those men happened to belong to different ages and generations." This strikes one as being but little better than a laboured and turgid way of saying that fashions change; and the observation concerning the impatience of a new school with the works of an old would seem to have been prompted by a recent newspaper discussion on the casing of the columns of Canterbury Cathedral. It was a most enjoyable chat, very well worth reading as reported, since it represents what cultured people are thinking on subjects with which they are not very intimately acquainted; and their point of view is not without its value, because, after all, their views and notions on art react very strongly on the artist. We wish, however, that Mr. Balfour could have found time to write out his lecture; in which case it might not have been more luminous, but certainly would have been less loosely expressed than, for instance, in the passage about architecture, in which period and style are somewhat confused.

Contract Conditions. The "Form of Tender and General Conditions Relating to the Erection and Completion of Annexe and Sundry Alterations and Additions to Existing Buildings" for the Salford Town Hall, is a formidable document. It comprises nineteen foolscap pages of printed matter, and on almost every page there are items to which builders may reasonably object. The objections begin with the first effective clause, which happens to be clause 2, because clause 1 is occupied with the usual rigmarole of interpretation of such recondite terms as corporation, architect, and contractor. Clause 2, it is thought by the objectors, may be so construed that the contractor would find himself unable to charge for work that might happen to be omitted from the bill of quantities. This is possibly a strained construction; but, in view of some extremely arbitrary clauses that follow, builders may be well excused for apprehending the worst. Clause 3, for instance, provides that "Should any discrepancies appear between the bill of quantities and specification and the drawings, or should any misunderstanding arise as to the meaning or import thereof, or as to which of them should be followed, or about the quality or dimensions of the materials, or the due and proper execution of the works, or as to the measurement or quality and valuation of the works executed under the contract, or as extras thereupon, deductions therefrom, or as to any other matter or thing whatsoever arising out of the contract, or as extras thereupon, the same shall be explained and decided by the architect, and his explanation and decision shall be final and binding upon the contractor, and the contractor is to execute the work according to such explanation and decision, and without charge or deduction to or from the contract." Here, it is true, the contractor gets a sporting chance of doing less work than he might reckon on in preparing his tender; but on which side the probabilities lie it would be quite superfluous to say. The most objectionable feature of this clause, however, is that it makes the architect the final arbitrator, thus placing him in the invidious position of a contractual referee. Clause 4 goes a step farther in the same direction. It is so rich an example of audacity that we cannot forbear quoting it in full: "In the event of anything evidently necessary to the due and complete performance of the works (of which necessity the architect shall be the sole judge) being omitted to be shown in the drawings, or being omitted to be described in the bill of quantities and specification, through oversight or error or otherwise, the contractor is, notwithstanding, to execute in the most perfect and complete manner all such works as if they had been severally shown and described, without any extra claim or charge, according to the direction of the architect, and to his satisfaction." For frigid and calculated one-sidedness, that would be very hard to beat. The contractor who tamely assented to it would be justly credited with rather less business acumen than the original Simple Simon. Clause 14 is to much the same effect. Clause 5 throws upon the contractor the responsibility of making claims for extras before the work is done; otherwise, he can make no claim at all. Clause 9 generously holds the contractor responsible for the accuracy of the drawings and for the consequences of possible errors. The same lavishness of generosity is shown in kindly allowing the contractor to be responsible for any injury that may occur to Corporation employees during the carrying out of the contract. He is also, it would appear from clause 19, to be graciously permitted to lay on and supply at his own cost all the water required on the works, and he is to be held responsible for twelve months after the works are completed for damage to gas-pipes, water-pipes, electric cables, etc. The contractor is to guarantee the Corporation against all accidents, damages, claims, and losses of every description, although it seems that the quantities contain no provision for insurance—not even against fire. He is to be held responsible for delays caused by sub-contractors or manufacturers; and "all specialists, merchants, tradesmen, or others executing any work, or supplying any goods for which prime costs prices or provisional sums are included in the bill of quantities and specification, who may at any time be nominated, selected, or approved by the Corporation, are hereby declared to be sub-contractors employed by the contractor." The period of maintenance after the issue of the certificate of completion is to be twelve months. The architect shall have power to suspend the works "at this absolute discretion, and for any cause whatsoever," but the contractor shall not be entitled to any compensation for the delay; and the Corporation reserve to themselves the right to abandon at any time the whole or any part of the works without compensation to the contractor in respect of the abandoned works. This list by no means exhausts the beauties of the conditions, but we do not propose to go on with the dreary catalogue. Nor does it seem, for the moment, to be either necessary or desirable to comment severely on the points cited. They speak for themselves; and as we understand that the Corporation is to be approached with the object of getting them modified, we refrain from making remarks that might possibly embitter the negotiations. Nevertheless, we wish to make it quite clear that the day has gone by when contractors would meekly submit without a struggle to any conditions that a Corporation might see fit to impose. One of the objects for which builders have become federated is sturdy and effectual resistance to unfair treatment in the matter of contracts, and surely there can be but little doubt that, in the present instance, a firm, united, and temperate protest must prove successful. If there is any force in right and reason, a simple and lucid statement of the case should be sufficient to secure amelioration, and we shall be delighted to be able to report that the Corporation of Salford shall have been induced to act towards contractors in the true spirit of its excellent motto: "Integrity and Industry." In particular, we lay strong stress on the advisability—or, as we should prefer to put it, the just necessity—of adding an arbitration clause providing for the appointment of an independent referee in case of dispute; and we confidently assume that most architects are always very glad to obtain thus much relief from the onerous responsibility of exercising arbitrary powers.

Design in Reinforced Concrete. The lecture by Mr. Richard L. Humphrey, at the Concrete Institute meeting, was particularly instructive, both as regards its matter and the illustrations in the form of lantern slides. By means of the latter, Mr. Humphrey was enabled to show a number of views of buildings in concrete and reinforced concrete, designed by American architects, and to give some idea of the trend of architectural design in what the lecturer termed this "plastic" material. Judging from the views of farm buildings, houses, etc., shown on the screen, our American confreres have not, as yet, made very much progress in the matter of reinforced concrete design, although they are less hampered in the use of the new form of construction than are the architects in England. Indeed, Mr. Humphrey admitted, in the course of his explanatory statements on these slides, that the initial efforts of the architects had not been very satisfactory; but he took the opportunity of pointing out one or two of the buildings shown as well designed. With due deference to so eminent an engineer, we take leave to say that not one of the buildings shown could be regarded as really expressive of the material. A skyscraper store, and a fine country mansion in the Renaissance style, shown by Mr. Humphrey, might, so far as appearance goes, have been built in stone; and as regards the latter example, every care seemed to have been taken to copy the effect of stone columns and coursed ashlar work. The engineering designs were by far the most satisfactory of all those shown, chiefly because no attempt had been made to imitate any other material, and the essential problem of the design had been met in the simplest and most effective manner. One of the most interesting statements made by Mr. Humphrey concerned the polishing of concrete. He confessed that he had not thought it possible; but during his recent visit to Austria he had seen concrete polished, with a surface as fine as that obtained on marble.

Architects of the Day.

VIII.—Jean-Louis Pascal, Membre de l'Institut de France.

It is an essential characteristic of every leader of men to possess a personality which inspires and retains the confidence of those who come under his influence. Such personality expressing as it does a peculiar combination of the best elements of character, added to the ordinary skilful performance of his duties, is often all that is necessary to a considerable measure of success in many an undertaking; but to attain great success and retain it over a period of many years in certain professions, especially in such as teaching art—of which the most important part is the indefinable—requires not only confidence in the man and his opinions, but that he shall possess that rare charm which wins devotion and gains the affection of his followers. Especially is this true when that leadership in his profession is recognised not only by virtue of his accomplished works but by what is practically a kind of ballot—by the number and successes of those men who seek and profit by his instruction—his pupils —or who desire his judgment upon their works, who elect him judge or juror to decide between them in competitions and for honours at the exhibitions; and it is in this way that leadership among architects is recognised by our confrères in France. That Monsieur Pascal is, and has been for many years, recognised among the ablest architects of to-day, not only in his own country, but wherever architecture is understood or practised, is too widely known to require our statement of the fact; but the important incidents and details of his long, valuable, and brilliant career, which are less known than they should be, can hardly fail to be of interest to those many British architects who have become acquainted with only his name or his more important works.

The subject of this sketch, Jean-Louis Pascal, was born in Paris the fourth of June, 1837, and at about the age of sixteen years became a pupil of Gilbert, and entered the Ecole des Beaux-Arts a year later. He almost immediately distinguished himself as an artist by winning the second and, the following year, the first *prix Rougeoin*—the latter design, still being regarded as one of the most brilliant decorative essays the prize has drawn forth. He gained the *prix* Abel Blouet, and many other student honours, including the *Grande médaille d'émulation* and a *Prix Départmental*, and at the age of twenty-two years won for the first time (1859) the second *Grand Prix de Rome.* This was the year that Boittee gained the *premier prix*, and the first of a series of competitions for this coveted prize, when the *logists* (the competitors) chosen for the final struggle after the series of examinations, which reduce the number of aspirants from several hundreds to ten; these make their final drawings in a *loge*—small room—at the *Ecole*, and are thenceforward known as *logists*, which is a considerable student honour), when the *logists*, for a period of eight or nine years, were all artists of more than the ordinary calibre of these *concurrents*, nearly all having subsequently gained the *Grand Prix* and eminence in his profession. The list of "*Grand Prix*" includes Boitte 1859, Moyaux 1861, Chabrol 1862, Guadet 1864, Pascal 1866, and Bénard 1867. Among these, Pascal became prominent for several reasons; he gained a *loge* seven times, and second *Grand Prix* twice (a unique distinction), and finally the *Grand Prix* itself, with the most remarkable artistic composition that has yet been produced in all the great competitions for this prize.

In all previous competitions the condition of site had been such as to allow a simple symmetrical plan, and absolute symmetry had been a *sine qua non.* It was upon designs for absolute impossible buildings for France of that time, or even for the United States at the present, that the great abilities of Garnier, Ginain, Bonnet, Vaudremer, Moyaux and Guadet, had been made apparent. Each had produced a brilliant classical composition, and it seemed as though the last word in such design had been given in Moyaux' masterly plan for an "Etablissment de Bains dans une ville d'eaux thermales," which won the *grande timbale* in '61. But the programme of the year 1866, gave an irregular site with conditions such as are met in actual practise, and for which the classical monuments of neither Greece nor Rome afford much inspiration. The building, too, was within the bounds of possibility, not to say probability. The solution demanded above all things invention, and put it to the *logists* to prove that they could produce a modern group of buildings fit to rank with the great classical works. The result produced an entirely new type of design, in which almost every difficulty met with in complicated planning is found handled with a mastery rarely achieved save in the later works of those architects of bygone days, who we call the "great masters." To realise its greatness one needs compare it with the plans by Batigny and Bénard (the winner of the University of California competition), which were placed second and third respectively, and either of which seen by itself is a wonderful piece of work, but is quite outclassed by this extraordinary design by Pascal.

One can with difficulty give an idea of the labour and energy which must be deployed to gain a *loge* seven times, and triumph over the numerous competitors who present themselves for these examinations. The diversity of the programmes requires an uncommon subtlety of talent, and innumerable resources of imagination. The Grand Prix de Rome is, as everyone knows, the highest "recompense" awarded to architects, as it is also to painters, sculptors, engravers, and musicians—by the French Government.

The same year he obtained at the Salon of 1866 a medal for a study for a Legislative Building in Holland. During the five previous years he had worked as the trusted and intelligent collaborator of Charles Garnier upon the design for the Grand Opera, and his name is inseparable from that of the great designer of the *Academie Nationale de Musique*. One sees in his *Grand-Prix* design that he knew how to bring forward in his student work the knowledge gained in practical experience. And the fact of con-

Photo. Eugene Pirou

MR. JEAN-LOUIS PASCAL, MEMBRE DE L'INSTITUT DE FRANCE, OF PARIS.

tinuing to enter the competitions at the Ecole after commencing upon actual architecture is enough to prove an extraordinary capacity for work; but this is further demonstrated by the beautiful sets of drawings of restorations of antique monuments which he sent back to Paris every year during his stay in Italy and Greece, which obtained the highest commendations of the *Academie des Beaux-Arts*. At Rome he designed the monument erected there, in the French Church of St. Louis, in memory of Colonel d'Argy.

After the war he became Auditor to the "Conseil Général des Bâtiments Civils," and was then chosen by the celebrated architect, Lefuel, to become Inspector of Works upon the completion of the Louvre, where he remained thus occupied for several years.

In 1872 he designed the exquisite monument to Henri Règnault, in collaboration with Coquart, Chapu, and Degeorges (sculptors), which stands under the arcade in the Cour de Murier of the Ecole des Beaux-Arts. The same year he submitted a design, which was premiated in competition for the Hotel de Ville, Paris, and the following year won a medal at the Vienna Exposition. He also received the Lheureux prize, given by the City of Paris.

In 1874 he entered a design which was awarded a prize in the competition for the Church of the Sacré-Cœur, at Montmartre, and succeeded his former master, Questel, as Chief of the Atelier, now known by his name, but which is in full: *Atelier Blouet-Gilbert-Questel-Pascal*. He was made the successor of Henri Labrouste as architect of the National Library (Paris) in 1875, and also Diocesan Architect of the Drôme. In his work upon the new wing of the library he proved himself worthy to succeed Labrouste, especially in his reconstruction of the façade in the Rue Colbert, than which there is no work in modern Paris more charmingly designed or more delicately detailed.

He won in competition in 1876 the *Faculté mixte de Médicine et de Pharmacie* at Bordeaux, an important work which occupied most of his time during the next two years.

At the Universal Exposition of 1878 he designed the Portuguese National and Colonial Palace, which scored him another success—a medal of the first class and the decoration of the Cross of Portugal.

The same year he was made a member of the Jury of the Ecole des Beaux-Arts, and in 1880 received the decoration of the Cross of Chevalier of the Légion d'honneur.

If now we mention the Monument to Michelet in the cemetery of Père-Lachaise, designed in collaboration with Mercié (sculptor), the monuments to President Carnot at Bordeaux, and of Victor Hugo, in collaboration with the sculptor Barrias, and of Charles Garnier at Paris, and the decoration of the *Chapelle de la Rochelle*, in collaboration with Bouguereau (painter), we shall have mentioned the most of his purely artistic work; always dearest to the heart of the French architect.

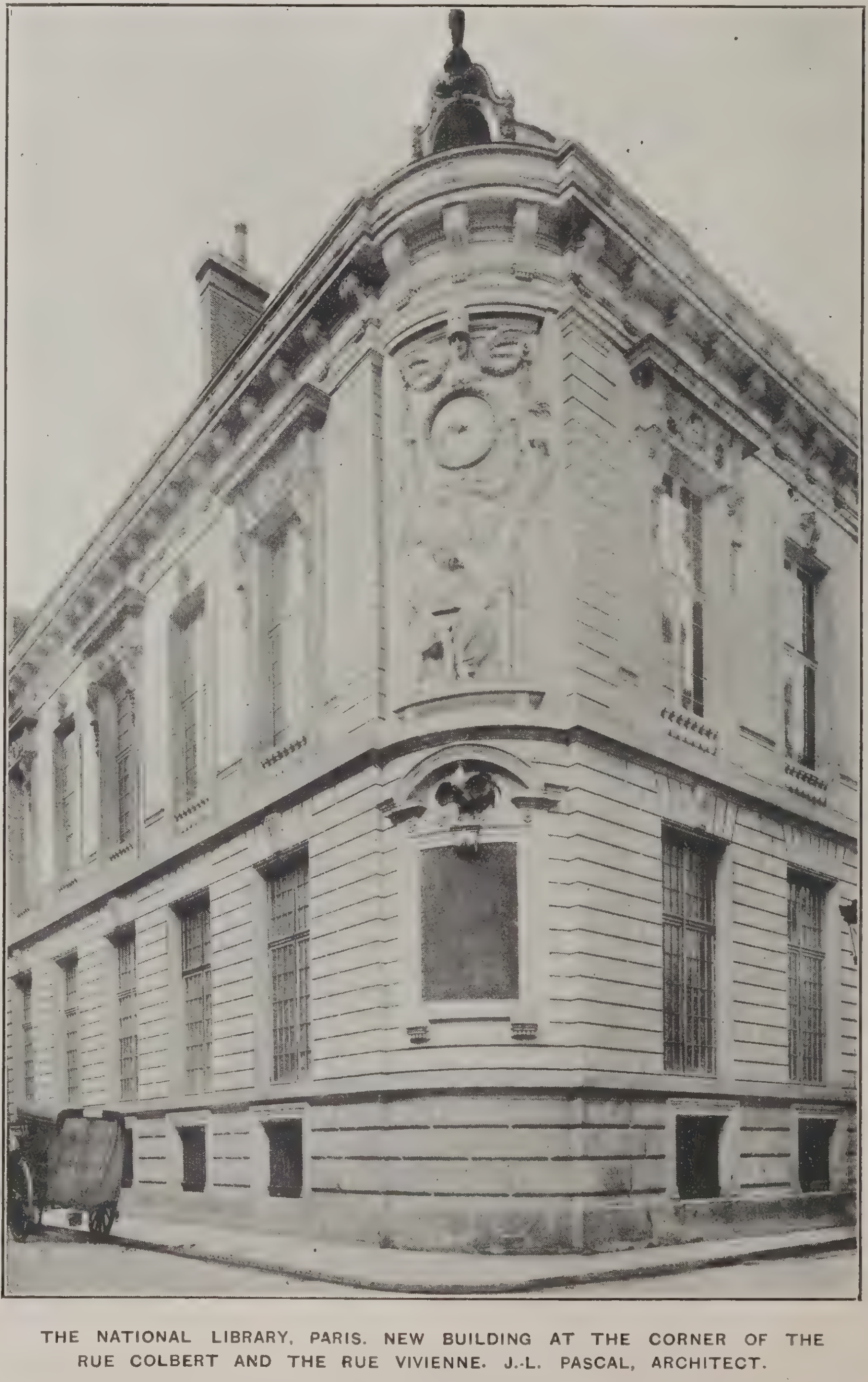
But there is a long list of work of greater magnitude and, aside from the artist's point of view, of greater interest—which has made up the bulk of the life's work of Mr. Pascal. Among these we may place in the first rank the *Mairie* and a group of schools at Ablon, the transformation of the old Italian theatre into a branch of the Banque de France. The town house of the painter Bouguereau at 75, rue Notre Dame-des-Champs, which was one of his earliest works, the house of the engraver Jacquet at the Isle-Adam, that of M. Renouard at Pau, the Château and dépendances de Doux near d'Aurillac the town house of the painter Perrault at 45, Boulevard Flandrin, the transformation of a part of the Palais Royal into a town house for M. Blanchet. Also the beautiful apartment house at 197, Boulevard Saint-Germain, and the Kœnigswarter house at 12, rue de Prony. One of his more recent works, the Château de Maubuisson at Clairfontaine, near Rambouillet, is shown by the illustrations. An indefatigable worker, he is at present busy—at the age of seventy-two years!—with the construction of the Faculté de Pharmacie, which is being added to the Faculté de Médecine at Bordeaux, constructed by him in 1876.

This incomplete list includes many of the best specimens of architecture of our epoch, but as many of them are known to everyone, it will not be necessary to dwell upon them here. Besides this private practise and the public offices filled and mentioned above, he has performed important functions as architect of the diocese of Valence, of Avignon, and the Vancluse. In 1880 he became a member of the National Conseil Général des Batiments, of which he is at the present time Inspector-general and Vice-president.

In 1887 he was made a member of the Academy, in 1889 promoted Officer of the Légion d'honneur and also chosen a member and reporter of the Jury of the Section of Architecture of the Universal Exposition, following which he was created an Officer of Public Instruction. In May, 1890, he was elected a Membre de l'Institut (Académie des Beaux-Arts), in succession to Jules André, and in 1903 Commander of the Legion d'Honneur. He has served as member of the jury of innumerable competitions, salons, and exhibitions, with which his lucid, concise statements, coupled with his unfailing perception and judgment, have borne great weight. As Inspector-general of Civil buildings (4th division), Mr. Pascal is entrusted with the supervision and care of the following public monuments:—The Observatory, the Grand Opera, the Pantheon, and the Grand Palais de Champs-Elysées at Paris; the *Chateau de Pau*, the *faculté de medicine et de pharmacie* at Montpelier; the *Ecole veterinaire* at Toulouse, and the Institution of Deaf Mutes at Bordeaux.

His sense of the refined and delicate in art is as extraordinary as his great *finesse* in the knowledge of it. Pascal belongs to the great race of architects, whose works reflect the joyous and glorious side of the world's history—it is thoughtful, pleasing—in a word, *refined*; and all good architecture is autobiography!

The life-story of every French architect, at least of those trained at the National



THE NATIONAL LIBRARY, PARIS. NEW BUILDING AT THE CORNER OF THE RUE COLBERT AND THE RUE VIVIENNE. J.-L. PASCAL, ARCHITECT.

School of fine arts, begins with his master's teacher and terminates—probably?—with his youngest pupil's last pupil; but for the purposes of this article it will be sufficient to mention only that Mr. Pascal was a pupil of Gilbert, and after the death of Gilbert of Questel, who succeeded him, and that he presides over the atelier in which he studied forty-three years and more ago; and among his pupils a few of the more distinguished are Henri Paul Nénot, architect of the Sorbonne, Grand Prix de Rome, 1877; John J. Burnet, of Glasgow, architect of the extensions to the British Museum, Désiré Despradelles, twice classed first for the *Grand Prix*, and twice the victim of adverse circumstances, winner of first, *second Prix de Rome*, and of third place in the competition for the University of California, architect of the Boston General Hospital, and Professor of Architecture in the Massachusetts Institute of Technology; Charles Mewès and Arthur Davis (whose work was reviewed in the first article of this series), architects of the Ritz Hotel, "Morning Post" building, and the Automobile Club, London; Frank Simon, of Liverpool, joint architect of the Liverpool Cotton Exchange; Professor Paul Cret, University of Pennsylvania; Cassièn-Bernard, Courtois-Suffit, Recoura, Duquesne, and Debat.

As to the record of his atelier, during the past seventeen years there have been but four when one of his pupils did not gain either the *Grand Prix* or one of the two second *Prix de Rome*, as will be seen by the following list of pupils, gaining one of these prizes and the prize achieved:—1893, second, Second Prix, Alfred Recoura; 1894, *Grand Prix*, Alfred Recoura; 1895, first Second Prix, Edouard Duquesne; 1896, *Grand Prix*, Louis Pille; 1897, *Grand Prix*, Edouard Duquesne; 1898, second Second Prix, Auburtin; 1899, ——, 1900, first Second Prix, J. Bernard; 1901, second Second Prix, Barrias; 1902, first Second Prix, Eugene Coutan; 1903, second Second Prix, Joulie; 1904, first Second Prix, Henri Tauzin; 1905, 1906, ——; 1907, second Second Prix, Charles Boussois; 1908, *Grand Prix*, Charles Boussois.

Among his earlier pupils gaining one or another of the *Prix de Rome* are Breasson 1875, Cassien-Bernard 1876, Nenot 1877, Courtois-Suffit 1882, Quatesons 1883, Heubes 1877, Despradelles 1889, and Bossis 1890. The *Prix Achille Leclere* has been won by his pupils eight times since 1895, and of the *Prix Chenavard*, nine since that year.

His pupils have come from all parts of the world, but especially from England and the United States, one great advantage to his English-speaking pupils being that he not infrequently gives them the benefit of his kindly criticism in their own tongue, which he speaks fluently. To all he is affectionately known as *Père Pascal*—in fact, to many of the students who have never been his pupils! As a striking testimony of this spirit of affectionate loyalty and friendship his former pupils memorialised the twenty-fifth anniversary of his adoption by the atelier—for it must be remembered that the atelier chooses its own master—by having a medal struck in his honour and presented to him. Chaplain, the greatest of engravers of medals made the design, and in it this sympathetic artist quickly caught the sentiment of the pupils; on the obverse it bears a profile portrait of M. Pascal; on the reverse there is a strong luxuriant tree under the protecting boughs of which are springing up young shoots, which are beginning to put forth foliage.

To-day, he still attends scrupulously to business, and the interests of his students—of which he always has from fifty to one hundred—a large task for even a man in his prime, and is as active and alert mentally as in the days when he worked for the *Grand Prix*, and assisted Garnier on the Opéra, and still found time to make more than a slight reputation as a writer of magazine articles, and to become a mathematician of conspicuous ability. He is an entertaining and delightful conversationalist, and a charming and witty after-dinner speaker.

Something of the force of his logic and clarity of expression may be gleaned from the following letter written about ten years ago to a young American architect (the italics are our own):—

"*The time has passed when contemporary civilisations ignore even their nearest neighbours.* There are no materials, no inventions, no new processes of one country that are not immediately known over all the world and employed everywhere. These two factors of the renaissance in art prevent us all, you as well as us, from creating significant forms, or a so-called new style, which will not be a growth, a development; one epoch simply in the upward and continuous evolution of architecture. *More and more will architecture become universal—there will be little beside the conditions of climate and material which will make diversity*—unless there becomes a religious evolution, and that is hardly to be looked for in this century of tolerance.

"It is necessary to glance at your side. Having at the first step reached the culminating point of all civilisation, *having had no childhood apart from ours, your composite country can offer no solutions, which are not the consequences of our past conquests, which are yours now, as well as ours.*

"Certain problems, whose different terms open the possibility of new discoveries, might furnish starting-points for interesting combinations; but just as your discoveries in science, in literature, in military, and in all the branches of human attainment tend more and more to make uniform the march of progress, just as the easy communication suppresses more and more the local characteristics which constitute the physiognomy of all people, and by bringing together gives to them the atmosphere of the provinces, and to the provinces the individuality of cities and villages, *so architecture from day to day will tend more towards uniformity in future solutions.* This consequence, this extension of civilisation, will prove a great blow to artists. It has taken us centuries to lose our native originality, which makes the differences and peculiarities of diverse styles synonymous with differences in beauty; but it has taken us as much time to attain that proficiency, which means to a certain extent the negation of originality, while it is the greatest security to the *art of composition.*

"*Like us, you are now condemned for not giving proof of innocence,* for not cultivating your art, for not refining your tastes, and not cherishing your architecture as much, and more, in the conception of plans, as in the arrangement of façades.

"Having attained your majority at the start, we can only wish reciprocally that each of us may reach old age as late as possible, to uphold each other in the strength of our maturity, for decrepitude and death alone can produce from decay and ruin that renaissance of which all generations have dreamt, and which is the flower of the grave.

"There is no sadness in this thought! The highway is long, and, above all, it is broad, and we may all walk in it—probably in uniform step—at any rate, free and powerful in that vast clearing which replaces the charming footpaths in which our fathers lingered."

At a meeting of the Lord Justice FitzGibbon Memorial Committee in Dublin recently, it was decided that, subject to the approval of the Cathedral authorities, the memorial be a statue in St. Patrick's Cathedral, Dublin.

* * *

By the unfortunate collapse of a house in Cumberland Street, Dublin, two lives were lost. The house, which was let in tenements, had been in a dangerous condition, and Mr. Gately, a contractor, and a labourer named Leonard, were engaged in making the necessary repairs when the back of the house, which was forty feet high, collapsed, and both men were buried in the ruins. There were six families residing in the house, but they reached the street in safety.

AN ARCHITECT'S VIEW OF QUANTITY SURVEYING.

At a meeting of the Quantity Surveyors' Association, held at Caxton Hall on November 10th, Mr. H. T. A. Chidgey (president), in the chair, said: We are to be favoured tonight with a paper to be read by Mr. Wm. Woodward, a very well-known gentleman in the City of London, who has been in practice for a great many years, and who will tell us something on a subject with which he is well qualified to deal. His paper is entitled "Quantities and the Quantity Surveyor, from an architect's point of view." That is a point of view which all quantity surveyors are anxious to know of. We very highly appreciate the architect's point of view. Mr. Woodward will tell us something which will be extremely interesting and of practical value, and I need not waste your time or his by introducing him at longer length to a meeting of quantity surveyors in London. I will ask him at once to be good enough to read his paper.

QUANTITIES AND THE QUANTITY SURVEYOR, FROM AN ARCHITECT'S POINT OF VIEW.

Having in my earlier years had some little experience in taking out quantities, and, in my later years, had the good fortune only to employ quantity surveyors, perhaps the knowledge gained in an active professional life of over 40 years may have resulted in the gathering together of a few thoughts, the delivery of which may lead to a lively discussion which will be of some advantage to architects as well as quantity surveyors.

Why Architects Should Not Supply Their Own Quantities.

As recently as February, 1906, Mr. H. J. Leaning read a paper at the Surveyors' Institution on "The Assimilation of the Practice of Quantity Surveyors," and in that paper he made a statement which I most strongly endorse, viz., that "there are a number of powerful reasons why the architect should not supply quantities for his own works, perhaps the strongest being that it tends to subvert that impartial treatment of the building owner and the contractor which should be the architect's leading principle, and which (as experience shows) is often seriously impaired by his assuming the position of quantity surveyor," and I should like to add to that the strong objection there is to architects employing men in their own offices, at a salary, to take out the quantities for works in hand. I have heard of cases even where architects have allowed these assistants to place their names at the bottom of the endorsement on the bills of quantities, with the obvious intention to convey to outsiders the idea that the quantities were prepared by an independent surveyor. If men make up their minds to indulge in the joint practice of architects and quantity surveyors, they should not be afraid to make the fact clear to clients and to contractors. I understand that in the provinces the custom of architects taking out their own quantities is more prevalent, and is better known to employers and contractors, and perhaps less objection to the system could be urged as regards the provinces than would be the case in London.

Standardisation of Quantities.

One subject in Mr. Leaning's paper opened the door to an important alteration in the method of taking out quantities, and, if followed up, would, I think, have led to the practical extinction of many quantity surveyors, and to the levelling down of the profession generally. The subject referred to was the "Standardization" of bills of quantities. Personally, I can conceive nothing which could be more injurious to the profession—nothing more calculated to lower the educational status of surveyors than any such system. Bills of quantities, as was mentioned at the time, would become simply a series of lithographed "forms" to be filled in by Dick, Tom and Harry, and would at once considerably enlarge the already too large number of men who term themselves quantity surveyors, and at the same time reduce the number of first-class men who have devoted so much time and labour in acquiring a thorough knowledge of their business. I have not heard anything further of this suggested "Standardization," and I feel sure that you will agree with me in the hope that we never shall.

A Position of Trust.

A quantity surveyor occupies a very important position of trust. The architect relies upon him to include in his bills neither more nor less than is proper and fair; the builder relies upon him to do the same thing; and, in the measurement and valuation of variations on the contract, the surveyor must not deviate from the obligations and duty which are cast upon him to see that the client is paying for nothing that he has not got, and that the builder has provided nothing that he has not been paid for. The architect, who knows perhaps very little of what has been taken in the bills, looks to the surveyor to see that every omission has been accounted for, and the builder that every addition has found its place in the final accounts.

Keeping Pace with the Times.

The quantity surveyor's knowledge has to keep pace with the times. The practitioner who vacated this sublunary abode 50 years ago would be astonished if a Chicago "Julia" rung him up and related the alterations and inventions in building construction which are now in vogue—terra-cotta; reinforced concrete, steel framework construction; patent floors; patent partitions; elaborate sanitary plumbing and fittings; and all the paraphernalia attaching to American, French, and English inventive genius which the modern quantity surveyor has to make himself acquainted with in order to prepare a proper bill for the purpose of a modern tender.

Provisional Sums.

In some cases these difficulties are met by the insertion in the bills of large provisional sums for specialists in this, that, or the other trade, and these provisional amounts form, at times, a very large percentage of the contract sum, and the specialist's work a very large proportion of that undertaken by the general contractor. The longer I live, the more I am convinced that the less there is in a job of the sub-contractors and specialists the better it is for the job generally, and for the contractor in particular.

Shortening the Bills.

There is another matter connected with being up-to-date, which I suppose must be, if it is not already being dealt with, and that is the shortening of the bills. Clients now want their buildings erected and fit for occupation in about the same time as used to be expended in making the drawings and writing the specification. In my early days all the drawings were carefully thought out, and inked in; the scale, and full-size details all equally carefully thought out and inked in; the specification written in complete detail and fair-copied, and then the whole handed to the quantity surveyor, who occupied, perhaps, many months in perfecting a document from which nothing was left out. Page after page of labour to groove,; ditto to rebate, etc., etc.; and then ditto, ditto, ditto, but "cross-grain." In the days of 50 or 60 years back machinery in the builders' shops was in its infancy, if not entirely unknown. And not only in the joiners' and carpenters' shops, but in the contractor's stone yard and at the quarries. A large amount of stone is now worked at the quarries, and sent direct to the job ready for setting, and the labours on woodwork have been reduced, as regards cost, by machinery, to such an extent that I should say much of the quantity surveyor's work could be correspondingly reduced without disadvantage from his point of view, or from that of the client and builder. I am quite aware that it is extremely difficult to know where to draw the line in this shortening of work; I have been told, when I have complained of what I considered the inordinate length to which some bills had been carried, that whatever labour or work the builder had to do, that work should be set forth in detail in the quantities. That may be, and is no doubt quite true, but, notwithstanding, I think it is a matter worthy of the attention of the surveyor as to whether or not some substantial shortening of the bills as regards carpenters' and joiners' labours might not with advantage to all concerned be effected. I know that as regards labors on Masonry many surveyors do not now take them off, but they do what to my mind is quite as good from the estimator's point of view, and that is to split up well in the bills the various classes of stonework, and attach sketches showing the labors on these various classes of work. It is said on the other hand that the taking off of all labors is essential to enable the estimator accurately to judge of the value of the foot cube, and no doubt I shall hear, tonight, the opinions on the two ways entertained by surveyors themselves.

Methods of Preparing Tenders.

Another question arises as to methods of preparing tenders in lieu of the complete bill before the tender is accepted, and the system adopted, I believe, to a large extent in Scotland, is to obtain tenders on a schedule of prices, the actual work being measured thereafter, on the job, and priced in accordance with the schedule. That, no doubt, is an expeditious mode of obtaining tenders, but I do not think it would work so well in London, where architects and clients want to know exactly what a job is going to cost before the tender is accepted. By this method I believe the custom is to prepare a blank bill of quantities representing as near as possible what work will be required in the particular job, and the builder puts his prices to each item, the main absent part being the quantity of work required.

Then there is the method of obtaining tenders adopted by certain Government Departments, viz., to issue schedules of works required, with prices attached, the builder tendering on so much percentage above or below the prices affixed by the department. Perhaps we shall ascertain to-night what quantity surveyors think of these methods of obtaining tenders.

Quantities as Part of the Contract.

The question as to whether or not quantities should be made part of the contract has occupied for many years past the attention of all concerned in building operations. Personally there has never been a doubt in my mind as to the right system, and that is to make the quantities, in every case, part of the contract. I should not desire that through a mere clerical error my client obtained something for nothing, or that a builder succeeded in being paid for materials and labour which he never executed, simply because a clerk put down tons instead of cwts., or brought his brickwork into rods reduced before he had turned his 9in. work into 14in. work. It has been said by some surveyors, quite qualified to judge, that if the system I have above advocated were universally adopted, it would lead to slovenliness on the part of surveyors, but I do not think so. I believe that the respectable surveyor would be quite as careful in his work whether the quantities were, or were not, to be made part of the contract. I have, myself, always adopted the method of making quantities part of the contract, and unless you, gentlemen, urge good reasons for the contrary method, I shall go on in the same old way.

Legal Responsibility.

We might now consider for a few minutes the legal responsibility of the quantity surveyor, and I am not sure that in the case of an error on his part, either the builder or the client could sustain an action-at-law to recover the value of the error. I have not been able to look up recent decisions on this point, but I remember that a case was decided many years ago as to responsibility for payment of the quantity surveyor's fees, and that directly the contract was signed the responsibility for the fees shifted from the client to the contractor. On the point, however, of liability for payment for errors, I assume that unless negligence could be proved against the surveyor it would be difficult to recover damages. And I think this should be so; the idea of getting out of a surveyor, say, £500, for an error on a job for which his total commission may be £50, does not commend itself to me.

If he has overstated his quantities, the builder must give way; and if understated, the client must give way; and, of course, the quantities being made part of the contract, removes this question from practical consideration. One used to hear, years ago, of quantity surveyors paying sums of money to make good their errors, but there was always a certain vagueness about these payments, and I have not heard of any lately. I understand that in L.C.C. Works, and perhaps in other departments, quantity surveyors are made liable for errors, but I cannot understand their accepting this liability except in the case of real negligence, and I do not think the system should be adopted. Architects are only liable in the case of negligence, and I do not see why quantity surveyors should not be placed in the same category.

Dispensing with the Quantity Surveyor.

Another matter of interest to quantity surveyors occurs to me, and that is obtaining tenders without the employment of quantity surveyors. No doubt in small matters of alterations to a building a fully detailed bill of quantities is too elaborate a process, and drawings and specifications are quite sufficient to enable a proper estimate to be obtained; but I am afraid that in larger works the practice of asking builders to take out their own quantities is increasing. Some few years ago it was, I think, agreed by the Master Builders' Association that they would not tender for works (except, I presume, small and trifling works) unless the quantities were taken out; but any such agreement should be strictly adhered to by the whole of the Master Builders' Association, and whether this has been so adhered to, or not, I do not know, but I am afraid there have been strayers from the fold.

The "Stores" System.

There are one or two other matters to be thought of in which the direct work of the quantity surveyor is being got rid of, and this affects the architect as well as the surveyor. I refer to the very large and increasing amount of work being done by the various stores, and by large furnishing, decorative, and building firms, without the employment of independent architects and surveyors. These firms do not say so, perhaps, in so many words, but they pretty clearly indicate that by employing them direct all the architect's and surveyor's fees will be saved, and everything go along as happily as can be. Well, we in this room know all about that.

The Incursive Auctioneers.

Then I think auctioneers are gradually making incursions into the domains of architects and surveyors, right of light matters, party wall matters, little building matters, and other work which a quarter of a century ago was all done by architects and surveyors. Most certainly some stop should be put upon these encroaching proclivities; and, so far as architects are concerned, I and other members of the R.I.B.A. intend to direct attention to the subject at an early date. It may seem undignified to intervene in such matters, but the point is, are we to sit quietly by and see our legitimate work taken away from us?

Writing the Specification.

The question sometimes crops up as to the writing of the specification. I think that where an architect employs the same quantity surveyor for all his work, an abstract specification prepared by the architect is sufficient; and in that case the fully detailed specification should be written by the quantity surveyor, so that the specification and bills of quantities are in thorough agreement. But if there is a surveyor employed who is not well acquainted with the architect's particular style of work, then, no doubt, the detailed specification must be handed to the surveyor before he takes out the quantities. Sometimes the architect is asked for the

THE MANUSCRIPTS ROOM, NATIONAL LIBRARY, PARIS. VIEW OF ONE SIDE AND DETAIL OF A BRACKET.

specification by his client before the tender is accepted, but I have said, when I have been asked, that when the tender has been accepted without variations, or the variations arranged, then the detailed specification would be written; in the meantime the quantity surveyor had received all the information he needed to prepare his quantities.

The Question of Fees.

Now a word or two as to the charges of quantity surveyors. It is a subject for keen regret that surveyors have not kept up the standard of their professional charges in the same as, on the whole, architects have. One hears now of surveyors undertaking to do work at a perfectly ridiculous rate of pay, particularly as regards work for public bodies. Of course, if the case is one of a large asylum or of a building of great area, with a fair amount of repetition, a comparatively small rate of percentage is understandable; but these absurd rates are not confined to these public buildings, and it behoves this Quantity Surveyors' Association, and all kindred institutions, to consider seriously whether some sort of agreement cannot be arranged by which all duly qualified surveyors shall adopt, and stick to, some recognised general scale of charges. Of course, in the case of unqualified men, any remuneration is more than sufficient, but with competent surveyors with reputations to preserve, I feel quite sure from the remarks I have heard as to charges, that they hardly cover for working up, let alone all the establishment expenses and the surveyor's own time. I know that competition in everything is very keen just now, and that the "slap-dash" surveyor will pocket more out of his ½ per cent. commission than a good man will out of his 1½ per cent.; but it is not every architect or every public body who knows this.

My own view as to surveyors' charges is that for a complicated "Arty-Arty" house, with every window and every door different, 2½ per cent. is not too much; that for an ordinary building, say up to £20,000, 2 per cent. is fair; that for plain straightforward large warehouses with plenty of "timesing," 1½ per cent. should be charged; and I should be very sorry to hear that for the biggest public building less than 1 per cent. was ever charged. I am not speaking of work in which the largest items or the greatest part consist of provisional sums, but where the quantities have been fairly taken out with only a small proportion of provisional sums. As to charges for variations on contracts, I do not think a surveyor should be paid a large commission for omitting these provisional sums and then a heavy charge for measuring up the work executed under these provisions. The charge in the ordinary way for ordinary variations used to be 1½ per cent. for omissions, and 2½ per cent. for measured additions; and, bearing in mind all the trouble of re-abstracting, re-billing, etc., in the case of omissions, and measuring, pricing, etc., in the case of additions, I do not consider these charges unfair.

"Independent" Quantity Surveyor.

I have said that competition is dreadfully keen just now; and, of course, quantity surveyors cannot escape it. But there is a limit even to this, and I think the line should be drawn by quantity surveyors in sending out letters to clients about to build. I suppose there could be no real objection, if a surveyor heard of a job going, to his soliciting the work from an architect, but in a letter recently addressed to some clients of mine by a firm of quantity surveyors offering their services, after stating that they did not know who the architect was, but that it was quite likely he was a gentleman of eminence with whom they were already acquainted, they used these words, viz.:—"It is quite usual nowadays for public authorities and for large firms to employ independent quantity surveyors instead of leaving the appointment in the hands of the architect, and we hope that we may be favoured with your confidence."

Conclusion.

Well gentlemen, I have strung together a few thoughts on what is, after all, a very important practice—a practice which, for its successful pursuit, demands no ordinary ability; it requires highly technical skill, tact, judgment, and knowledge of the world; all are essential for the quantity surveyor's practice; and added to this must be constant and unwearied labour in watching the markets, and in studying new inventions in the building trade and in the applied arts and sciences. The profession is one to be upheld with dignity, and to be pursued with strict regard to its rights and privileges, and I venture to conclude this paper by the expression of a strong hope that your members will be quite united in the desire and in the determination to render your work more sought after, and its value better appreciated.

Discussion.

Mr. S. Chatfeild Clarke, having proposed a vote of thanks, which was seconded by Mr. S. A. Stanger, and supported by Mr. Arnold E. Harris, Mr. H. H. Bartlett, Mr. W. A. Haskins, Mr. W. E. Davis, Mr. Allan Paul, and Mr. Assiter, who all spoke at considerable length,

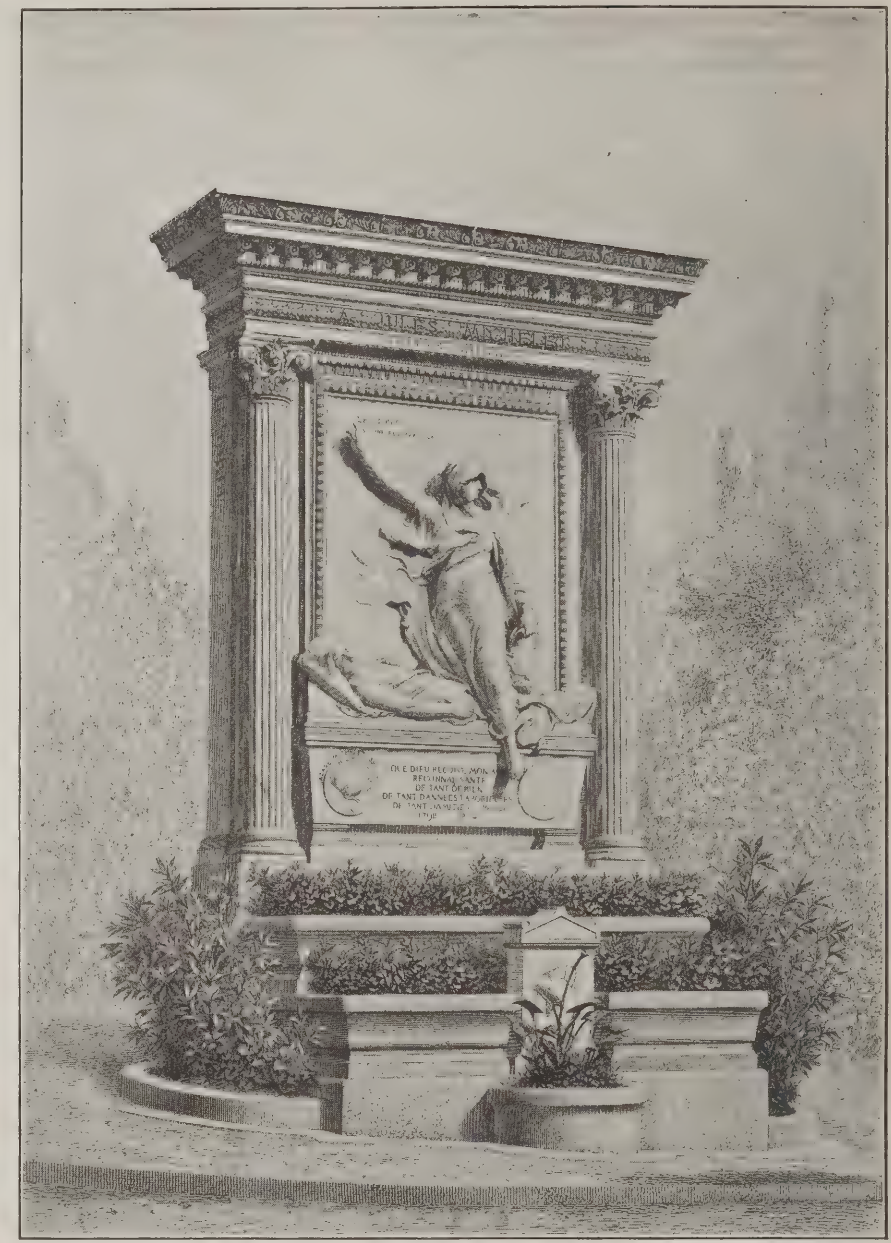
The President said that he should not at this late hour attempt to go all through the notes he had made, but he would like just to allude to the subject of the charges of quantity surveyors. No doubt the unfortunate fact exists that many surveyors have been tempted from time to time to respond to invitations to tender for quantities. In the fact of merely tendering, of course, there is no objection. Our friends the builders are tendering all day and every day, and the mere fact of doing so is nothing to do with it, but the question of tendering for quantities is a very different kind of thing from tendering for the supply of labour and materials. It means this, that if a man who is tendering for quantities puts in, as so many men have put in, ridiculously low prices, he cannot give the work which a client is entitled to expect when he asks for a bill of quantities. Of course, if a client will not pay, he cannot expect to have the work; but, on the other hand, the quantity surveyor ought not to allow himself to tender in the way some have unfortunately done. Public authorities are still apt to take advantage of the quantity surveyor, and he hoped those present would in every way support the policy of the Association. It is a very difficult question to deal with, he admitted, but the Council of this Association takes a very strong view indeed of quantity surveyors' duties in this matter. This Society is doing its very best to raise the status of the profession of quantity surveyors, and he was sorry that some of its friends still feel called upon to remain outside. He hoped that they would reconsider their position as to whether or not they could support this Society in its strenuous efforts to raise the status of the quantity surveyor, and to maintain its dignity as an honourable profession. They could never hope to raise the status of the profession and to carry out the suggestions made, unless they did combine. Architects found it necessary to do so, and they are very strict indeed in carrying out the regulations of their associations. Workmen have found it necessary to combine. Trades unionism is a very strong and potent force in the land, as we know to our cost perhaps; workmen find themselves able to dictate what remuneration they shall receive, and he (the President) failed to see why quantity surveyors should not be equally capable of combining to protect their own interests.

Mr. Woodward having replied, the meeting terminated.

THE CONCRETE INSTITUTE.

The first meeting of the Concrete Institute this session was held last Thursday evening at The Royal United Service Institution. Owing to the indisposition of Mr. Edwin O. Sachs, chairman of the Executive, the chair was taken by Mr. A. Ross, M.Inst.C.E., engineer to the G.N. Railway, who announced that the membership had risen to a total of 855.

Mr. Richard Humphrey, M.Am.Soc.C.E., who had consented to read a paper on "Some of the Application of Reinforced Concrete in America," was, owing to his manuscript having gone astray on the Continent, unable to read the paper he had prepared; but gave an extempore lecture instead, illustrated by a number of lantern slides. He emphasised the great need for further study and research into the question of reinforced concrete, detailing a number of points which required further elucidation, such as authentic data on continuous beams, the connection of beams and stanchions, the question of expansion and contraction, corrosion, the action of sea-water, etc. Their practical application of the material had gone far beyond their theoretical knowledge of it; and it was of vital importance that the research work should be brought up to date and kept level with their practical use. He thought if they went on in their present way, especially in America, the result might be disastrous. He gave details of the many tests and experiments being made in America. He had some 15 years' experience of the material in America, and had seen practically all the important works there, and his recent visit to Europe had been undertaken for the purpose of studying Continental practice. Personally, he thought the possibilities of concrete were limitless. One thing that had particularly impressed him in Europe was the artistic use of the material. In Germany and Austria he had seen many really beautiful structures in reinforced concrete. In America the material had mainly been used in a purely utilitarian way, and their progress had not been so rapid. The difficulty there, as here, was that the architect knew little about the material, and having been brought up in the old traditions of brick and stone, could not easily be brought to realise the possibilities of the new material. He required educating in the use of this, a plastic material, and once he had grasped its qualifications, this construction would rapidly advance. One thing that he had been very much struck by on his Continental travels was the question of mixing. He had seen concrete put in so dry that it required considerable tamping to bring the moisture to the surface. He thought that a great mistake, and he desired to emphasise the extreme importance of the mixing operation. After all, there must be a right and a wrong way of mixing, and it was therefore desirable to determine what the right way was. In America they had from mixing concrete too dry gone to the other extreme of mixing it too wet, so that the cement was practically washed out of the material. Now they had adopted the happy medium of mixing concrete neither too wet nor too dry. He paid a warm tribute to the present excellent cements that were produced; there was no finer building material made to-day. Though this might partly be attributed to the stringency of the specifications, he felt that the cement should have its due, and that it was often due to the excellence of the cement that faults in design and negligence in construction did not more often meet with the disastrous results that might be anticipated.


MONUMENT TO JULES MICHELET, EAST CEMETERY, PARIS. J. L. PASCAL, ARCHITECT.

The lecturer then proceeded to show his slides, representing all kinds of uses for concrete and reinforced concrete in the United States, from the building of bridges to the manufacture of garden furniture and ornaments, giving short disquisitions on each class of subjects. Two or three bridges showed the gradual progression of design from the copying of stone bridges to the lighter form of design now prevalent, and the elimination of the solid haunches. Other pictures followed of irrigation canals on the desert plains of the Pacific Coast, where timber was absent except for short scrub, and where the abundance of gravel and sand made concrete the only practical material to use. Pictures of farm buildings, grain silos, and water tanks followed, and the latter raised the question of the development of cracks and consequent leakage. The lecturer said that the insertion of steel for the purpose of meeting the changes of expansion and contraction, quite apart from that required to take the stresses, was the only effectual method of dealing with the difficulty. House building, said Mr. Humphrey, as several slides of houses were shown, was not very satisfactory at first owing to the poorness of the designs, but several slides were shown of a large house in the Renaissance style which the lecturer considered showed the artistic possibilities of the material. Tall chimney stacks brought up the interesting point concerning their elasticity under wind pressure. The lecturer instanced a case of collapse which was found to be due to want of elasticity. Concrete chimneys were practically built in rings and sections, each ring representing a day's work; and the various stages were very clearly marked in some of the views given. It was not easy to make an effectual join between the work of one day and the next, and the collapse in question was due to oscillation and subsequent fracture along the horizontal line of one of these joints. The difficulty was now obviated by the use of lime at these joins, which gave a less rigid joint than cement, and allowed for the necessary elasticity in the structure. Piles, Mr. Humphreys said, were a very valuable form of reinforced concrete construction, but he thought that there was no doubt that sea-water affected concrete. It had been very strongly demonstrated by actual tests that cement was affected by sea-water, and especially so in cases where wet concrete was deposited under sea-water. Some skyscraper stores and warehouses led the lecturer to remark that these buildings could be erected as cheaply, if not more cheaply, than with the more ordinary forms of construction. He instanced buildings of this class in reinforced concrete, which had been erected at a price per foot cube, of from 8 to 10 cents. Another application of concrete was in the manufacture of concrete sleepers for railways. Most of the big American lines had experimented with them and laid down trial stretches, such as the one shown on a slide. The early results had not altogether been satisfactory, because with these the rails were bolted direct to the sleeper, and it was found that the concussion of the heavy locomotives tended to shatter the sleepers. A number of patent concrete sleepers were now on the market with wooden blocks let in to take the rails and provide an elastic pad to eliminate the shock. Concrete sleepers did not as yet vie in point of cost with wooden ones; but the dearth of timber, its increasing price, and the difficulty of finding suitable wood, made it inevitable that some material like concrete would have to be employed in the near future.

The concluding slides were of laboratory testing apparatus, and open-air tests with slabs and beams, and of tests for fire-resistance, including a view of the giant testing machine for full size stanchions, etc., which we illustrated some time back. At the conclusion of his remarks, the lecturer was warmly applauded.

The chairman said that they were greatly indebted to Mr. Humphrey for the excellent extempore lecture he had given them, and for the many interesting points he had touched upon. Though the paper was not the one he had intended to give, he thought Mr. Humphrey would not object to answering any question.

Mr. C. F. Marsh, in moving a vote of thanks, said he was glad to say that the practice of mixing the concrete neither too wet nor two dry was one he personally always adhered to. He thought that the United Kingdom was too small a place to have the opportunities for the large buildings and bridges that were required or permitted in the United States. The by-laws here had prohibited the use of outside walls in reinforced concrete; but now that the London Building Act had been amended in this respect, he thought the architect would get his chance. As to cost, in a building erected by the Metropolitan Water Board, in which the structure was wholly in reinforced concrete, excepting the outer walls, he had worked out the cost as 4.6 pence per cube, a price practically identical with that mentioned by Mr. Humphrey. In concrete chimneys he thought it was the general practice to use lime at the joints in England. The worst feature of concrete construction were the cracks due mostly to temperature, and this had very grave effects on structures built to resist or retain water. He very much doubted whether it was possible to make concrete water-tight without the use of some impervious lining. The concrete roadway shown on one of the slides was extremely interesting, and might be worth trying in England. The method shown in other slides of building concrete houses by moulding whole walls in a horizontal position and raising them to the vertical by means of jacks, afterwards inserting the floors and joining up the corners, was also interesting, but he was afraid they would come down like a pack of cards in a high wind, and he, personally, would not care to live in such a house, especially in America, where they were subject to earthquakes.

Mr. Seraillier asked whether the concrete sleepers were set as close together as they appeared to be in the picture, and, in reply, the lecturer said that they were laid at the distance usually employed for wooden sleepers. Possibly the effect on the slide was due to foreshortening.

Answering another member who asked whether the curved dam shown, which had resisted the earthquake that destroyed San Francisco, was built of plain or reinforced concrete, the lecturer replied that it was built of plain concrete laid in blocks that interlocked, that was that the blocks were laid in rows and concrete filled in between them keyed into them.

Answering another question, Mr. Humphrey said the only way to obviate cracks in walls was to put in reinforcement specially to take the expansion and contraction. Another question on the subject of condensation elicited the reply that it was necessary to insulate the wall. Even the hollow block walls had not proved altogether satisfactory. A member intervened to say that at Harrogate there were houses built of hollow blocks, plastered direct on the block and papered that were perfectly dry.

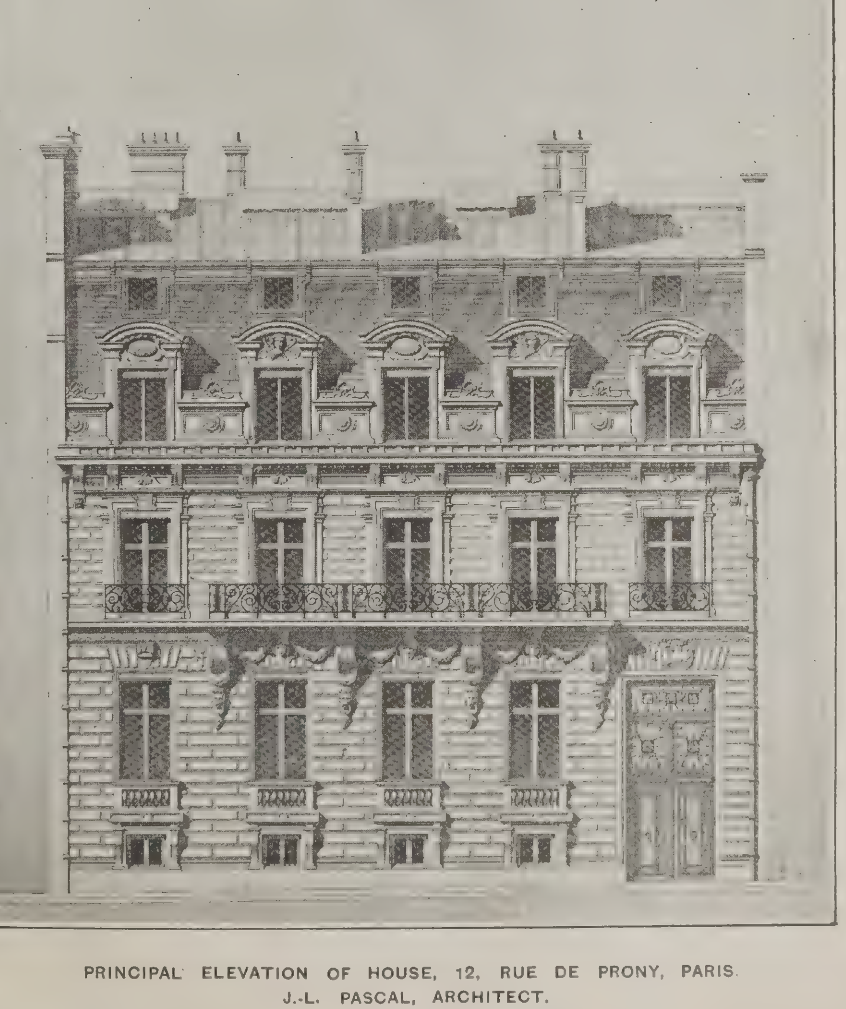
Mr. Wentworth Shields wanted to know whether the wooden cushion in the concrete sleepers had proved efficacious. He did not gather from the lecturer's remarks what had been the result of the innovation. When cold storage buildings were first built of concrete, it was hoped the poor conductivity of the concrete would prevent the heat penetrating into the cold rooms. But at Southampton, where they had a big cold store, it was found necessary to put in an insulation of wood and sawdust. He also desired to know Mr. Humphrey's opinion as to the best material to put on a flat concrete roof.

Mr. Etchells mentioned that Mr. Humphrey was their Envoy to America in the matter of the co-ordination of symbols. Having failed to agree to conform to the Continental notation, they were hoping to form an entente with America on the subject. He desired to know whether the beams, bench-moulded and brought on the site, were, in Mr. Humphreys' opinion, as strong or stronger than those moulded in situ.

Mr. H. G. Bamber thought that where concrete had been affected by the action of sea-water, it was due to faulty construction. The addition of pozzalano to concrete so exposed had been advocated, and experiments on the same line as those in America were being conducted here. The damage mentioned occurring to concrete deposited under the water was, he thought, less serious than supposed, and was mainly confined to the surface. On the subject of corrosion, he produced a piece of a drill, which had been accidentally buried in a concrete sea wall at Barbadoes for over 40 years, which had been sent over for the inspection of those members charged with an investigation into this subject. Its condition he considered absolute proof of the preservative qualities of well made concrete.

Mr. Humphrey, answering some of the later questions, said it was too soon to speak of the success of the sleepers with the wooden cushions. There were other points in the matter, such as the complaint of the locomotive engineers that the rigidity of these sleepers damaged the locomotives. Concrete cold storage buildings had to be insulated; it was customary in America to do so. As to concrete roofs, if they had not been properly reinforced, and had cracked, it was necessary to cover them with some elastic material like tarred felt, asphalt, etc. No other course was permanent or effectual. Personally, he preferred beams moulded in situ.

The vote of thanks having been formally seconded, was put and carried by acclamation.



PRINCIPAL ELEVATION OF HOUSE, 12, RUE DE PRONY, PARIS.
J.-L. PASCAL, ARCHITECT.

THE PLUMBERS' COMPANY'S APPRENTICESHIP BOARD.

The Plumbers' Company, of which the present Lord Mayor (Alderman Sir John Knill) is Master, attaches great importance to the training of the plumber. In no craft are skill and efficiency more vital to the common interest. It is estimated that of the total quantity of water conveyed to London for the daily needs a quarter or a third is wasted owing to defects in the mains. This is merely a financial matter, but where drainpipes are badly laid, the health of the community is endangered. Some years ago, with a view to raising the standard of all plumbing work, the Plumber's Company instituted an Apprenticeship Board, the members of which were representatives of the Company, of the Master Plumbers' Association, of the Operative Plumbers' Association, and of others concerned. The Company has a register of apprentices indentured to approved employers, the Company standing sponsor, so to speak, for each apprentice. From time to time the Company, as provided by the conditions of the indenture, inspect the note-books and drawings of the apprentices attending technical classes in plumbers' work, and inquire as to their attendance. This system of modernised apprenticeship—part practical work and part instruction in the underlying principles—is linked up wherever possible with the Company's system of registration of qualified plumbers all over the Kingdom by means of the various local councils. Excellent reports respecting the progress of the work of revived apprenticeships have been received from Dumfries and from Glasgow. At the last Court of the Company awards were made for excellent work and satisfactory attendance at the classes during the year.

In 1906 the Company identified itself with the arrangements for a conference of labour, municipal, and education representatives with a view to definite co-operation of those interests, and this conference was held at the London Guildhall under the presidency of the late Viscount Selby. A committee was then appointed to inquire into the whole system of industrial education and apprenticeship, and to report to an adjourned conference. This committee has since its appointment collected and collated a vast amount of valuable information from trade unions, trade councils, municipal authorities, engineers, architects, large employers of labour, educational authorities, Chambers of Commerce, and others, for submission to the adjourned conference. Working plumbers themselves regard apprenticeship very favourably. In fact, their trade union, the Plumbers' Association of Great Britain and Ireland, which has branches in all the cities and towns of the United Kingdom, has passed resolutions strongly advocating the principle. Moreover, the question of apprenticeship is taken into consideration by the various registration councils of the National Registration of Plumbers in deciding as to the eligibility of an applicant for entry on the list of registered plumbers. To the present Lord Mayor and his father, the late Sir Stuart Knill, who preceded him as Master of the Plumbers' Company, is largely due the success which has attended the efforts of that Company in helping to revive the apprenticeship system, as well as to secure the registration of properly qualified plumbers.

A NEW THEORY OF PROPORTION.

A lecture on "A New Theory of Proportion, as applied to the Facades of Grecian Temples," was delivered by Mr. G. S. Aitken, architect to the Edinburgh Architectural Association, on November 17th, Mr. John Watson, F.R.I.B.A., President, in the chair.

After reference to Vitruvius, to the work done by Sir James Pennethorne and Mr. Penrose, on the optics and refinements of Greek architecture, and to the system of proportion formulated by Mr. Watkiss Lloyd, and to Mr. D. L. Haig's labours in the middle of the nineteenth century, and Professor Kelland's approval of them, the lecturer thought however, that Mr. Haig's interesting theories did not accord with the facts of the Parthenon to which he applied them. A solution was sought in a letter of Sir Isaac Newton's, where a remark about the sides of polygons graduating with rectangles furnished a workable basis.

The remainder of the lecture was devoted to this, and took the form of applying the angles of 60 degrees and 30 degrees, which arose out of the hexagon, and of 67½ degrees, 45 degrees, and 22½ degrees, furnished by the octagon, to a series of thirty-one Greek temples, in which it was shown that they could all be built up from the given basal line of the upper step of the stylobate, by using these singles, or combinations of them with arcs of circles to determine the height of the columns, and of the entablatures and pediments.

The Thescum, for instance, is worked out by employing an angle of 22½ degrees for the lower part, and of 30 degrees for the upper part of the facade. A divided line of 60 degrees fixed the diameter of the columns, and interesting angles of 45 degrees and 30 degrees determined the depth of the stylobate. The application of angles varied according to the effect which the Greek architect desired to produce.

It was pointed out, in conclusion, that the use of the law that regulated the design of the Greek temples, would be to the æsthetic advantage of modern architecture, and that successful acoustics depended upon the knowledge of it.

CHATEAU DE MAUBUISSON. CLAIREFONTAINE (SEINE-ET-OISE). EAST FRONT.
J.-L. PASCAL, ARCHITECT.

SLATING AND ROOF TILING.

Measurement Codified.

We have received copies of pamphlets showing, respectively, (1) the "Customary rules of measurement codified by the principal master slaters and tilers in the London and South of England Districts," revised to date in accordance with the standard system of measurement of slating and tiling; and (2) "The standard system of measurement of slating and roof tiling as agreed upon by the Council of the Quantity Surveyors' Association and the London Association of Slate Merchants and Master Slaters." Both pamphlets can be had, price 2s. 6d. each, from the Hon. Treasurer, London Association of Slate Merchants and Master Slaters, 25/26, Bermondsey Wall, London, S.E.

The following are the customary rules of measurement as codified and revised by the Standard System of Measurement, as given in pamphlet (1). The second pamphlet embodies the same data in a form suitable for quantity surveyors.

Slating.

Slating.—Net area, after deducting all openings containing 4ft. superficial or over.

Mansard, Vertical, Dormer Cheeks, small surfaces under 10ft. superficial, circular Conical, Octagonal or Turret Roofs to be measured separately.

Eaves.—A lineal measurement to be taken to the equivalent of 12ins. deep.

If irregular or cut to follow drips of gutters an extra measurement of 6ins. to be taken.

In the case of all Random Slating add a further 6ins.

If bedded or pointed, to be charged separately.

Verges.—A lineal measurement equivalent to 6ins. wide to be taken at all square Verges, and Secret Gutters.

If on rake take an additional 6ins.

If slate and a half or special wide slates are used add a further 12ins.

Top Edge.—A lineal measurement equivalent to 6in. deep to be taken on either side of Ridges, under sills of Dormers, Lanterns, Skylights, and any openings where top course slates are used.

Square Abutments.—A lineal measurement equivalent to 6ins. wide to be taken where Slating adjoins sides of all Chimney Stacks, Dormers, Skylights, and other openings; also at one end of slope where Slating finishes between parapet or party walls.

Circular Cutting.—A lineal measurement equivalent to 12ins. wide to be taken.

Raking Cutting.—A lineal measurement equivalent to 6ins. wide to be taken at all rakes.

Valleys.—A lineal measurement equivalent to 6ins. wide to be taken on both sides of all valleys.

If special wide slates or slate and a half are used take an additional 12ins. on both sides.

Hips and Angles.—A lineal measurement equivalent to 6ins. wide to be taken on both sides of all Hips and Angles.

If special wide slates or slate and a half are used, take an additional 12ins. on both sides.

Mitre Cuttiug.—A lineal measurement to be taken for all Mitres (in addition to the usual cutting), whether at Hips, Valleys, or other places where slates are close cut; to include all necessary oil cement.

Ridge and Hip Coverings.—A lineal measurement of all Ridges and Hips, including setting and pointing in cement.

CHATEAU DE MAUBUISSON. CLAIREFONTAINE (SEINE-ET-OISE). WEST FRONT.
J.-L. PASCAL, ARCHITECT.

All Splays, Cut Ends, Mitres, Intersections and Top Ends to be numbered and taken separately.

Tiling.

Tiling.—Net area, after deducting all openings containing 4ft. superficial or over.

Mansards, Vertical, Dormer Cheeks, small surfaces under 10ft. superficial, Circular, Conical, Octagonal or Turret Roofs to be measured separately.

Eaves.—A lineal measurement equivalent to 8ins. deep.

If irregular or cut to follow drips of gutters, an extra measurement of 6ins. to be taken.

If bedded or pointed, to be charged separately.

Verges.—A lineal measurement equivalent to 6ins. wide to be taken at all square Verges and Secret Gutters.

If on rake take an additional 6ins.

Top Edge.—A lineal measurement equivalent to 6ins. deep to be taken on either side of all ridges, under sills of Dormers, Lanterns, Skylights, and any openings where top courses are used.

Square Abutments.—A lineal measurement equivalent to 6ins. wide to be taken where Tiling adjoins sides of all Chimney Stacks, Dormers, Skylights, and other openings; also at one end of slope where Tiling finishes between parapet or party walls.

Circular Cutting.—A lineal measurement equivalent to 12ins. wide to be taken.

Raking Cutting.—A lineal measurement equivalent to 6ins. wide to be taken at all rakes.

Valleys.—A lineal measurement equivalent to 6ins. wide to be taken on both sides of all Valleys, including all necessary tile and a half.

Bedding and pointing to open Valleys to be charged separately.

Valley Tiles to be measured extra only, over the usual measurements on both sides.

Hips and Angles.—A lineal measurement equivalent to 6ins. wide to be taken on both sides of all Hips and Angles to include all necessary tile and a half.

Hip and Angle Tiles to be measured extra only, over the usual measurement on both sides.

Mitre Cutting.—A lineal measurement to be taken for all Mitres (in addition to the usual Cuttings) whether at Hips, Valleys, or other places where tiles are close cut, to include all necessary tile and a half.

Ridge and Hip Coverings.—A lineal measurement of all Ridges and Hips, including setting and pointing in cement.

All Splays, Cut Ends, Mitres, Intersections and Stop Ends to be numbered and taken separately.

Societies' Reports.

Glasgow and West of Scotland Technical College.

The annual report of the one-hundred and thirteenth session of the Glasgow and West of Scotland Technical College shows continued development in the work of the college, the number of students being 5,824. In the department of Architecture and the Decorative Trades, there were 50 day students and 688 evening students—total, 738, and in the plumbing classes there were 414 evening students. It is noted that the third section of the new buildings, which completes the facade to George Street, has been finished, and will be occupied next session; while the site for the fourth section, facing John Street, has been cleared, and considerable progress has been made with the foundation work, and it is hoped that the section will be ready for occupation in September, 1910. It is stated that the joint committee of the School of Art, and the college, in charge of the School of Architecture, have approved a proposal of the Director of Architectural Studies, that the diploma of the school be awarded only to students who have attended day classes for a period equivalent to two sessions. Mr. T. L. Watson, F.R.I.B.A., is convenor of the governors of the Committee on Architecture; Mr. James M. Monro, F.R.I.B.A., and Mr. Alexander Wingate, representing the Glasgow Institute of Architects.

The fourth meeting of the session was held in the College Buildings on Friday, 19th inst., when Mr. F. L. Hastie delivered a lecture, the subject being, "A Framed Building." At the outset Mr. Hastie drew attention to two main factors in steel construction, viz., economy and strength, and pointed out that all such buildings should be designed at the lowest possible cost—not necessarily cheap work, but substantial. He then described by use of illustration the methods of setting out, and the means of calculating the strength and section of the component parts. Several points of construction were also shown. The preservation of steel work was also described, and the lecture concluded with reference to the specification and the preparation of schedules for such work. Mr. Colin Sinclair, M.A., opened a discussion, in which several members took part.

Northern Architectural Association.

A meeting of the students of the Northern Architectural Association, Newcastle-on-Tyne, was held on Wednesday, November 20th, when Mr. J. G. Smith read a paper entitled "Portland Cement Manufacture and Testing." After giving a brief outline of the history of its manufacture, Mr. Smith dealt with the great progress made in recent years in the grinding of cement, his remarks being accompanied by practical demonstrations of passing cement through a sieve of 32,400 holes per sq. in. Mr. Smith also described the expansion test, which has been welcomed by many cement manufacturers, who see in its adoption the more equal consideration of a cement whose strength is progressive, than one which, while giving a superior result on the seven days' tensile test, yet deteriorates afterwards. During the evening students were afforded an opportunity of examining a testing machine, a number of briquettes being tested for tensile strength. Previous to the meeting the students partook of afternoon tea on the invitation of the President.

Notes and News.

Messrs. Saunders, Todd and Co., manufacturers' agents, Maritime Buildings, Newcastle-on-Tyne, inform us that they have been appointed agents for Northumberland and Durham for Messrs. Gibbs and Canning, Ltd., of Tamworth, terra-cotta manufacturers.

* * *

Lady Evelyn Guinness has unveiled a memorial to "Ouida," which has been erected at the west entrance to the town of Bury St. Edmunds, near the house where the authoress was born. It takes the form of a rectangular fountain basin, from the centre of which rises a pier flanked by two symbolic figures in bronze, one representing Sympathy and the other Courage. The principal face of the pier is occupied by a bronze relief portrait of "Ouida," and the arms of Bury St. Edmunds.

* * *

Last year's Belgian tour undertaken by the Sheffield and Yorkshire master builders was brought vividly before the minds of those of them who were present at a lecture in the Builders' Exchange, Sheffield, last week. The subject was, "Cities of Belgium," and was dealt with in an interesting manner by Mr. J. Batey. Excellent lantern illustrations added to the interest of the lecture, which was promoted by the Building Trades Exchange and Club.

* * *

We learn from the Natal Government Agency that as from the 1st January next, the preference on railway rates from Delagoa Bay to railway stations in the Transvaal between Germiston and Klerksdorp, inclusive, will be reduced in favour of Durban as follows:—Intermediate class by 2s. 11d. per ton; intermediate "B" class by 1s. 3d. per ton; in rough, rough "B" and "C" classes 2s. 1d. per ton; imported produce, fencing, fertiliser classes, 10d. per ton. This is *in addition* to the reduction effected on the 1st July last, which was as follows: — Intermediate classes by 2s. 11d. per ton; intermediate "B" classes by 2s. 11d. per ton; rough goods "B" and "C" classes by 2s. 1d. per ton; fencing, fertilisers, imported produce, by 10d. per ton. The intention of the further reductions is to divert a portion of the trade at present travelling by Delagoa Bay, it having been found that the reduction made on 1st July last was insufficient to accomplish that object. Attention is directed to the advantage of consigning goods via the Port of Durban, as the effect of the further revision in rates is that the difference in favour of Delagoa Bay will be only 4s. to 5s. per ton, after allowing for the additional shipping freight and expenses at the latter port, which difference is outweighted by the superior facilities for wharfage, handling, trucking, and transportation of consignments of all descriptions at the Port of Durban. Full information will be supplied on application to the Commercial Agent, Natal Government Agency, 26, Victoria Street, S.W.

Messrs. Drew-Bear, Perks and Co., Ltd., of Battersea Steel Works, Wellington Road, London, S.W., have been entrusted with the contracts for steelwork at the New Grenville Hotel, Bude, Cornwall; Wellington House, London, S.W.; and in the reconstruction of No. 2, Seamore Place, Park Lane.

* * *

Arrangements have been completed for the construction of a new goods railway line at Coventry, estimated to cost about £2,000,000. This extension will connect with the main line to the Metropolis, and also join the Nuneaton branch line, serving various important collieries.

* * *

At the morning service in Winchester College Chapel, on November 22nd, Dr. Burge, the Headmaster, dedicated a new organ, which has been placed in the new gallery, erected from designs by Mr. W. D. Caröe, at the west end. The instrument which is still incomplete, includes some of the pipes and two of the stops of the organ built in the Chapel by Renatus Harris in the reign of Charles II. It is played from a console placed in the old organ chamber at the north-west end of the chapel, where a new gallery has been built for the purpose. The Warden of Winchester (Sir Kenneth Muir-Mackenzie) and Mr. Mark Hambourg were present at the service.

* * *

Mr. Thackeray Turner, secretary of the Society for the protection of Ancient Buildings, recently wrote to the Royal Commission on Historical Monuments (England) inquiring whether the Whitgift Hospital, Croydon, had been placed on the list of monuments decided by the Commission, in accordance with the terms of reference, to be most worthy of preservation. Mr. George H. Duckworth, secretary, states in his reply: "The Commission have not yet begun their investigations in the County of Surrey, and therefore no list of 'selected' monuments in that county is as yet in existence. But, at the same time, I am to add that the Commission have good reason to believe that the hospital will be so included when the time comes, and they trust that some means may be found to secure its complete preservation." The Ruri-Decanal Chapter of Lambeth have unanimously passed a resolution praying the Croydon Council to find some other means of meeting the public convenience than by destroying the hospital. It is recalled that the hospital was founded for the poor of Croydon and Lambeth alike, and the question is now being asked to whom does it belong, and it is considered that the whole question must shortly be the subject of public inquiry.

SURVEYORS AND TOWN PLANNING.

At the Surveyors' Institution, Westminster, Mr. W. R. Davidge addressed the members on the subject of town-planning systems. He said that in many of the newer cities of the world which had been completely planned from their very commencement, the result was the construction of a fine and spacious town, but the very regularity of such a city might become almost painful. The disadvantages to which a strictly rectangular system was subject, if there were no diagonal or other streets in an oblique direction, was plainly apparent.

The radiating system was perhaps the ideal one, if the "hub" was of sufficient attraction or importance to the community. This idea, however, must be carried out in such a way as would not oppress the beholder with a sense of monotony or wearisome repetition of precisely the same vista, however beautiful. Probably the cities which really most charmed them and which lived in their memories long years after they had visited them, were the quaint old-world places, with their irregular streets, their quiet, dreamy squares, or their bustling market places withal overshadowed by some grey old minster or some monument of the past; or perhaps their thoughts strayed to some quaint cluster of houses nestling round its village green.

Much of the charm of these cities was undoubtedly due to their associations and to the atmosphere of antiquity which surrounds them, but beyond all these there were many things which might well be studied with advantage by the most up-to-date of town-planners. Town after town of mediæval times owed its picturesqueness, its quaintness, and often much of its artistic charm to the skilful grouping of the buildings, and, perhaps above all, to the intuitive sense of proportion in the —to us— haphazard dimensions and arrangement of the public "places," and to the irregular outlines of the street frontages.

In town planning each town must have an individuality of its own and natural assets, such as hills, woods, and water, must be preserved and extended. Long, straight streets, when adopted, should have a definite "motive," but slight curves or irregularities in frontage lines might in many cases be adopted with advantage. Line of sight should, in most cases, be restricted within reasonable limits, i.e., lines of long streets should be broken, and all views should as far as possible be framed in a suitable setting. The grouping or arrangement of the principal buildings and open spaces should in all cases be specially studied with a view to securing the best effect for the whole. No planning scheme could be considered as complete without a sufficiency of open spaces, and due regard must be paid to proportion and to architectural design.

Proposed New Works.

BELFAST.—A L.G. Board enquiry has been held into the application of the Corporation for a loan of £30,00 to erect a new public abattoir, and £2,750 for providing a disinfecting station.

BO'NESS. The North British Railway Co. are seeking to acquire land near the Bo'ness Electricity Works for the purpose of erecting a station.

BUCKHAVEN AND METHIL. — The Town Council are about to erect a public abattoir here at a cost of £4,500. Mr. W. D. Telfer, Burgh surveyor, has prepared the plans.

BURY.—The L.G. Board has held an enquiry into the application of the Corporation for a loan of £15,500 for the building of 52 working class dwellings in Bolton Road.

DUBLIN.—The Finance and Leases Committee of the Corporation have recommended the erection of new municipal offices in Lord Edward Street at a cost of £30,000 to £40,000.

DURHAM COUNTY.—The County Council have decided on the recommendation of their Education Committee to build new schools at Butterknowle and Tow Law.

EDINBURGH.—Another addition is to be made to the public slaughterhouse at Gorgie, consisting of a two-storey building, comprising tripery, piggery, pennage, slaughter-hall, cooling-hall, mess rooms, offices and stores.

GREENOCK.—A new drill hall for the Greenock Territorial battalion is to be erected at the junction of Kelly Street and Finnait Street. The building, which will provide accommodation for 1,100 men, will cost between £4,000 and £5,000.

METHYR.—The County Borough Council have applied for a provisional order to acquire a site for the purpose of erecting a central library and education offices, and for power to raise moneys for the erection thereof.

MIDDLESBROUGH.—The Town Council have passed plans for a skating rink to be erected in Park Road South. The building was to be steel-framed, covered with weathered timber, and would accommodate about 2,500 people. There would be six exits, and the building would be lighted with electricity. Mr. W. Duncan is the architect.

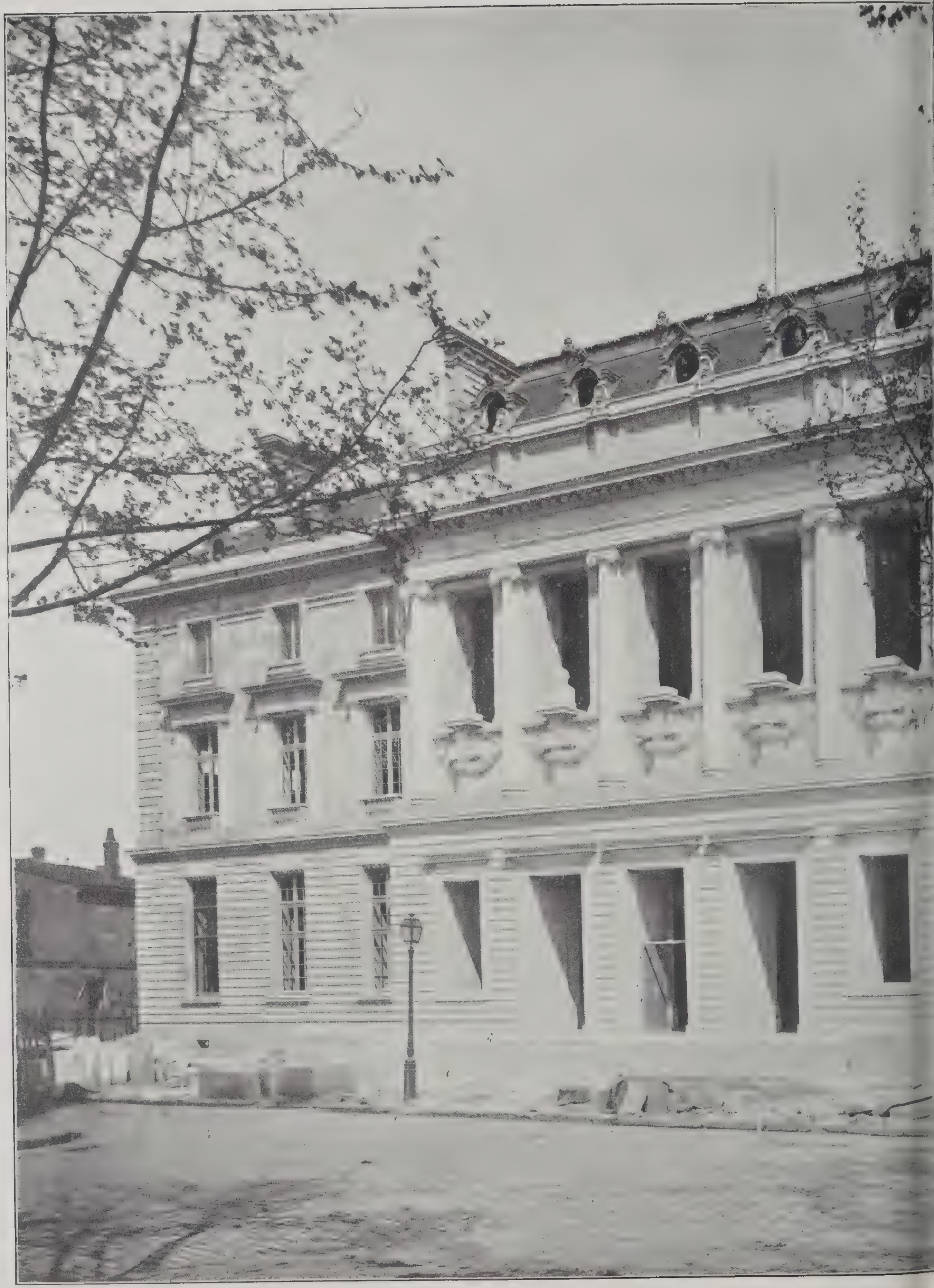
PATELEY BRIDGE.—Proposals have been made for the erection of a public abattoir here at a cost of about £800.

Notes on Competitions.

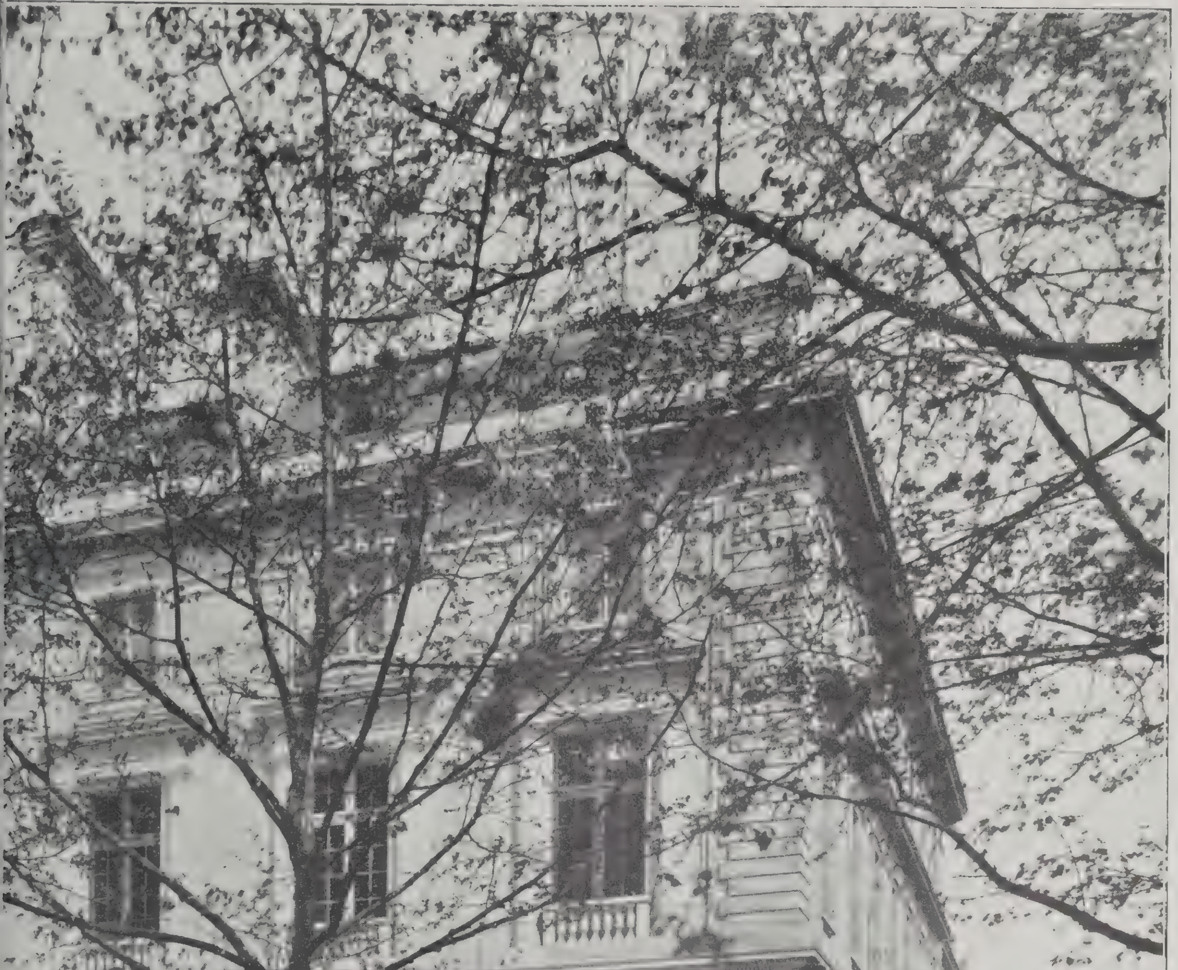
LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION
Dec. 1.	TRALEE. CARNEGIE LIBRARY AND TECHNICAL SCHOOL. Cost not to exceed £4,500. Premiums of £20 and £10 for design placed first and second by the assessor. Copies of instructions and conditions from the Town Clerk, Tralee.
Dec. 1.	PUBLIC PARK PLAN, BANGOR (COUNTY DOWN). The U.D. Council offer a premium of £30 for the best scheme for laying out a public park, twenty acres in extent. Premium to include all expenses of successful competitor, whose designs become the property of the Council. Schemes to J. Middleton, Town Clerk, Town Hall, Bangor, County Down.
Dec. 3.	PRINCE HENRY'S GRAMMAR SCHOOL, OTLEY. New buildings in Farnley Lane, Otley. If the number of applications to compete is excessive it is intended by selection to invite 20 or 25 architects only to compete. A fully-qualified non-competing architect, in conjunction with the West Riding Education Committee's Inspector of Secondary Schools, will assist the Governors in adjudicating upon the plans. Applications, stating qualifications and experience, must be received by Ernest S. Mead, Clerk to the Governors, East View, Otley, before the date named.
Dec. 11.	MINEHEAD. SHELTER, with cloakroom and lavatories, on the Beach, the whole expense of which is not to exceed £3.000. Premium of £20. Plan of site and conditions from L. C. Webber-Incledon Clerk to U.D. Council, 16, Park Street, Minehead, Somerset.
Dec. 18.	TRAINING COLLEGE FOR TEACHERS, Kirkstall Grange, Far Headingly, Leeds. Architects practising in Leeds are invited to submit competitive designs for the above College. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed Assessor. Copies of the conditions of competition and instructions, a plan of each floor of the educational blocks and of the hostel blocks, also an estate plan, showing a suggestion for grouping the various buildings, may be obtained from James Graham, Secretary for Education, Education Department, Leeds. Designs to be delivered not later than 12 o'clock noon. Deposit: £2 2s.
Dec. 31.	SOUTHEND-ON-SEA. NEW COUNCIL SCHOOL. Limited to Architects practising in the Borough. Conditions of competition and plan of site on application to J. W. Barrow, Clerk to the Education Committee, Education Offices, Municipal Buildings, Southend-on-Sea.
1910. Jan. 1.	LARNE. TECHNICAL SCHOOL IN VICTORIA STREET. For the Larne Technical Instruction Committee. Total cost, including fixtures and enclosing of ground, not to exceed £3,600, Premium, £21, merged. Successful competitor will receive commission of 5 per cent. for supervision, including plans, specifications, estimates, and *Bills of Quantities*. Particulars of Thomas Clearkkin, Secretary, Technical In-Instruction Committee, Larne.
1910. Jan. 31.	NATIONAL MUSEUM OF WALES. The Council desires to receive competitive designs for the erection of a new National Museum at Cardiff, Three premiums are offered of £200, £150, and £100, for second, third, and fourth. The Council have appointed Sir Aston Webb, R.A., Mr. John J. Burnet A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A., as Assessors. Particulars and plans of the site will be supplied to competitors on payment of a fee of £2 2s., returnable if all papers are returned within 14 days. Inquiries to be addressed to Dr. Wm. Evans, Hoyle, Director of the Museums. City Hall, Cardiff.
Feb. 1.	OLDHAM, EXTENSION OF THE TOWN HALL. Restricted to Architects practising or residing in the Borough. Premiums of £50, £30 and £20, for the three designs placed 1st, 2nd and 3rd, and a sum of £5 will be paid to all unsuccessful competitors who send in a complete set of plans in accordance with the instructions. Plan of site, with instructions and suggestions for architects obtainable from E. C. Foote, Borough Surveyor, Town Hall, Oldham. Deposit: 21s.



COLLEGE OF MEDICINE AND PHARMACY, BO



JX. JEAN-LOUIS PASCAL, ARCHITECT.

Mar. 1.	GLAZED BRICKWORK DESIGNS AND ESSAYS. A committee of glazed brick manufacturers invite designs for works to be executed in glazed brickwork, also essays as to the advantages to be derived from the use of this material in accordance with conditions to be obtained from J. Johnston Green, 142, Liverpool Road South, Southport. Premiums of 100 guineas, 50 guineas and 25 guineas awarded to designs and essays jointly. Assessor Mr. Max Clarke, F.R.I.B.A., appointed by the President, R.I.B.A.
No Date.	CRADLEY HEATH. The trustees of the United Methodist Church invite Architects to submit designs on approval for Sunday School with seating accommodation for about 1,000. For particulars, Mr. C. Clee, Cradley Heath, Staffs.

Institution of Civil Engineers' Building.

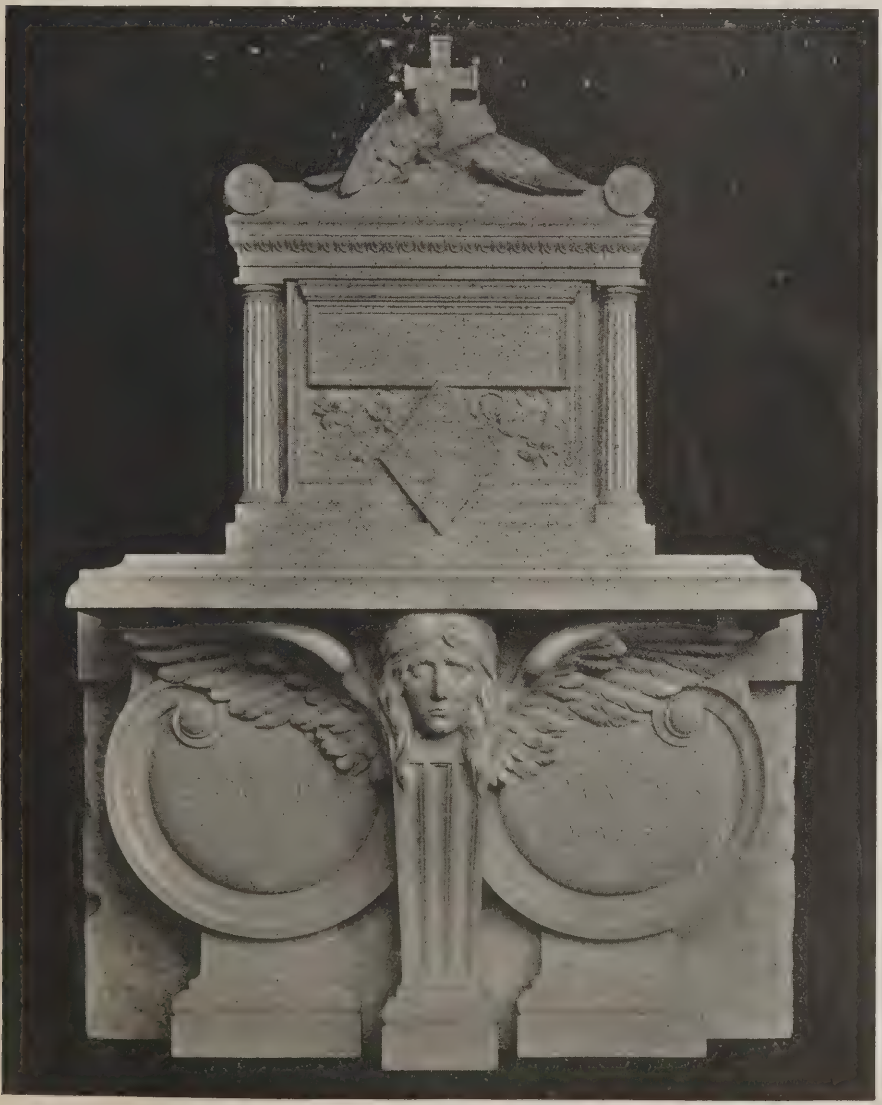
Arrangements have now been made with H.M. Office of Works for the acquisition of a new site for the above building, which will be proceeded with early next year. The Council have invited competitive designs for the new premises from six architects.

The Welsh National War Memorial at Cardiff, which has been unveiled by General Sir John French, is now nearing completion. It stands on a fine site in the main avenue of Cathays Park. It is by Mr. Albert Toft, and is the result of a competition, in which Mr. Toft was the successful sculptor. The memorial, which stands about 25ft. high, is in the Italian Renaissance style, and the meterials used are Portland stone and granite with bronze statues.

THE ARCHITECTURAL ASSOCIATION.

Annual Conversazione.

The conversazione was held last Wednesday evening at Tufton Street, and proved more than ordinarily successful. The Octagon Hall had been prettily decorated for the occasion, and some changes had been made in the arrangements; the refreshments being served on the ground floor, and the classrooms on the first floor being thrown into one, forming a crush hall. Round this were hung an excellent collection of water-colour drawings. The visitors, who must have numbered some hundreds, prevented more than a cursory glance at these, but we noticed some by Mr. Douglas Robinson, Mr. Ernest George, Mr. Leslie Wilkinson, Mr. Mervyn Macartney, and others. A collection of drawings by the late Mr. Fulleylove, lent by Mrs. Fulleylove, were of great interest, and the City Corporation lent some fine drawings of old and new London Bridge, by E. W. Cooke. Among other fine water-colours was one of Burges' scheme for decorating St. Paul's, from the brush of Mr. Axel Haig. The galleries were hung with specimens of students' work, and there was some very excellent work among it. The president, Mr. Henry Tanner, received the guests on the first gallery at the top of the stairs. Among them we noticed Mr. Ernest George, Sir A. Brumwell Thomas, Mr. Walter Cave, Mr. Leonard Stokes, Mr. R. S. Balfour, Mr. G. H. Fellowes Prynne, Mr. H. Seth-Smith, Mr. R. Phené Spiers, Mr. F. Dare Clapham, Mr. C. Wontner Smith, Mr. Maurice Webb, Mr. Edwin Gunn, Mr. W. E. Davis, Mr. T. L. Dale, Mr. T. Frank Green, Mr. H. P. G. Maule, Mr. J. Buyers Scott, and many others. Pitman's Blue Viennese Orchestra played in the Octagon, and the A.A. Musical and Dramatic Society supplied part songs and quartettes.



MONUMENT TO THE LITTLE GIRLS WHO PERISHED IN THE FIRE AT THE BAZAAR DE CHARITE, PARIS. J.-L. PASCAL, ARCHITECT.

Correspondence.

[*The Editor declines responsibility for the statements made or opinions expressed by correspondents.*]

Quantities and Contracts.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—May I thank you for your article in your issue of Wednesday last dealing with "Builders' Quantities." To those of us who are engaged in the strenuous struggle for existence, against competition of all sorts—keen, illegitimate, and corrupt—your article was very refreshing. The position of the average builder is too precarious for him to engage in open warfare with the architectural profession; and unless his case can be understood and stated by one occupying neutral ground his wrongs will remain unredressed.

We are too often tricked out of common rights by ingeniously contrived contracts, which we are urged to sign because "they are always signed by other builders," and because "they have no meaning in practice," but which we know to be terrible engines of oppression when brought into action. Even our much vaunted agreement compiled by the R.I.B.A. and the National Federation is open to gross misuse.

But my purpose is to thank you very warmly for the courageous and impartial attitude you so consistently have followed towards the builders.

To you, as far as I know, belongs the honour of being the first editor of a journal devoted to architecture to plead for equity in building contracts. You have so far done this with commendable clearness, force, and conviction. With such able assistance, some of the shadows that have haunted builders for over two generations may yet be removed.

"CONTRACTOR."

AN OPENING IN VANCOUVER.

A subscriber who is in practice as an architect in Vancouver desires to obtain an assistant who is a thoroughly competent draughtsman, and a good all-round man, and he intimates that the appointment might ultimately lead to a partnership. It will be seen from our advertising columns that application is to be made in the first instance to the editor of this journal, who, while accepting no responsibility in the matter, is willing to oblige a Vancouver subscriber by conducting the necessary preliminaries. The advertisement appears on page xxii.

ROME'S NEW PALACE OF JUSTICE.

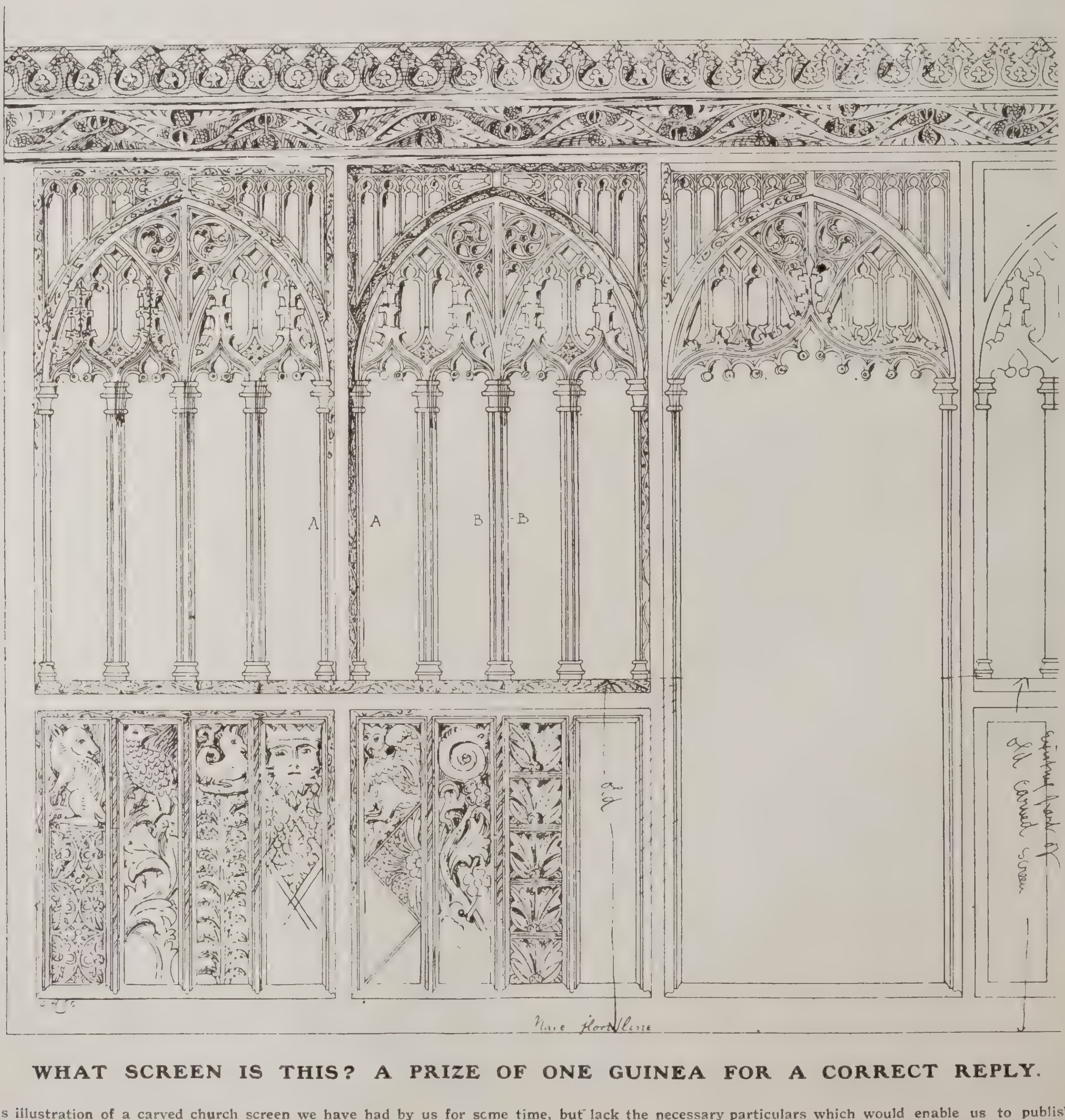
The new Palace of Justice, after 20 years, is still unfinished. This structure, comments the Rome correspondent of the "Times," is typical of the slow, and not always fortunate, growth of the capital of Italy. Begun in 1889, at a period of some financial depression, its original cost was determined at £200,000, a sum which was almost at once raised to £1,040,000 by a special commission who apparently thought economy misplaced in the case of so important an edifice. Even so the contracts threatened to outrun the estimates, and a second commission, in 1892, raised the total cost to £1,480,000.

This summer Signor Bertolini, Minister of Public Works, informed the country that £1,534,840 had been expended upon a building not yet fully completed. It will have cost, therefore, before it is occupied, more than three times as much as the London Law Courts, and it is doubtful whether it will ever be the scene of one-third of the business which is transacted in them. It is further complained that the accommodation is insufficient and most inconveniently planned. So much space has been given to interior magnificence, to vast and endless corridors, to huge staircases, to inner halls and courtyards, that little room is left for the actual Courts and the adjoining chambers.

On the exterior of the Palace of Justice there is no need here to make any criticism. The building covers about eight acres. It is of the heavily ornate style which seems to be much followed in modern Italy. Almost every form of ornamentation has found a place somewhere on its massive walls; heads of oxen, heads of Minerva, wreaths, medallions, coats-of-arms, coats of mail, Greek designs, Renaissance scrolls, nothing seems to be wanting. There cannot in all that vast surface be as much as a square yard of stone which is not decorated. Artists and architects may very likely differ as to the æsthetic effect. The wonder, however, still remains as to how it came to cost so much money, a question only partly answered by the fact that, for some unknown reasons, the stone was all brought from Brescia. Signor Luzzatti, writing some time ago in the "Corriere della Sera," compared the history of the Palace of Justice with that of the Imprimerie Nationale in Paris, and attributed the disasters of both to much the same causes—first, the unwillingness of Governments to make a full confession to the public of their real, or more probable, cost when Parliamentary sanction is first asked for public works; secondly, the tendency of contracts, when once their original limit has been exceeded, to increase enormously on the side of expenditure; thirdly, the unsatisfactory control exercised by Ministers who succeed to half-finished works without succeeding to the responsibility for them. What will be the ultimate cost of the huge monument that is slowly rising to the memory of Victor Emmanuel it would be difficult to estimate. But in the case of the monument there was naturally no question of utility or economy, whereas in the case of the Palace of Justice there should have been question of nothing else.

WHITGIFT HOSPITAL SAVED.

A statutory special meeting of the Croydon Borough Council, required in connection with the promotion of a Bill in Parliament for powers to widen North End under the scheme which threatens Whitgift Hospital with demolition, was held on November 27th. Letters opposing the scheme were sent by the Woolwich Antiquarian Society, the Surrey Archæological Society, and Canon Bromfield, who enclosed a resolution of the clergy of the rural deanery of Lambeth. The opponents of the proposal urged that apart from sentiment the town could not afford the enormous expenditure in the present depreciated condition of local property, and that the widening, even if shown necessary, could be accomplished by an alternative scheme leaving the hospital intact. They also declared that the representations of Church authorities and scientific societies in the Committee Room of the House of Commons—should proceedings get so far—would overwhelm the Council and mean a great waste



WHAT SCREEN IS THIS? A PRIZE OF ONE GUINEA FOR A CORRECT REPLY.

This illustration of a carved church screen we have had by us for some time, but lack the necessary particulars which would enable us to publish it in the ordinary way. We have therefore decided to offer a prize of One Guinea to the *sender of the first-opened reply which correctly states, with proof, in what church it is situated.* All letters must be marked "Screen" on the left hand top corner of the envelope, and addressed to The Editor of "The Builders' Journal," Caxton House, Westminster. They will be opened in the same order as received. Letters from Country readers arriving by first post in the morning will be counted as arriving the previous day. The Editor's decision must be regarded as final and binding on all competitors.

of the Croydon ratepayers' money. Many speakers predicted the decisive defeat of the scheme in the event of a poll of the borough. Mr. J. O. Pelton, on the authority of one of its members, said that the Royal Commission on Ancient Monuments had virtually scheduled the hospital as being most worthy of preservation, and he was sure, therefore, that no Parliamentary Committee would assent to its destruction.

The supporters of the proposition alleged that the alternative scheme would cost £60,000 more, and then not wholly meet the difficulty. Alderman Barrow, the chief speaker in favour of the resolution, said that North End at this point was the same narrow width now as in 1861, and dwelt on the bad feeling caused by the vexatious delays of trams and other vehicles. Mr Stapleton, upon the same side, urged that while a great deal had been heard of the opposition of outside societies, none had definitely offered to contribute anything towards the alternative scheme for saving the hospital. On a division twenty-five voted for the scheme and twenty-nine against it. The result was received with loud applause by a large gathering of opponents of the scheme, which is, therefore, for the time being, entirely defeated, and may not be expected to appear again in the same form.

Commenting on this decision a writer in the "Evening Standard" remarks: The Croydon Borough Council are to be congratulated on their decision to spare Whitgift Hospital—even though the proposal for its destruction was only defeated by four votes. It is to be hoped that this particular scheme of "improvement" will not appear again. It is, of course, possible to exaggerate the sentiment that clings at all costs to ancient buildings, but it is a form of exaggeration which certainly does not appear too often in this country. The tendency is still far too much the other way, in spite of archæological societies and others. An eminent architect has said that there is always a feasible way of avoiding the destruction of a valuable building. What is not always present is the good will. It should not be forgotten that our store of historical buildings is a small one compared to that of countries which have not suffered so much as we have from the modern jerry-builder. Even at the cost of a little inconvenience, which can probably be overcome, we must maintain our heritage: the future generations will demand it of us.

Coming Events.

Wednesday, December 1.

Institute of Sanitary Engineers.—Mr. Richard Horton on "Petrol Air Gas Lighting," 8 p.m.

Friday, December 3.

Institution of Mechanical Engineers,—Extra meeting. Resumed discussion on Mr. H. A. Humphreys' paper: "An internal-combustion pump, and other applications of a new principle," 8 p.m.

Monday, December 6.

Liverpool Architectural Society.—Mr. C. H. B. Quennell, F.R.I.B.A., on "The Development of Suburban Estates."

Tuesday, December 7.

Ancient Architecture Lectures at the British Museum.—Mr. Banister Fletcher's 10th paper, "Origin and Evolution of the Ionic Order," 4 p.m.

Institute of Sanitary Engineers.—Students' Meeting. Mr. A. J. Martin, M.Inst.C.E., on "Sewage Disposal," 7 p.m.

Wednesday, December 8.

Northern Architectural Association, Newcastle.—Council Meeting, 7 p.m. Ordinary Meeting: Mr. John W. Simpson, F.R.I.B.A., will read a paper, 7.30 p.m.

Royal Sanitary Institute, 90, Buckingham Palace Road, S.W.—Discussion on "The Collection and Disposal of House Refuse," opened by Mr. John S. Brodie, Borough Engineer, Blackpool, 8 p.m.

Manchester Society of Architects.—Mr. Henry Wilson on "Workmanship."

Friday, December 10.

Architectural Association.—Mr. F. C. Eden, on "Varallo, Orta, and Varese," 7.30 p.m.

Monday, December 13.

R.I.B.A.—Professor A. D. F. Hamlin, on "Architectural Education in America," 8 p.m.

Tuesday, December 14.

National Federation of Building Trade Employers.—Meeting of Administrative and Journal Committee.

Ancient Architecture Lectures at the British Museum.—Mr. Banister Fletcher's 11th paper, "Origin and Evolution of the Corinthian Order," 4.30 p.m.

Institute of Sanitary Engineers.—Students' Meeting. Mr. Geo. W. Chilvers, M.R.San.I., on "Practical Heating and Hot Water Supply to Buildings," 7 p.m.

The Trades' Training School, of 153, Great Titchfield Street, W. Presentation of prizes at the Carpenters' Hall, London Wall, by the Duke of Argyll, K.T., etc. 8 p.m.

Monday, December 20.

Lancashire, Cheshire and North Wales Building Trades' Employers' Federation.—Half-yearly meeting at Liverpool.

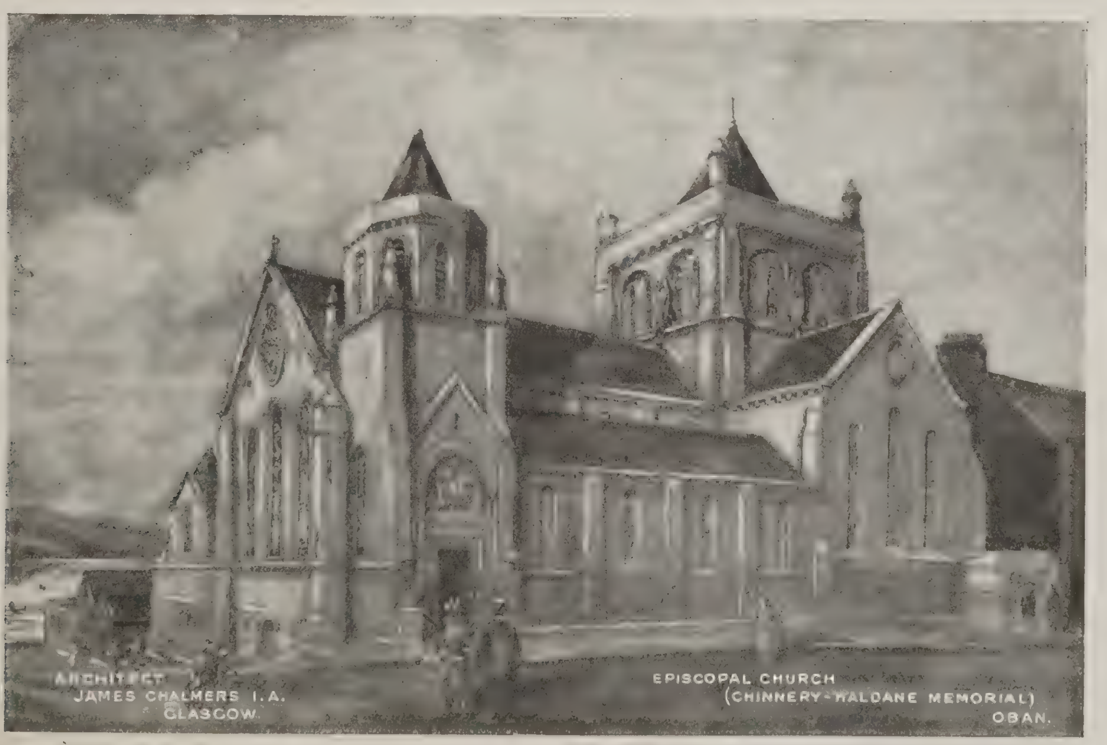
Tuesday, December 21.

Ancient Architecture Lectures at the British Museum.—Mr. Banister Fletcher's 12th paper. Seventh and concluding lecture on "Greek Architecture." End of Michaelmas term. 4.30 p.m.

Trade and Craft.

Doloment Patent Jointless Flooring.

The British Doloment Co., Ltd., Caxton House, Westminster, have forwarded for notice a revised edition of their catalogue, which is well illustrated, mainly with views of important buildings, in which Doloment has been or is being used. Doloment is laid ⅞-in. thick, in a double layer, which system enables the firm to give an absolute guarantee against cracking or bulging. It may be laid to greater thicknesses if required. Being elastic, non-absorbent, and



"Scottish Chronicle."

CHURCH OF ST. JOHN THE DIVINE, OBAN. JAMES CHALMERS, I.A., ARCHITECT.

This church, which is being erected as a memorial to the late Dr. Chinnery-Haldane, sometime Bishop of Argyll and the Isles. The main features are the octagonal baptistry, the south gable (60 ft, high), the belfry tower, the lantern tower (130 ft. high), and the transept. The stone is from St. Bee's Red-stone Quarry, Whitehaven, and the slates will be olive green. The architect is Mr. James Chalmers, I.A., of Glasgow. The contractors are as follows: for the mason work, Mr. Elphinstone Forrest, of Glasgow; joiner work, Messrs. Garvie and Son, Aberdeen; plumber work, Mr. Crawford, Oban; slater work, Mr. Jameson, Oban.

"*Scottish Chronicle.*"

CHURCH OF ST. JOHN THE DIVINE, OBAN. JAMES CHALMERS, I.A., ARCHITECT.

The interior of this church is of St. Bee's red-stone, and the barrel-vaulted roof will be of African mahogany, without staining. The architect's suggestion is that the whole east end shall be appropriated to the altar, carrying the reredos, with carved canopy more than 30 ft. high, which is in memory of the late Bishop Chinnery-Haldane.

non-inflammable, Doloment is greatly in demand for hospitals, schools, and public buildings. A long list of the buildings in which, or authorities by whom, the material has been specified includes Government Departments and Corporations, hospitals, and infirmaries, libraries and schools, banks, clubs, and hotels, industrial works, etc. There are also imposing lists of eminent architects who have specified, and of important building firms that have employed Doloment, as well as some most convincing testimonials as to its merits. It is applied to floors and walls without a single join, and can be finished in many colours and designs, to imitate granite, mosaic, or marble.

The "Cable" System of Heating.

Before deciding upon the method of heating large buildings, architects should obtain schemes on the Cable system (low-pressure hot water). This system will save excavating heating chambers, ducts and channels. The pipes may be carried in any direction absolutely independent of levels, and are considerably smaller than any other system. Messrs. J. F. Phillips and Son, of 21, Old Queen Street, Westminster, S.W., and of Brighton and Liverpool, who are the licensees for the Cable system, have in hand the following installations, viz.: Westmeston Place, Hassocks, the residence of Colonel Money; Sandhills, Sletchingley, Surrey, the residence of Captain Walsh; Royal Portsmouth Hospital, Nurses' Home, this being the second installation on the system at this hospital; Messrs. Pratt Bros., extensive premises, High Road, Streatham; St. Luke's Church, Battersea; Orchard Street Schools, Chichester, etc. The system is specially advantageous in hospitals, asylums, schools, public buildings and large private mansions.

Federation News.

BIRMINGHAM ASSOCIATION.

Secretary: G. Henry Wright.

The annual meeting of the Birmingham Building Trades Employers' Association was held at the Grand Hotel on November 11th. Mr. F. G. Whittall presided.

In the annual report, the committee recorded with regret the fact that, in common with most industries in the city, the building trade during the past year had been in a very depressed condition, and there was at the present time no sign of a revival. As a result of notices served on the operatives, uniformity of working hours in all trades had been secured. As a result of the adoption of the inter-trading rule, there had been a large increase in the membership, which now was 140, against 84 at the end of last year. The committee also reported with regret that Mr. E. J. Bigwood, who had been their secretary for twenty-five years, had found it necessary to resign his office, owing to increasing pressure of other business. He left the work of the association with the abiding goodwill and wishes of all its members for his future welfare. The balance-sheet showed the ordinary receipts for the year had been £241 19s. 10d., which, with the balance from last year, made a total of £268 0s. 5d. The various disbursements had been £222 16s. 11d., leaving a balance in hand of £45 3s. 6d.

Mr. F. G. Whittall, in proposing the adoption of the report, said he had a feeling that in their deplorable experience of bad trade they had at last touched bottom, and he hoped they would next year have to record not only a very satisfactory improvement, but a boom. The year was notable as having seen the achievement of a uniform set of working rules among all the operatives in the trade, particularly with reference to starting and leaving off work. The difficulties had been overcome by the conciliatory attitude of all parties to the arrangement. The masters had secured the uniformity they wanted, while the operatives had attained their end of shorter hours of work. He announced the council had appointed as secretary Mr. G. Henry Wright, of the Chamber of Commerce. The report was adopted.

The following officers were elected:—President, Mr. Ralph Webb; senior vice-president, Mr. W. Moffat; junior vice-president, Mr. G. Elvins; treasurer, Mr. George Twigg.

At the close of the meeting, Mr. Whittall presented to Mr. Bigwood a handsome mahogany-cased chiming clock in recognition of his devoted services to the association during twenty-five years. Mr. A. S. Smith handed to Mr. Bigwood a decorated address recording the members' high appreciation of his assistance to the association.

Mr. Ralph Webb presided at the annual dinner of the association held at the Grand Hotel on November 11th. There was a large gathering, those present including the Lord Mayor (Councillor Bowater), Mr. W. Moffat, Mr. A. S. Dixon (president Birmingham Architectural Association), Mr. John L. Williams, Mr. F. G. Whittall, Mr. Ernest J. Brown (president National Federation), Mr. H. Smith (president Midland Federation), and Mr. G. Elvins.

The toast of "Success to the Birmingham Building Trades Employers' Association and the trade of the city" was proposed by the Lord Mayor, who said that no industry had felt the depression in trade more acutely than had the building and allied trades, but they were not met that night at the funeral of the trade. That and other trades had previously experienced periods of depression and had emerged from them. The builders had, he noticed, admitted into their association members of the allied trades. That would strengthen the foundations of the society, but it must also be a great advantage to the subsidiary trades. He observed that whenever the City Council accepted a tender from a firm outside Birmingham there was always a great outcry, but if it were the custom of all local authorities to confine their work to local men, it would be to the very great loss of so splendidly developed a trade as the building trade of Birmingham, for the local builders obtained more work outside the city than the outside men obtained in Birmingham. Some of them might regret that a Birmingham firm had not obtained the contract for the Council House extension, but an outsider tendered lower than any firm in the city, and in all fairness the Council had to accept the lowest contract.

The President (Mr. R. Webb), who responded to the toast, was sorry that they could not report any improvement in the building trade in any part of the country. Their trade was the first to feel any depression, and the last to feel the benefit of any improvement in trade generally. Builders made matters worse for themselves by the insane cutting of prices. At present work was being taken at rates which could not leave any margin of profit, and, in fact, must entail serious loss. The men in most branches of the trade were again "on the rampage," for they had given notices partly for an increase in wages and partly for alterations in working rules, so he supposed the trade would again experience a troublous time for a few months.

Mr. W. Moffat, who proposed "The Architects and Surveyors," expressed regret that the contract for the Council House extension had gone out of the city.

The toast was responded to by Mr. A. S. Dixon and Mr. J. L. Williams. Mr. F. G.

Whittall proposed, and Messrs. E. J. Brown and H. Smith replied to, the toast of "Kindred Associations," and the health of "The Visitors" was proposed by Mr. G. Elvins.

LONDON MASTER BUILDERS' ASSOCIATION.

Secretary: T. Costigan.

The ordinary monthly council meeting of the London Master Builders' Association was held on Thursday, November 18th, when the president (Mr. F. G. Rice) occupied the chair.

The meeting was of a lengthy and discursive character, and was protracted till quite a late hour.

After reading the minutes of the ordinary Council meeting held on October 21st, and of the special Council meeting on November 4th, the Council proceeded to consider a long and important agenda.

The question of a builder who is appealing against the decision of an arbitrator was considered. The opinion of counsel was read, and a certain course of action decided upon.

On the report of the proceedings of the Organisation Committee, a long discussion took place as to the eligibility of sub-contractors for associate membership, the same firm frequently trading both as builders' merchants and as sub-contractors, specified by architects, and therefore exposed to the same attacks as the master builder himself. Under such circumstances, it was considered hardly fair for the builder to have to do all the fighting in the event of a trade dispute, while the sub-contractor could stand aloof and even extend his operations.

It was proposed by some that those who are likely to compete with the builder should give an undertaking to take the same chance as he does, and support him in case of need. It is well known, they said, how much disorganisation is caused by some sub-contractors. They treat the builder as of no account, use his plant, and, indeed, ride roughshod over him, while the enduring builder has to bear all his annoyances without satisfaction to his general operations, and with little or no profit.

After remarks by Messrs. F. Higgs, J. Carmichael, Wr. Laurence, jun., Ernest J. Brown, W. F. Wallis, Frank May, Col. G. Howard Trollope, and F. L. Dove, the Council agreed that those firms who are specified by architects to carry out work usually done by the building contractor, be considered sub-contractors.

One firm was elected as ordinary member —Messrs. R. Woollaston and Co., Limehouse—and 68 were elected as associate members.

The president produced his draft of the addition to the History of the Association, to be given in the 1910 "Diary and Handbook," and the Council approved it.

The question of a trade paper being issued free to every ordinary member of the Association was considered and referred to the Finance Committee for report.

WIGAN AND DISTRICT ASSOCIATION:

Secretary: Robert Hollows, A.C.A.

The annual meeting of the Wigan Association was held on Thursday, November 18th, at the Clarence Hotel, Wallgate, Wigan. Mr. William Webster (Messrs. Webster and Winstanley) presided over a good attendence of members.

The secretary (Mr. Robert Hollows) read the report for the past year, which recorded that at the commencement of the financial year an endeavour was made to come to some arrangement with the Operative Painters' Society respecting workmen on country jobs catching the early trains, but the matter fell through, the operatives' society not agreeing to our suggestions. This matter, however, has been dealt with in the notice of alterations to working rules, sent by this association to their society recently.

Cases of infringement of association rule 14 (non-members) were reported during the year numbering 3, which were dealt with by the Executive Committee. One member has been expelled from membership of the Association for non-compliance with the requisitions of the Executive Committee, and another firm has been expelled from membership for infringing rule 14.

Notice of alterations to the working rules of the Operative Carpenters and Joiners were received in October, 1908, and, after many meetings, new rules were drawn up and agreed upon, which came into operation on May 1st, 1909.

On May 23rd last, a dispute arose with the Operative Joiners' Society respecting the construction that should be placed on the working rules respecting the time that men working on outside jobs should be at the shop, some of the operatives ceasing work at such times as would enable them to be at the pay table at 12 noon on Saturdays, and the employers had rightly deducted a proportionate amount of wage. Meetings were held with their deputation on June 10th and 17th. At the general meeting of master joiners, held July 7th, it was agreed to refer the matter to arbitration, and after five weeks' wavering, during which the employers had to take the same stringent steps, the operatives' society agreed to lay the same before Mr. Henry Brierley, county court registrar, as umpire.

The arbitration was held on August 31st last, and the award came to hand on September 16th, when the matter went in favour of the employers. In his decision, Mr. Brierley had the concurrence of his Honour Judge Bradbury.

During the year forty-three meetings had been held, of which 12 have been executive meetings.

Two meetings have been held at Hindley to which the members of the trade were invited, and matters particularly affecting them were discussed, and the benefits to be derived from being members of an Association of this description were laid before them. Several persons joined, and it is hoped that more will follow, when more effective methods can be adopted to ensure fairer treatment to the employers in that district.

There have been notices of alterations of working rules sent in to the Operative Plumbers' and Operative Painters' Societies, and one has been received from the Operative Joiners' Society, to which a counter notice has been given.

The statement of accounts for thc past year were submitted by the treasurer, Mr. Oswald Pilling (Messrs Joseph Wilson and Co.), which were considered highly satisfactory, and were unanimously adopted.

The balance at the credit of revenue account, after taking into account the sum of £150 invested in Wigan Corporation stock, was £252 odd, and it has been decided to invest a further £100 in the same stock.

The following persons were elected officers for the ensuing year:—President, Mr. John Smith; vice-president, Mr. Oswald Pilling; treasurer, Mr. Robert G. Dawson; auditors, Messrs. Glover and Dickinson.

The matter of the "Builders' Journal" was brought before the meeting and fully explained, and its value as a business paper laid before the members. The arrangements in regard thereto, made by other associations and their members were also mentioned. After discussion, it was resolved that the matter be left to the discretion of each member.

The annual dinner was fixed for Tuesday, December 7th, and a sub-committee was appointed to make the necessary arrangements. In regard to the notice of alteration to working rules, received from the Operative Carpenters' and Joiners Society (particulars of which were reported in the "Builders' Journal," of November 17th), a counter notice has been forwarded, which embodies the following alterations in the present rules:—Working hours in summer months increased from 49½ to 54½, and in the winter months reduced form 44 to 41½ per week. Rate of wages decreased from 9d. per hour to 8½d. all the year round. A variation has been made in the rate of overtime pay, and the times of commencement of such overtime rates, and the following additions have been demanded: "Where wages are paid on the job, the workmen shall continue work until the leaving off times as per rules both on country and outside jobs. If wages are not paid on the job, men working within a mile and a half from the shop shall work until the leaving off times as stated in the rules, and then proceed to the shop for their wages. The "Boundary" in the starting time rule has been increased from one mile to a mile and a half, and the clause relating to protection from the weather, when working in a building with artificial light, has been eliminated. The rule relating to the outside jobs has been eliminated. This rule allows a workman on outside work (within a mile and a half from the shop) to resume work, should the weather prove inclement.

The "country jobs" rule has been amended as follows:—The workmen on these jobs are to work on Saturdays up to 12 noon, and not up to such times as will allow of their being at the shop at that time. The present rule relating to the "Discharge of Men," has been eliminated, and the corresponding rule of the Bury Association has been added. The new rule reads as follows:—"That each employer, previous to discharging a workman, shall give him one hour's notice, or in default shall pay him one hour's wage; any workman leaving his employment shall give similar notice or forfeit similar wage. This rule to apply only to workmen who have been employed at least one full working week before notice is given, and shall not apply in case of neglect, incompetence, or dishonesty. This notice is for enabling a workman to get his tools in order, and must be devoted to that purpose, otherwise he must continue work until expiration of notice." The rule stating that the employer shall provide hot water for meals and lock-up places for tools, has been eliminated, and that relating to the authority of employers has been strengthened by eliminating the word "not infringing the individual liberty of the workman."

The clause peculiar to the Wigan rules, relating to no ready-made or imported woodwork in the shape of windows, doors, and other framework, being allowed to be fixed by the operatives unless the same be prepared by the contractor himself, or at least within five miles of the Wigan Market Place, has been eliminated. The present rules also allow a workman to do work at night for outside parties, if he does not do the same "systematically," but in the counter notice the word "systematically" has been eliminated, which will exclude workmen from doing work for outside parties in their own time.

The present rules contain a clause limiting apprentices to one boy to every two workmen. This limitation was included in the rules for the first time last May. The counter-notice now demands no limitation whatever.

The Conciliation rule has been amplified by adding the following, in the event of the Board not agreeing at the conference:—"failing which, it shall be referred to the judge at the Wigan County Court, or any person he may appoint, whose decision shall be final and binding." The arbitration rule has been amended, in that an arbitrator may be called upon to settle the matter by February 22nd, instead of March 22nd, and his award must be received by March 22nd, instead of April 22nd, the new rules to come into force on May 1st next ensuing.

Yorkshire Federation.

The monthly meeting of the Executive Council of the Yorkshire Federation was held at the Great Bull Hotel, Wakefield, on Thursday, November 18th. Mr. W. R. Thompson (president) occupied the chair, and was supported by 42 delegates from the affiliated associations.

The minutes of last meeting were read and approved. Apologies for absence were reported from the Right Hon. the Lord Mayor of York (Alderman J. Birch), Alderman W. H. Jessop, J.P., and Councillor J. W. Mallinson (Huddersfield), and Mr. G. E. Powell (Sheffield).

The President reported that a letter of sympathy and condolence had been forwarded to Mr. James Storrs, J.P., of Stalybridge, conveying an expression of the deep regret and sincere sympathy of the members of the Federation with him and his family in the loss which they had sustained in the sudden and sad death of his brother.

The treasurer reported receipt of the following amounts since the last meeting:—Reserved fund, £27 10s.; subscriptions, £19 10s. 6d.; transfer from insurance account, £24 16s. 1d; total, £71 16s. 7d. The Finance Committee reported that they had examined the accounts and recommended payment. It was resolved, on the motion of Mr. W. T. Ledgard, seconded by Mr. A. J. Forsdike, that the following accounts, having been examined and certified as correct, be approved, and that cheques be drawn in payment thereof, as follows:—National Federation, balance of subscription, £55 6s. 8d.; National Federation, reserve fund on account, £142 2s. 6d.; delegates' travelling expenses, £19 15s.; secretary's account for quarter, £21 18s. 10d.; total £239 3s.

The Finance Committee reported that arrangements had been made for the joint tenancy by the Federation, the Leeds M.B.A., and secretary, of offices in West Bar Chambers, Boar Lane, Leeds, within two minutes' walk of the Midland station. On the motion of Mr. A. J. Forsdike, seconded by Councillor W. G. England, J.P., the action of the Finance and Emergency Committee was approved and confirmed; and they were authorised to arrange with the Leeds Association as to apportionment of increased cost, and report.

The Finance Committee reported that they had considered the expediency of discontinuing the issue of duplicated copies of the monthly proceedings of the Federation, in view of the full reports which were now issued in the "Builders' Journal." On the motion of Mr. P. Rhodes, seconded by Mr. A. J. Forsdike, it was resolved, in view of the possibility of important matters being considered by the Federation, and the inexpediency of the discussion and decision being publicly circulated, that the issue of duplicated copies of the minutes be continued for the present.

The observations of the Wakefield, Dewsbury, Hull, and York Associations, on the sub-contract form recently submitted to local associations, were read and considered. On the motion of Mr. P. Rhodes, seconded by Mr. E. Quibell, the observations were referred to the Finance and Emergency Committee for consideration and report.

It was reported that the Federation secretary had been favoured with an interview with the architect and trustees in reference to a dispute with a Dewsbury member. The extras claimed amounted to £37 6s. 3d. The architect only allowed in his final certificate £10 16s. 6d., leaving a balance of £26 9s. 9d. As a result of the representations of the joiner and Federation, it was mutually agreed to close the matter by payment of a further sum of £17 4s. The architect stated that the reason for his not including a larger sum in the final certificate was that the extras had been charged above contract price. The attention of the trustees had been particularly drawn to the total inadequacy of this reason, as the amount certified only represented 29 per cent. of the joiner's claim.

Attention was again drawn to the absolute necessity of the strict compliance of members with the Federation's request that the adoption of the National form of contract should be urged in all cases, and not to sign any contract by which the member guarantees the accuracy of the quantities, and which does not contain at the least an independent arbitration clause.

It was reported that the National Federation were considering the expediency of some standard conditions under which tenders should be sent in, and invited the suggestions of the Federation. The matter was discussed and several points were raised. On the motion of Mr. P. Rhodes, seconded by Councillor W. G. England, J.P., it was resolved that the points now suggested be submitted to the National Federation for their consideration.

The notices of the operative societies for amendment of the conciliation rules were presented. Local associations were requested, on the motion of Mr. E. Quibell, seconded by Mr. A. J. Forsdike, to take the notices into careful consideration, and favour the Federation with their observations at the earliest possible date, with a view to the matter being considered by the Finance and Emergency Committee.

It was reported that a meeting of the National Administrative Committee would be held in London, on Tuesday, December 14th, at 2.30 p.m. On the motion of Mr. J. Dawson, seconded by Mr. G. Rayner, it was resolved to request the National Administrative Committee to consider:—(a) the expediency of discussion at the National meetings on matters of considerable trade importance, such as Labour Exchanges, Unemployment Insurance, etc.; (b) the appointment of permanent official medical referees to examine cases which arise under the Workmen's Compensation Act, and whose decisions on physical capacity shall be final; (c) representations being made to the medical societies to obtain the use of simple language on medical certificates.

Attention was drawn to the fact that it would probably soon be the turn of the Yorkshire Federation to have a representative appointed as junior auditor for the National Federation. On the motion of Mr. A. J. Forsdike, seconded by Mr. J. Biggin, the President was requested to obtain an expression of opinion from the National Administrative Committee as to when it is likely that Yorkshire will have the opportunity of being honoured with a representative being appointed as junior auditor; and the committee be informed, when it is open to a Yorkshire representative, that the Federation strongly and unanimously submits the name and urges the claims of Mr. A. W. Sinclair, of Scarborough, for such position.

The appointment of officers and committees for the ensuing year was considered, and the following nominations were approved for submission at the annual meeting:—President, Coun. W. G. England, J.P., Barnsley; senior vice-president, Mr. A. J. Forsdike, Sheffield; junior vice-president, Mr. J. Townsley, Hull; treasurer, Mr. W. T. Ledgard, Leeds; administrative committee, Coun. W. G. England, J.P., Barnsley. Finance and Emergency Committee:— President, two Vice-Presidents, Treasurer, Councillor Mallinson, Messrs. A. Moulson, W. R. Thompson, and W. E. Biscomb. National Federation and Northern Centre (5):—President, Messrs. A. J. Forsdike, W. T. Ledgard, W. R. Thompson and A. W. Sinclair, with Mr. P. Rhodes as reserve in the event of a vacancy arising. National Conciliation Board (3):—President, and Messrs. A. J. Forsdike and A. W. Sinclair. Northern Centre Conciliation Board (4):—President, and Messrs. A. J. Forsdike, W. R. Thompson, and R. Finch.

Further nominations may be made, but must, in accordance with the resolution of the Council, reach the Federation Secretary not later than December 2nd.

On the motion of Councillor G. Haigh, seconded by Mr. J. Biggin, the arrangements for the annual dinner were referred to the officers of the Federation, with power to add to their number.

On the motion of Mr. E. Quibell, seconded by Mr. R. Finch, the local associations were recommended to take into consideration the expediency of keeping a register of accidents for reference of members when engaging workmen.

Mr. J. H. Tomlinson invited the Federation to hold the annual meeting in Leeds, and it was resolved to accept the invitation, and to hold the meeting on Thursday, December 16th.

The Council were afterwards entertained to tea by the President and members of the Wakefield Association, to whom a hearty vote of thanks was accorded for their generous hospitality.—J. DAVIDSON, Secretary.

TO CONTRIBUTORS.

Owing to the very large number of voluntary contributions submitted to the Editor, it has been found desirable to make the following regulations:—

1.—Intending contributors are advised to send a preliminary letter before forwarding articles and illustrations. The non-receipt of a reply within one week is to be taken as a polite negative. MSS. and drawings in all cases should be accompanied by sufficient stamps to cover return postage.

2.—The Editor declines to take any responsibility for the safety or return of contributions submitted, although every care will be taken where these regulations are complied with.

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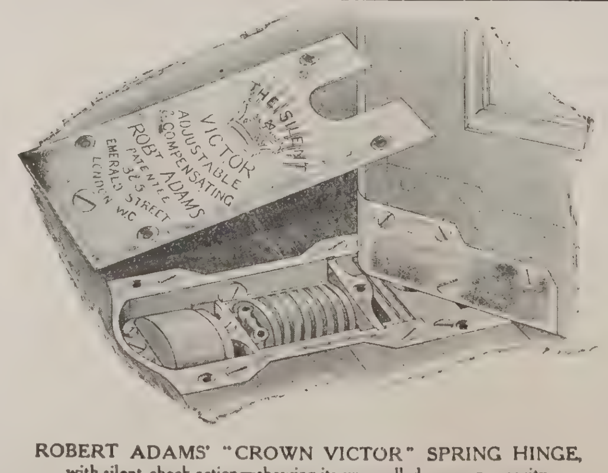

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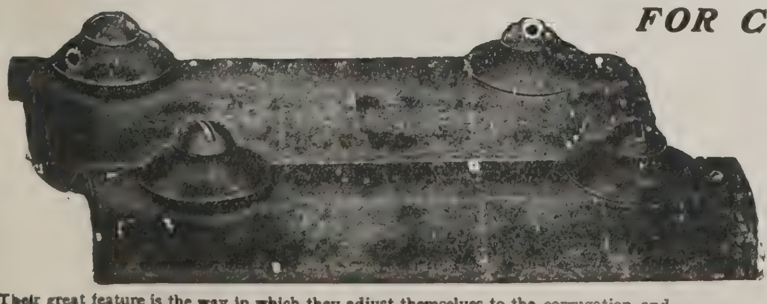

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Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Barry Dock (Wales).—For the erection of a Wesleyan chapel at Barry Dock, for the trustees. Mr. Henry Budgen, F.R.I.B.A., architect, 96, St. Mary Street, Cardiff.

A. S. Morgan and Co., Ltd., Newport	£5,176	0	0
W. H. Evans	5,093	0	0
W. Thomas and Co.	5,063	0	0
T. Bevan, Penarth	5,055	0	0
G. Beames	4,994	0	0
W. T. Morgan	4,973	0	0
D. Davies and Sons	4,950	0	0
W. Britton, Barry	4,781	0	0
D. W. Davies and Howell	4,600	0	0
H. S. Rendell, Barry	4,432	8	8
Lloyd and Tape,* Barry Dock	4,393	11	6

Rest of Cardiff.

*Accepted.

London, N.—For renovations and sanitary work at St. Padarn's Welsh Church, Gloucester Road, Holloway, N., for the Church Council. Mr. G. H. Luetchford, architect and surveyor, 122, London Wall, and 16, Beaumont Road. Quantities supplied.

W. J. King	£1,035	3	0
W. C. Pepper (too late)	983	0	0
Ashby Bros.	970	0	0
Bates Bros.	965	7	6
Roberts	935	0	0
Rhys and Davies*	892	10	0

Architect's estimate, £997 14s.

* Accepted.

London, W.—For making up the extension of Oxford Gardens as a "new street," for the Kensington Royal Borough Council.

W. Shepherd and Sons	£1,532	7	4
G. Wimpey and Co.	1,385	0	0
J. Mears	1,350	0	0
E. Rogers and Co.	1,323	0	0
W. Griffiths and Co., Ltd.	1,299	0	0
J. Mowlem and Co., Ltd.	1,229	0	0
E. T. Daley and Son	1,151	10	0
J. Latter*	1,123	2	4

*Recommended for acceptance.

Mountain Ash (Wales).—For erection of a higher standard mixed school, to accommodate 160 scholars, with laboratory, manual instruction centre, offices, and boundary walls, at Miskin, Mountain Ash, for the Mountain Ash Education Committee. Mr. W. H. Williams, architect, Town Hall, Mountain Ash.

J. H. Maggs and Co.	£5,169	12	0
T. F. Howells	4,908	6	6
A. R. John, Mountain Ash	4,583	3	4
Knox and Wells	4,545	0	0
S. Shail, Llandaff	4,508	0	0
W. H. Evans	4,430	15	8
D. Davies and Sons	4,370	0	0
T. W. Davies, Mountain Ash	4,300	0	0
Jones Bros.,* Quaker's Yard	4,260	0	0

Rest of Cardiff.

*Accepted.

Narborough (Leics.).—For the construction of about 1,000 lineal yards of 9in. and 350 lineal yards of 6in. stoneware pipe sewers, together with the necessary manholes, etc., in the parish of Narborough, for the Blaby Rural District Council. Mr. Jas. Turner, engineer, South Wigston.

H. Law, Birmingham	£848	0	0
O. Wright and Co., South Wigston	834	18	3
Wickstead and Co., London	737	4	[illegible]
Hutchinson and Son, Leicester	725	0	0
Southam and Son, Wigston	699	0	0
Dix and Co., Coventry	695	0	0
A. Palmer, Leicester	689	2	0
W. Webster, Guilsborough	689	0	0
H. E. Buckley,* Bradford	679	13	9
Stimpson and Rollston, Leicester	679	0	0
A. Macdonald, Cardiff	595	0	0

*Accepted.

Newtonmore (Inverness).—Accepted tenders for additions to Craigmhor Hotel, and for removal of old buildings. Mr. Alex. Cattanach, architect, Kingussie.

J. and D. McDonald, Newtonmore, masons	£395
D. and N. Fraser, joiners	585
A. Cattanach, plumber	250
J. Reid, Iinverness, slater	40
R. and L. McPherson, plasterers	215
Dunbar and McPherson, painters	90

Rest of Kingussie.

Richmond (Surrey).—Accepted for contract No. 1, the construction of filter beds, mainlaying and other works in connection therewith at Petersham, Surrey, for the Richmond Town Council:—

Monro and Co., 3, Chichester Rents, Chancery Lane, London, £3,592.

(*Tenders continued on page viii.*)

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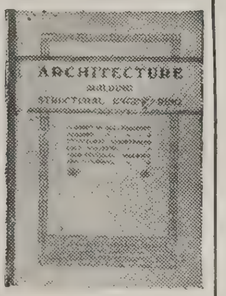

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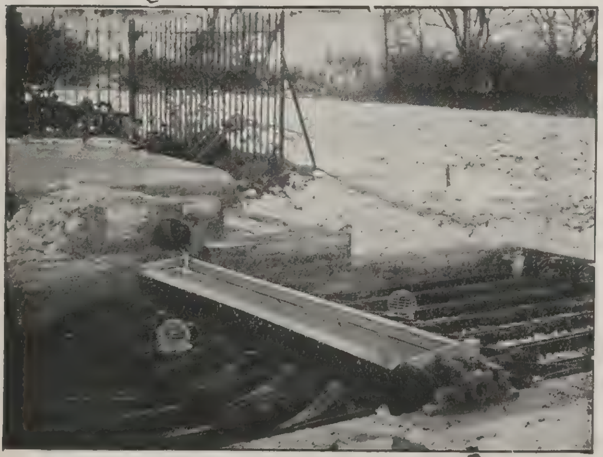

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(Tenders continued from page vi.)

Fleet.—For the Fleet Road International Stores, Fleet. Messrs. George Baines and Son, architects, 5, Clements Inn, Strand, London, W.C.

	Estimate "A."	Estimate "B."
H. Charman ...	£1,639 0 0	£568 0 0
J. J. Wise ...	1,590 0 0	560 0 0
Duncan, Stewart and Son	1,609 0 0	519 0 0
F. G. Minter ...	1,498 0 0	600 0 0
Battlay, Sons and Holness	1,541 0 0	476 0 0
Mussellwhite and Sapp	1,448 0 0	535 0 0
H. J. Carter ...	1,490 0 0	475 0 0
Pool and Sons ...	1,456 0 2	459 19 8
J. Horsell ...	1,512 0 0	397 0 0
Jas. Wm. Jerram	1,393 0 0	509 0 0
Walter Wallis, Ltd.	1,420 0 0	470 0 0
G. Kemp and Co.*	1,389 0 0	498 0 0

*Accepted.

Newtonmore (Inverness).—For erecting a house, for Mrs. E. Garrett Anderson, M.D., Aldeburgh, Suffolk.

A. Cattanach, £750.

Rhosesmor (Holywell).—For erection of a new chapel and school-room, etc., at the Rhosesmor Welsh C.M. Church. Messrs. R. Owen and Son, architects, Westminster Chambers, Crosshall Street, Liverpool.

J. Hayes, Abbey Foregate, Shrewsbury	£3,490 0 0
Sibeon Bros., Holywell	3,333 0 0
A. B. Lloyd, Flint	2,700 0 0
R. Williams, Brymbo, Wrexham	2,371 9 3
R. Jones and Sons, Holywell ...	2,100 0 0
M. S. Rogers,* Flint ...	1,770 0 0

*Accepted.

Romford.—For erection of iron buildings as cells, for stonebreaking, for the Board of Guardians.

Murphy and Co., Catford ...	£530 0 0
H. and S. Jones, West Brompton	317 10 0
Haward Bros., Ltd., Waltham Cross	315 0 0
F. Smith and Co., Stratford ...	312 10 0
Wilmer and Son, St. Mary Axe	300 0 0
Wood Bros., Forest Gate ...	255 10 0
W. Whitford and Co., Millwall	213 0 0
General Iron Foundry Co., Ltd. 43, Upper Thames Street, E.C.	212 0 0
Norton Bros., Ilford	211 0 0
Pierson and Co., Great Tower Street	198 0 0
H. J. Savill, Waltham Cross ...	175 0 0
Alnwick Foundry and Engineering Co.,* 52, Queen Victoria Street	165 10 0

*Accepted.

Southampton.—For the Southampton East Street Baptist Church and Schools. Messrs. Geo. Baines and Sons, architects, 5, Clements Inn, Strand, W.C.

	Estimate "A."	Estimate. "B."
Lawrence Walter and Son ...	£7,150	£730
C. Barter	7,000	750
Golding and Ansell	6,950	700
Wright, A., and Son	6,903	652
Henry Cawte	6,893	630
H. Stevens and Co. ...	6,845	679
F. G. Minter	6,842	673
J. J. Udall and Co., Ltd. ...	6,840	639
Dyer and Sons	6,789	660
Jenkins and Sons, Ltd. ...	6,564	626
Jas. Wm. Jerram	6,189	590
John Nichol*	6,178	560

*Accepted with modifications.

Stapleford.—For the erection of a pork shop, foreign meat shop, etc., etc., Nottingham Road, Stapleford. Walter H. Woods, M.S.I., architect, High Street, Long Eaton, near Nottingham. Quantities by the architect.

John Moult, Balford Road, Stapleford	£405
Frank Martin,* Bailey Street, Stapleford	369
Perks and Son, Ltd., Bridge Street, Long Eaton	360
R. J. Warren, Oxford Street, Long Eaton	350

*Accepted.

Toddington (Beds.).—Accepted for erection of new school at Toddington, for the Bedfordshire Education Committee:—

O. P. Drever, Kettering, £1,707 17s.

Wolstanton (Staffs.).—For erecting a residence, for Mr. Leonard Arrowsmith, Mr. Reginald T. Longden, architect, Market Place, Burslem and Leek.

J. H. Broadhurst and Son ...	£1,125 0 0
W. Grant and Sons	1,100 0 0
H. Wardle	1,073 10 0
G. M. Sambrook	1,000 0 0
W. Cooke	1,024 0 0
S. Wilton	983 0 0
W. Thomas and Sons ...	963 0 0
J. Cooke,* Wolstanton	960 0 0
J. Cummings	896 0 0

*Provisionally accepted.

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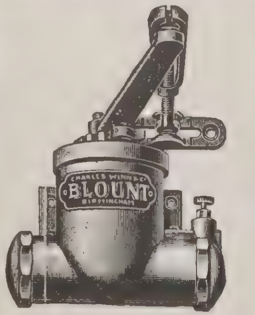

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The Cinderella of the Arts.

A Scottish architect, in the course of an address entitled "The Critical Study of Architecture," delivered before the Royal Philosophical Society of Glasgow, revived the old complaint that "while the merits or defects of the drama, music, books, and pictures, are discussed and criticised in the newspapers, architecture receives no such recognition." It is seldom, he adds, truly enough, that an intelligent criticism of a modern building appears in the daily Press; and he thinks that, since the Press may be trusted to know what the public wants, the reason why the mother of all the arts is thus neglected is because the public feel no curiosity about architecture. The lecturer—he was Mr. Alexander Cullen, F.R.I.B.A., F.R.S.E.—went a step further, and declared that a certain measure of responsibility for this apathy rests with the architect, whose work fails to interest the public. Mr. Cullen's data are indisputable, but his inferences do not command our instant assent. For while it may be granted that architecture would do better if the public were less ignorant and apathetic, it may be doubted whether the architect has much power to compel their admiration of good work while they still love darkness rather than light. He can, and does, do much to elevate the public taste; but the conversion is very gradual, and depends very largely upon other means than those the architect controls. Then it occurs to us that, given a public fancying that it knew a great deal about architecture, the architect's last state would be worse than his first. Already the worst sort of client is the one who imbibes fads and freak notions from organs of the lay Press which dabble in architecture; and the great bulk of the alleged criticism of the drama, music, and pictures, that appears in the daily Press, does not encourage us to yearn for similar treatment of architecture. The conversion for which the architect should pray is almost purely spiritual. If "knowledge comes, but wisdom lingers," Crotchet Castle will be a fashionable model; but if our public will add to the many ideas borrowed from America that of placing implicit confidence in the knowledge and skill of the architect, the art will be emancipated from the thraldom by which at present it is debased and dejected. It seems to us, therefore, that the crux of the problem is not: How shall we educate the public? but: How shall we inspire them with the right spirit? By what means shall we win their trust and confidence? Education of a kind is doubtless one means towards a solution of the difficulty; but it is the education of the architect, rather than that of his client, that is our chief concern. When it is known and seen of all men that he is being trained upon right methods, and when, by reason of his status and influence, he is able to impress the public mind with a due sense of his importance to the community, then architecture will be in a fair way to come by its own. The Cinderella of the Arts will be recognised as a Princess as soon as she is fitted with the little glass slipper which the R.I.B.A. is understood to be preparing for her. We by no means despair of that happy consummation, and we must confess that our optimism was greatly encouraged by Mr. Ernest George's forecast, in his Presidential address, of a more liberal scheme of study, and of a closer approach to the educational ideals that have been so much more abundantly realised on the Continent and in America. The men we have; the method is still to seek.

The Town Planning Advisory Committee.

The Housing and Town Planning Bill having survived the strife of parties, the National Housing and Town Planning Council is setting to work in earnest to obtain skilled advice as to the practical application of the Bill's provisions. The Council has convened a conference on the subject to take place at the Westminster Palace Hotel on Tuesday and Wednesday, Dec. 14th and 15th, when a series of suggestions as to most practical lines of town planning procedure adapted to (a) great centres of population; (b) urban districts will be submitted as a basis for discussion. It is proposed to form a Town Planning Advisory Committee, on which nearly a score of gentlemen distinguished for expert knowledge of various phases of town planning have been specially invited to co-operate. The names include half-a-dozen Germans, and only one Frenchman—M. Augustin Rey, of Paris; and the British half-dozen or so architects invited are Professor S. D Adshead, Mr. E. M. Gibbs (Sheffield), Mr. Percy B. Houfton, Mr. Raymond Unwin, and Mr. Percy Scott Worthington—a list that might with advantage be considerably extended, as perhaps it will be when the committee is actually formed. That Germany is so largely represented is a tacit acknowledgment of the pre-eminence of that country in town planning, and there is no doubt that the practical experience of these gentlemen, if they can be induced to impart it, will be materially helpful in the necessary process of roughing out an initial policy. The Bill itself owes much to the example of Germany; and in studying how to apply its principles it would be the height of folly to ignore what has been done in that country. There is but little danger that we shall be mere copyists of these convenient German models, which will teach us what is for avoidance as well as what can be advantageously imitated or adapted to our own national needs and circumstances. It is, of course, with regard to town planning, rather than to housing, that we must look to Germany for instruction. If in German housing schemes there is found to be any superior feature, we shall at least have the consolation of knowing that it was from England that Germany got her first inspiration in this kind. Indeed, the Germans, although they may have improved considerably on our block buildings, have observed that that system is no longer in favour in this country, and are rather envious of our more recent forms of industrial dwellings This kind of international exchange is obviously beneficial all round, and therefore the mildly cosmopolitan character of the proposed Advisory Committee is one of the many hopeful signs that we are shaking off the shackles of insular prejudice.

Right Restoration (?)

The "right principles of church restoration" have been voluminously discussed by all sorts and conditions of men—nor is the cry of "votes for women" here callously disregarded—in the pages of the "Church Family Newspaper." Mr. A. C. Benson started the discussion with an exceedingly interesting article on the quaint old church of Cartmel Fell; and several architects of note have joined in it, including Mr. W. D. Caröe and Mr. P. Morley Horder. The former raises a point that has been considerably canvassed of late in another connection: "No ancient building," he writes, "should fall into hands which have not the tenderest regard even for what is ugly, as ugliness is classed at the moment when it is dealt with; and above all, it should not fall into hands of builders, no matter by what architect directed, who have no experience other than that of modern methods of building." In other words, there is no absolute standard of beauty. What was once esteemed is now despised and may be again deemed delightful. It is almost exactly what Mr. Balfour said in his Romanes lecture at Oxford; but Mr.

Caröe got in some time before him with the not very recondite observation. The moral of this changing view of æsthetic values must be very gratifying to the Society for the Preservation of Ancient Buildings, for it amounts to this—that you should destroy nothing that is old, no matter how ugly you may think it, since your judgment may be prejudiced by the convention of the moment!—a very comfortable doctrine for the old-work enthusiast; for it reduces the wicked "destroyer" to absolute helplessness. It renders the whole problem absurdly simple; and yet it is a greater mystery than that which made the ugly duckling a potential swan. The change in the duckling was observable and explicable; the difference between our own vision and that of our forefathers is inscrutable. Mr. Caröe's proposition, however, is strictly true, providing it is not pushed to extremes. There can be no doubt that much beautiful work has been destroyed, not out of wantonness, but from ignorance of the waywardness or mutability of taste, and recognition of the fact should render us more cautious in dealing with "excrescences" and the like. At the same time, it cannot be denied that veneration for what is merely old can be easily overdone, and is often carried to absurd extremes, the very "vesture of decay" being regarded with fatuous ecstasy. It is between these extremes that sublimated common sense gets in its worthy work, with hearty abuse from both sides as its reward. That is about all the light that we have been able to derive from a rather futile discussion of a subject in which general agreement is utterly hopeless, since the factors in the problem are elusive and indefinable.

An Abortive Competition.

The Derby Education Committee seems not to have taken sufficiently to heart the wisdom of the Socratic question beginning, "Thou that teachest another—." The terms of its advertisement inviting designs for a new school did not secure the approval of the R.I.B.A., nor of the local society of architects. A resolution on the subject was consequently rescinded by the committee, who, however, declined to accede to the request that an assessor should be appointed. The committee thought that such an appointment "would have precluded them from having the deciding voice in the selection of plans." Consequently, they seem to have abandoned the competition, as they have empowered a sub-committee to appoint an architect to prepare the designs. We can only cherish the hope, while we cannot entirely banish a suspicion to the contrary, that this decision was not dictated by pique, as though the thought were: "If we cannot do it our way, we will not do it your way, but will choose an independent method." It is to be supposed that even Education Committees are not completely immune from such little ebullitions of temper; which fact, we trust, is always duly taken into account when such bodies are approached officially with respect to their adventures in building. The Committee's objection to appoint an assessor is perhaps understandable on somewhat similar grounds. An education committee may be easily imagined to possess rather more than the normal allowance of intellectual independence, and may perhaps be excused a slight excess of authoritative assumption. In such a case, it is quite possible to condone such failings, because they may be charitably supposed to "lean to virtue's side." True, there is that disturbing thought, "Thou that teachest another, teachest thou not thyself?" The Committee might, perhaps, have been a little more amenable to professional advice. But a strong committee does not easily brook dictation, and that is a feature of the competition system which is not always sufficiently taken into account. We do not see, however, that the Committee's objection was insuperable. Granted that if a competent assessor is appointed, it is wise to accept his decision; yet authorities have been known to act as moderators on the verdict. Probably in doing so they take a certain amount of legal risk; for if they override the assessor they can no longer shelter themselves behind him; yet if we read this case aright, this particular committee was prepared to incur the equally imminent liability attendant on dispensing with an assessor, which, in the present state of the law, is surely an unwise course to pursue. We are, of course, sorry that the architects did not, in the instance under notice, succeed in carrying their point. At the same time, we cannot help thinking that some *via media* more gratifying to the profession than that chosen by the Committee might have been possible if the etiquette of competitions had been a little less rigid. We cannot overlook the fact that an education committee, inviting designs for a school, may be reasonably credited with more than ordinary knowledge of its own requirements, and might therefore be expected to demand a voice in the decision. We are not aware that this opportunity was requested or denied. Again, it sometimes happens that, in arranging a competition for a hospital or an infirmary, a medical expert is conjoined with an architect in the assessorship. A similar course might be possible—but we are afraid that it would not be welcome to the architect—in the case of a school, the joint assessor in that case being an educationist. We are suggesting this merely as a *modus vivendi*, and by no means advocating it; because we seem to remember that there have been cases in which such an arrangement has worked very badly. In itself the case is of no great importance; but, as we have shown, it raises an interesting point with regard to the conduct of competitions. The whole system seems to be ripe for reconsideration by the R.I.B.A. As matters at present stand, it is a prolific cause of annoyance to clients as well as to architects; and in this instance both seem to have been hit.

Mansion House Apprenticeship Conference.

The Mansion House Conference on the apprenticeship problem, held last week, was in many respects disappointing, and builders have not much to hope from it. There was an enormous amount of talk, but no resolution was taken, and the speakers left the question pretty much where they found it. Mr. Cyril Cobb, vice-chairman of the Education Committee of the London County Council, who opened the discussion, suggested that one of the first essential movements towards reform was the raising of the school age. Another was "compulsory time off"—which means, we presume, that employers are to afford their apprentices opportunities of attending technical schools. Sir Thomas Wrightson was more definite and practical than any of the numerous other speakers, as he described a system which has been successfully adopted in a large engineering establishment in the North. In the works with which he was connected, they had placed as teacher over the boys the junior foreman in each department, the idea being that the junior foreman being the man who superintended the work of the boys during the day, would, through the knowledge he had of the character and capacity of each boy, be the best man to teach them in the evening the theory of the various operations of the day. It is to be hoped that the working day is short, otherwise the boys, being sick of the practice, might not be very keen to study the theory. Sir Thomas, however, was able to assure his hearers that under this system his firm was turning out some most promising young workmen. The system, however admirable in its results, does not strike us as being capable of general application; for instance, it could hardly be adopted in the building trade; which brings us to the observation that at this meeting the largest of the great industries seems to have been unrepresented—why, we cannot conceive. A comparatively small section of the working community—the printers—were very ably represented by Mr. Walter Hazell; but if any representative of the kingdom's largest synthetic industry voiced its views, his utterances were not chronicled in any report of the meeting that we have seen. Mr. Hazell went straight to the heart of the matter. He observed that business hours are now too long to admit of youths successfully following a system of technical education carried on after business hours. What was wanted was a system of day training schools. He seems not to have mentioned at this meeting a fact of which he is very well aware—that printers have long allowed what Mr. Cobb had called "time off" to apprentices, in order that they might attend afternoon classes at the St. Bride Foundation Institute, London, E.C., the Borough Polytechnic, and elsewhere. Nor did he mention the almost equally interesting fact that it is still the general custom among printers to bind boys for the perhaps excessive term of "seven long years," as the apprentice sings in "Sally in our Alley." Those builders who are interested in the question of apprenticeship, and in the education of the apprentice might obtain much useful information on the subject from the St Bride Institute, and much valuable advice from Mr. Walter Hazell himself, who has long been an active worker in the cause of technical education. Seeing that he was invited to the meeting, and that he spoke so much to the purpose, it cannot be said with justice that the conference was altogether barren and sterile, or that the wrong people were invited. But we must confess our disappointment at its lame and impotent conclusion. We take some comfort in the thought, however, that a Mansion House meeting is usually more fruitful in suggestion and in influence than in actual accomplishment; and it may have justified itself by the widespread attention to the subject that has been attracted by the reports of its proceedings. Perhaps, in the circumstances, a purely academic discussion was all that was possible, or even desirable. The matter is assuming too much importance, and is of too large a complexity, to be settled out of hand at a meeting representing (however inadequately) so many and such varied interests. The ground of our disappointment is that it has done so little to establish useful general principles.

BUILDERS' BENEVOLENT INSTITUTION DINNER.

The sixty-second annual dinner of the Builders' Benevolent Institution was held in the Whitehall Rooms, Hotel Metropole, London on Thursday, the 2nd inst. Mr. Howell J. Williams, J.P., L.C.C., President B.B.I., occupied the chair, and among the guests were noticed Sir R. Melvill Beachcroft (chairman L.C.C.), E. Smith, J.P., G. A. Hardy, M.P., T. Davies, M.P., W. Higgs (P.P.B.B.I.), E. B. Ellis, F.R.I.B.A., W. Lawe, jun., J. W. Lorden (P.P.B.B.I.), G. Crickmay, F.R.I.B.A), B. I. Greenwood (P.P.B.B.I.), J. H.Colls (treas. and P.P.B.B.I.), J. S. Gibson, F.R.I.B.A., J. Carmichael, J.P. (P.P.B.B.I.), J. Randall (P.P.B.B.I.), F. G. Rice (president L.M.B.A.), G. Bird Godson, W. Collins, J. F. Parker, J. W. Chessum (P.P.B.B.I.), H. A. Bartlett, G. M. Nicholson, F.S.I., J. Sabey, H.T.A. Chidgey, and T. Costigan (secretary B.B.I.). The toasts, "His Majesty the King," "Her Majesty Queen Alexandra, Their Royal Highnesses the Prince and Princess of Wales, and the other members of the Royal Family," having been proposed by the President, and loyally honoured by the company,

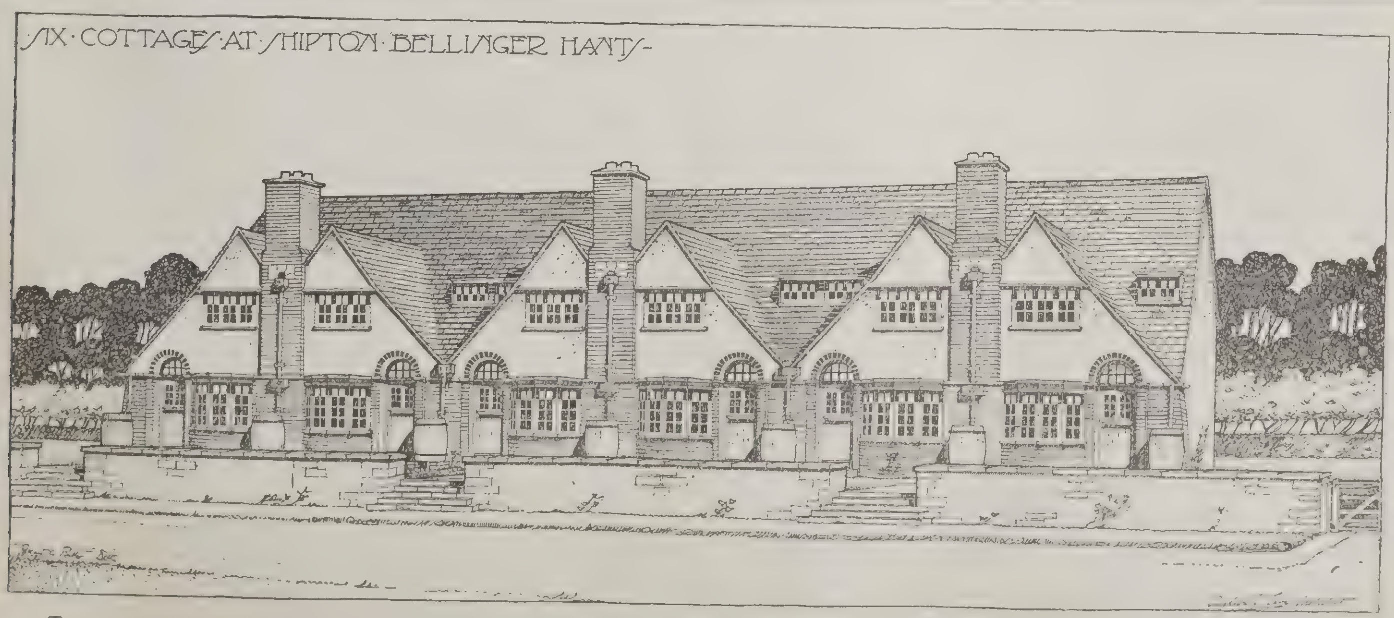
Mr. J. Howell Williams, in proposing the toast, "The Builders' Benevolent Institution," observed that it was a particular pleasure to get out of the party arena and to meet men for a benevolent purpose. He felt with some remorse that he ought to have occupied his present position some years ago, but public life had compelled him to shirk the duty. Realising that this was the sixty-second annual dinner, and seeing the magnificent giants who had gone before, he could not but be conscious of his inadequate occupancy of the office. It was a nasty thing to beg, but that was his mission. One of his municipal duties was to visit the L.C.C. schools; and he always impressed upon the children the motto, "I come to school for a purpose." His object in mentioning this was to emphasize the fact that he was there for a purpose—the augmentation of the funds of the society. He would not breathe the cause, but there was a most serious depression in the building trade. The immediate effect of this was that the number of pensioners had increased, and the funds naturally had decreased; so much so that they had had to draw on the reserve, and, therefore, it was his duty to make an extra appeal. He was reminded at this juncture of the story about the mistress who, hearing a mysterious noise in the locality of the kitchen, went downstairs to investigate. Everything was in order and the servant knew nothing of the disturbance. Hearing a suspicious sound in the cupboard, the mistress opened the door and discovered a full-blown soldier. "Oh," said the maid, "I know nothing about it. It must have been left there by the last servant." It was the same with himself. He applied the moral of the tale to his own case, and refused to accept responsibility for what had been left behind by the last president. In spite of the great trade depression, some of them had earned increment—he would not say "unearned." Times had certainly changed, and the change had brought the quantity surveyor. If they could only get quantity surveyors of the right sort, they were not so likely to be ruined. He pleaded for a generous answer to his appeal. Who knew but what times of adversity would overtake even the best endowed? He asked them to do their very best, and coupled with the toast the name of J. Howard Colls.

Mr. J. Howard Colls, rising to respond to the toast, observed that they owed a special debt of gratitude to Mr. Howell Williams for presiding on that occasion, and entering upon so thankless a task. While both masters and men were suffering from the same cause, it was essential to their existence that they should help each other. They all knew that the number of men in their own trade suffering from lack of employment amounted to something between 30 and 40 per cent. Small wonder that the Institution solicited the earnest support of those who were able to give it. The president had, with a modesty that did not always distinguish his countrymen, entirely obliterated his own name from the toast list. There was no toast, "The President." Nevertheless, he would ask them to drink his very good health.

Mr. Howell Williams, responding to the toast, said he would express himself in the old Welsh saying, "Thank you for thanks." Turning to the question of modern innovations, Mr. Williams referred to the progress of "steel construction" and "reinforced concrete; and he spoke also of the exorbitant requirements of Councils and clients generally. For instance, he proceeded, they would read that a new hall was to be built (several voices, simultaneously: "Where"?). All the old material was to be incorporated in the new building, and the old hall was not to be disturbed until the new one was erected. This was an example, somewhat exaggerated perhaps, of the sort of thing the builder had to contend with.

Mr. J. Carmichael, J.P., in proposing the toast, "The Architects and Surveyors," observed that he had reached the stage when he might honestly claim to be acquitted of the excitement of after-dinner speaking. That duty should devolve upon young men, and not upon one who was sunning himself in the afternoon of his commercial career. Never before, he believed, in the history of building, had the art reached so high a level of accuracy and efficiency; and, in that state, it was never more difficult in the execution than it was to-day. It was said that quantity surveyors made mistakes. They never did—or if they did, they never owned to them. The work in all its branches was subjected to very rapid movement; and the average architect in London had to be a veritable walking encyclopædia. Sketch plans were usually required within a week—the completed plans within a month. The quantities were then taken very rapidly off, and the builder was given three days to price them. The result was naturally something not worth having. He was reminded of a story he heard recently at a political meeting. An Irishman succeeded in selling a horse to a customer, who, from the very eulogistic account that was given of it, became somewhat suspicious, and said to the Irishman, "Now, Pat, what's really the matter with the horse?" "Well," said the Irishman, "two things. First, if you turn him into a field you'll have great difficulty in catching him. Second, when you've caught him he's not the least bit of good." Continuing, Mr. Carmichael said the language was not his but the Irishman's. It was just the same with buildings. When you got them they were not a bit of good.

Mr. G. Crickmay, F.R.I.B.A., who rose to respond for the architects, observed that architects as a body greatly sympathised with the builders. Their interests, although not identical, had much in common. When architecture was bad, building was necessarily bad also. The Benevolent Institution was one specially worthy of support in every possible way. It was always a pleasure for him to meet builders, for whom he felt great admiration and respect. He was gratified to hear recently from a gentleman who travelled extensively round the country, that nothing was so pleasing and delightful as the English gentleman's house. In this respect, at least, the English architect excelled his foreign brethren. During the last ten years he had been struck by the great improvements that had been effected in London. As people became more and more interested in good architecture and good building, so the demand for improvement was stimulated. The trend of public taste was to be observed in town planning, and the garden cities, which had the effect of making people think.



These cottages, of which the plan is shown on the next page, have brick walls for the lower part, with roughcast above, and stone-tiled roofs

AYLWIN O. CAVE, ARCHITECT.

Mr. G. M. Nicholson responded to the toast for the surveyors, and referred to Mr. Carmichael's statement that surveyors were inaccurate. He would remind them that there were also mistakes that builders made, and would not acknowledge. Surveyors were certainly in a most difficult position. Mr. Howell Williams had said that they wanted the right sort of surveyor. The "right sort" depended largely upon the point of view. Perhaps the description would suit the surveyor who, when some slight alteration was required to be made, would declare that the whole cost of the room would thereby be increased 25 per cent. Mr. Nicholson then proceeded humorously to enumerate several of the builders' vulnerable points and their minor delinquencies. The boom at the end of the last century, he continued, had the inevitable reaction, and the many building firms that had sprung into existence had since had cause to regret it. Within the last seven years they had two big wars which had resulted naturally in raising the price of money. Concluding, he thought that building land should be placed upon the same basis as agricultural land.

Mr. Greenwood, who, in the absence of Mr. H. H. Bartlett, proposed the toast, "The Houses of Parliament," said he sincerely trusted that the toast would never require alteration. One of the houses, he would not say which, as politics were strictly barred, might with much accuracy, be likened to Mr. Carmichael's horse. Each could interpret his words in his own way, and then no one would be disappointed. He thought that this toast was one which should never be omitted from the list.

Mr. G. A. Hardy, M.P., responded to the toast, and observed that the English Parliament was the envy and admiration of the world. It was remarkable for its wonderful purity, and he was assured that the charge of "jobbery" could never be brought against it.

Mr. F. G. Rice (president L.M.B.A.) rose to propose the toast, "Municipal Authorities," and said he regretted that politics entered too much into municipal life. Being themselves a benevolent body, he must try to say something in their favour. He shared with the average man the idea that Councils existed for the purpose of taxing him and his unfortunate fellow-men alone. He knew very little about municipal life, although he himself had at one time been a candidate for municipal honours, but had been defeated. He had, however, lived long enough to receive the congratulations of his friends. It was only 150 years ago that the ancient guilds, whose powers had devolved upon the corporations, could prevent at their own discretion people carrying on a trade without their consent. All this was happily at an end. He hardly knew which was the more difficult—to make tradition or to sustain tradition. Sir Melvill Beachcroft had done both with commendable ability. He wished that Sir Melvill would render even more successful his term of office by scrapping all the little building Acts and making one big comprehensive Act.

Sir Melvill Beachcroft (chairman L.C.C.) responded to the toast, and observed that he was sure they would not desire him to reply for each individual municipal authority, of which there were 103. He confessed that he had heard a great deal to surprise him. The L.C.C., even in these hard times, were expending huge sums upon new buildings, etc. The schools involved annually about half-a-million of money, and asylums accounted for a like sum. Nearly three-quarters of a million of money was being expended upon street improvements, in spite of the heavy slump. Unquestionably the trouble began in 1897, when such unusual activity took place in the building trade. They had never got over the reaction. He had taken note of several tit-bits, which he hoped to utilise during the few remaining months of his chairmanship at Spring Gardens. That humble and unfortunate body of men, lawyers, of which he was a member, themselves had two benevolent institutions for aiding those who fell out of the running.

At this juncture it was announced that the appeal for contributions in aid of the Institution had resulted in a total sum of £860 14s. 6d. Mr. Stephen Collins, M.P., then proposed the toast, "The Vice-Presidents, Committee and Stewards," which was received with much heartiness.

Mr. John T. Bolding replied in a few brief and appropriate remarks, and the company dispersed. During the intervals between some of the speeches, an excellent musical programme was given by Mr. Herbert Schartau, assisted by Miss Edith Serpell, Miss Carrie Herwin, Mr. Henry Turnpenny, and Mr. Harold Montague, the rendering of the unaccompanied quartettes being particularly fine.

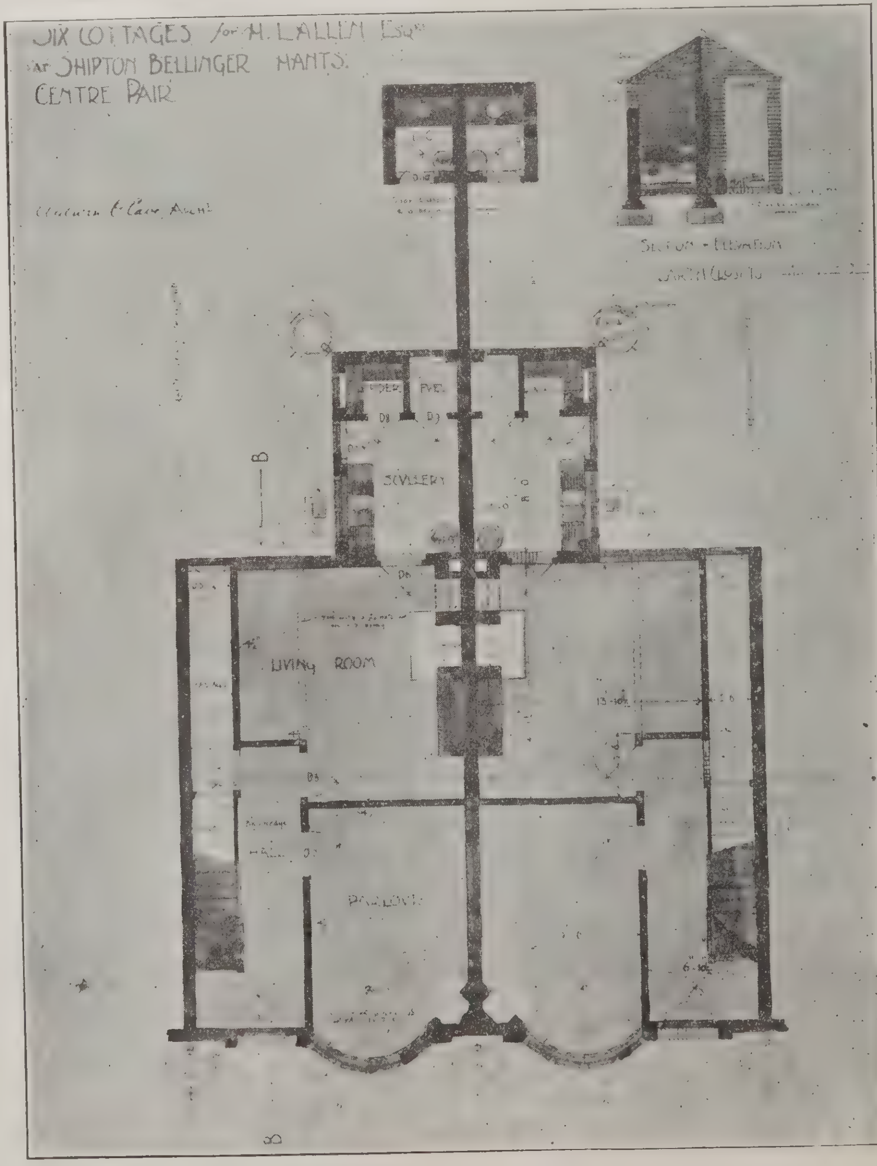
Societies' Reports.

Architectural Association Debating Society

The fifth meeting of the session was held on Friday, November 26th, when a debate took place upon "Competitions Open v. Limited." Mr. K. Gammell spoke in favour of open competitions, where it was a question of public buildings to be erected with public money. In such cases he contended it was morally wrong for a public body to select a limited number of architects to compete, and it was only fair to the young and unknown architects to have an opportunity of submitting a design. An open competition was the only way of obtaining the best design. Mr. W. G. Wilson, in opposing Mr. Gammell, and speaking in favour of "limited" competitions, said that public bodies had not only to see that they obtained the best design, but that the architect was capable of carrying it out, and in this respect a competition was useless. Further, that in the case of an open competition, where there were such large numbers of designs submitted, it was, humanly speaking, impossible to say which was really the best; the competition then becomes a gamble. He also said that to contend in open competitions was not the best way for a young architect to build up a practice. Messrs. Hamp, R. Smith, Forster, Jacob, Ross and Bullock took part in the debate. Mr. A. H. Belcher was in the chair, and on a show of hands, he declared the voting to be in favour of "Open" competitions by a majority of one. The next meeting will be a joint meeting with the junior members of the Surveyors' Institution, and will be held at 18, Tufton Street, on Friday, December 17th, when Mr. Raymond Unwin will move, "That the planning of towns and estates should be designed by an architect assisted by a surveyor."

Edinburgh Association of Science and Arts.

Mr. F. A. Macdonald, C.E., Glasgow, read a paper to the members of the Edinburgh Association of Science and Arts in the National Portrait Gallery on "Reinforced Concrete Construction." Among the advantages of reinforced concrete construction were rigidity and absence of vibration, durability, no subsequent outlay for maintenance, and resistance to fire. A general definition of what was meant by reinforced concrete construction might be stated as a combination of concrete



AYLWIN O. CAVE, ARCHITECT

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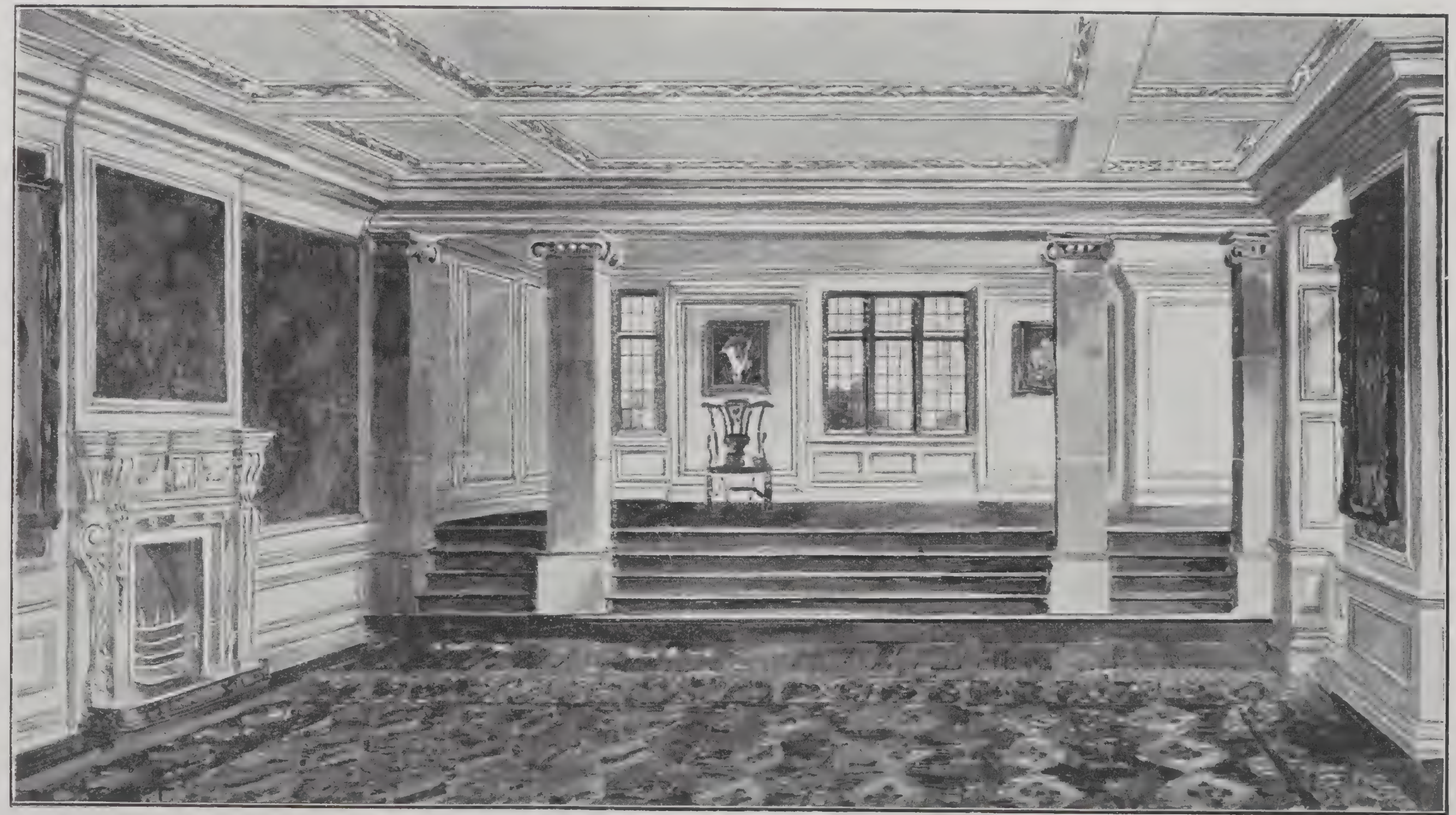
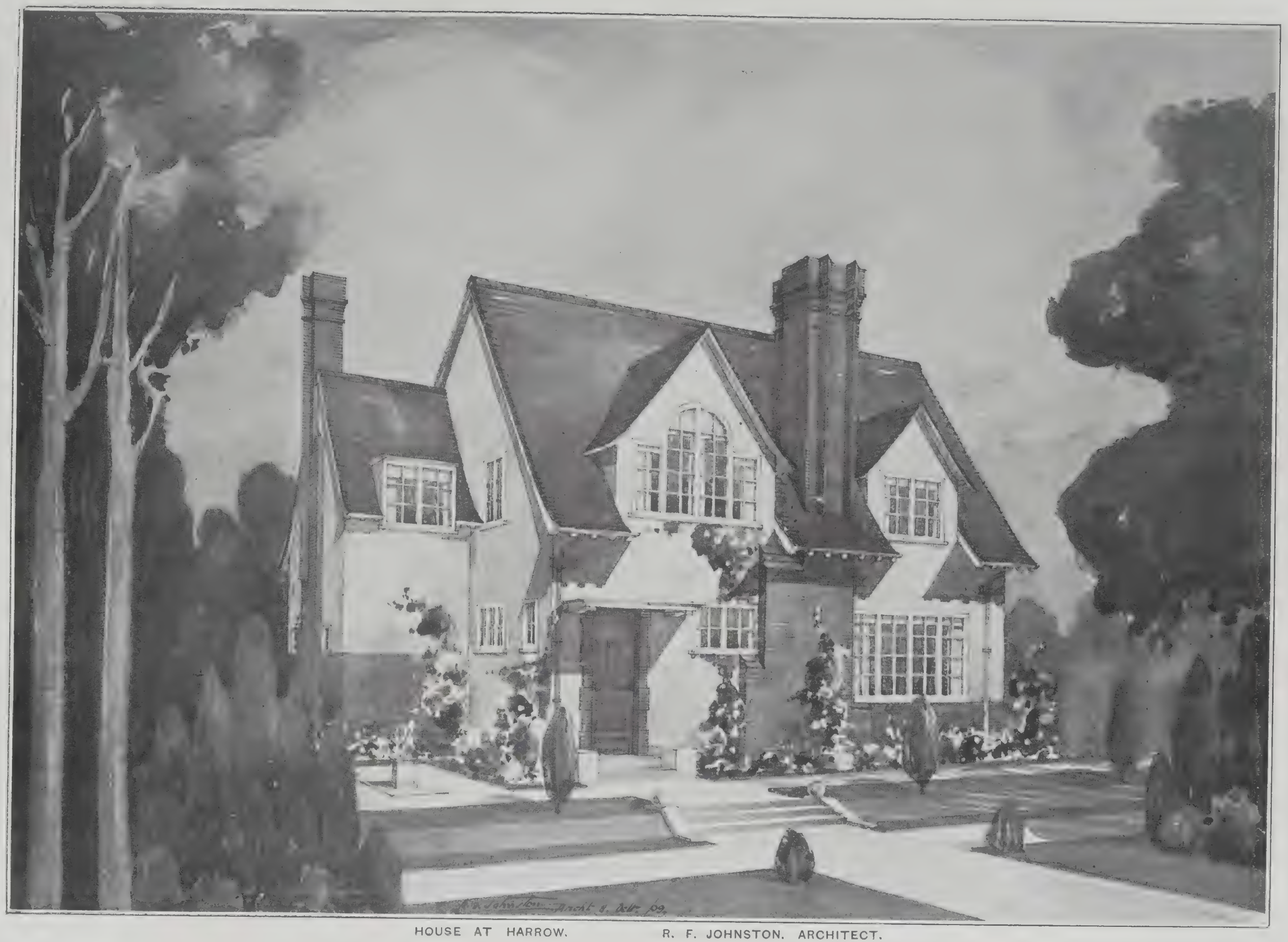


DINING ROOM, CASTLE ASHBY (AS ALTERED) FOR THE MARQUESS OF NORTHAMPTON. C. HARRISON TOWNSEND, F.R.I.B.A., ARCHITECT.


R. F. Johnston Archt 8 Octr 09

HOUSE AT HARROW. R. F. JOHNSTON. ARCHITECT.

and steel in a monolithic type of design, forming a homogeneous whole, in which the maximum of the inherent qualities of each of the two component materials was combined and fully developed. From the economic standpoint the saving of cost was not inconsiderable, and there was also a saving in deadweight, and consequent economy as regards pillars and foundations. The advantages of reinforced concrete construction had been recognised by the Government's great spending departments, and the lecturer stated that important works were shortly to be commenced in Scotland, where reinforced concrete would be largely used. Recognising the importance of some standardisation of formulæ both as a safeguard and as a guide, the Royal Institute of British Architects had issued a set of regulations, which were very valuable, and gave data which could be intelligently worked on. Mr. Macdonald hoped that still further standardisation both of formulæ and notation for the calculation of reinforced concrete structures would be eventually drawn up and their observance recognised by all designers. The lecturer also gave a full description of a special type of reinforced concrete beam as invented by himself in conjunction with Mr. Charles Baudart.

Gloucestershire Architectural Association.

An interesting lecture under the auspices of the Gloucestershire Architectural Association, was given at Northgate Mansions on Thursday evening by Mr. W. L. Bernard, F.R.I.B.A., of Bristol, upon "The Temples of Baalbec." Since visiting the ruins of Baalbec five years ago, Mr. Bernard delivered a paper before the Bristol Society of Architects, and his fascinating and instructive account of the former grandeur and present condition of these ancient temples—among the most ancient in the world—illustrated as it was by a very fine series of photographs and drawings in the form of lantern slides, was followed with close attention and keen appreciation by a good audience, which comprised members and friends of the Association. As Mr. Bernard pointed out, the history of Baalbec, which is situated in Syria, east of the Anti-Lebanons, is enshrouded in legendary tradition, but the wonders of the ruins speak for themselves, and have peculiar charm for the archæologist. Mr. H. W. Chatters, F.R.I.B.A., of Cheltenham, the president of the Association, heartily welcomed the lecturer, and at the close a vote of thanks was unanimously accorded, on the proposition of Mr. T. S. Ellis, seconded by Mr. W. B. Wood.

Leicestershire Architectural and Archæological Society.

At the bi-monthly meeting of the Leicestershire Architectural and Archæological Society, Major Freer reported that the subcommittee appointed at the last meeting to consider the question of holding a conversazione in January next had met, and, after fully discussing the question, had come to the conclusion that it would be better to postpone the same for the present.—It was resolved, however, on the proposition of Mr. Thos. Bailey, seconded by Major Freer, to refer the question to the hon. secretaries whether it would not be possible to hold the society's annual meeting on the 31st of January at the Grand Hotel, preceded by a lunch or tea, and Mr. S. Perkins Pick, F.R.I.B.A., was invited to give a lecture on "Roman Leicester" on that date, which he kindly consented to do if the arrangements were carried out.—On the proposition of Major Freer, seconded by Mr. S. P. Pick, the Rev. S. T. Winckley, M.A., was elected as excursion hon. secretary.

Leeds School of Art.

Mr. Butler Wilson delivered the second of a series of lectures on "The Arts in England at the Close of the Seventeenth Century," his subject being "Sculpture and Decorative Painting." Mr. Wilson pointed out the great dearth of sculpture pure and simple as compared with carving, which was prolific at this period. He called attention to the lead statue of James II., by Grinling Gibbons, which originally stood behind the Banqueting-house in Whitehall, but was now in front of the new Admiralty buildings in St. James's Park, and also mentioned the equestrian statue of Charles I. by G. Le Sueur, which stands on the south side of Trafalgar Square, between the Strand and Whitehall. The carving of the school of Gibbons was dealt with in great detail by the lecturer, who showed, by means of lantern slides, examples of the work from St. Paul's Cathedral, Hampton Court Palace, and St. James's, Piccadilly. The second part of the lecture was devoted to a consideration of the decorative paintings of the period. The influence of P. P. Rubens on the British school of decorative painting was more particularly illustrated by the ceiling of the Banqueting-house in Whitehall, and of this views were shown for the first time, by permission of His Majesty's Commissioner of Works (Sir Schomberg MacDonnell). Mr. Wilson also gave a number of details of the recent restoration of the ceiling, and added that the nine pictures and frames from the ceiling weighed altogether nine tons. The ceilings in the buildings designed by Inigo Jones were, it was presumed, intended to be completed by the insertion of paintings. With the restoration of the Monarchy this form of art again flourished, and none of the numerous great mansions were considered complete until they were so decorated. Unfortunately, no kind of painting in England had suffered so much from time, neglect, and demolition as had ceiling and wall paintings. The decoration of ceilings by paintings was more universal in Holland during the seventeenth century than in England, and consequently, with the accession of William III. the fashion still further increased in this country. A number of slides were shown depicting the portraits of the beauties of the Court of Charles II. now hanging in the bedroom of William III. in Hampton Court Palace, and Mr. Wilson added that by viewing these portraits one could imagine oneself transported into that mixed society of frail, beautiful, and interesting women, the professional beauties of the time.

Bradford Arts Club.

Mr. R. G. Kirby, the city architect of Bradford, delivered a lecture on November 30 to the Bradford Arts Club, on Garden Cities and Town Planning. He referred to the manner in which towns had been allowed to develop haphazard, traced the garden city movement, and gave an account of what had been done in England and on the Continent. He said that in most English towns opportunities seldom occurred for the creation of large civic centres; but in Bradford there was likely to be such an opportunity in the near future when the much-discussed and long-anticipated improved railway facilities were provided. It was to be hoped that such an opportunity would not to be allowed to pass without some open place being planned on broad lines, effectively to receive and distribute the ever-growing streams of traffic, to provide for parades, and also to show to the best advantage such public buildings as might already abut upon or be erected around it. Such a place should be monumental in character, turfed and planted with trees, in addition to providing suitable roads and ways for vehicles and pedestrians.

In connection with such a scheme it might be found possible to provide facilities for the linking up of the various tramway routes in some central exchange, so as to avoid the great inconvenience now experienced, particularly on wet or stormy nights, in passengers having to change from one car to another in crossing the city. Every citizen of Bradford should hope for a greater commercial expansion, and should have faith in a "Greater Bradford" yet to be; but unless facilities were provided for such an expansion it would be futile to expect such hopes to be realised. If a suitable area of land were acquired on the outskirts of the city—and this, he thought, would be quite feasible—it would be possible to provide sites for new factories, with adequate railway facilities. New industries might be induced to come to the city, and thus to contribute to that expansion and enhanced prosperity which was so earnestly desired by all.

The Institution of Municipal Engineers.

At the meeting of the Council of the Institution, held at 39, Victoria Street, London, S.W., on Saturday, November 27th, 16 applications for admission to membership and 3 for admission to studentship were considered. Eleven applicants were elected to membership and 3 to studentship. The roll of the Institution now stands at 641 members and 92 students, making a total of 733. The President and the two Vice-presidents of the Institution were elected as delegates of the Council of the National Association of Local Government Officers. The letter from the honorary secretary of the Municipal Engineers Imperial Defence Committee was considered, and it was decided to refer the whole matter back for further consideration. A number of letters, expressing approval of the proposed formation of an associate member class, were presented by the secretary, and further consideration of the matter was deferred. It was decided also to defer consideration of the secretary's report. Messrs. C. Owen Baines (S.W. district), T. Francis Hewitt (N.E. district), Bernard Partridge (S.E. district), and Ernest W. Veale (S. district) attended the joint meeting of Council and Honorary Secretaries of the District Committees, and, after considerable discussion, it was resolved that the secretary send to the respective hon. secretaries copy of the notes taken at the meeting, and report further at the next meeting of the Council.

Law Case.

London District Surveyor's Fees.

At Lambeth Police Court on November 30, Mr. Hopkins gave judgment in the test case of Dicksee versus Galbraith Bros., which was reported in our issue for November 24th. The point raised was whether builders erecting schools for the London County Council were liable for the district surveyor's fees. Mr. Hopkins, after reviewing the case, held that they were, and made an order for the payment of the amount claimed, £16 7s. 6d., allowing complainant 20 guineas costs.

Our Plate.

House at Harrow for John Harvey, Esq.

This house is to be treated externally in white rough-cast and red brick, with red sand-faced tiles on roof. The external woodwork is painted white. In plan, the house is simple. It has a square hall with a fireplace. The dining-room is treated with oak beams in the ceiling. There is convenient access from the dining-room to the kitchen. The drawing-room, with French window leading to the garden, has a modelled plaster ceiling. On the first floor there are three bedrooms, servant's bedroom, box-room, linen cupboard, and bathroom, lavatory, etc. The architect is Mr. R. F. Johnston, of Chiswick.

With reference to the construction of the proposed new road to Dartford, the clerk to the Erith Urban Council reported to that body at a recent meeting that the Local Government Board had declined to sanction the proposal of the Dartford Board of Guardians, that the work be carried out by the unemployed of the district. Mr. A. Button thought that the Council should protest against the action of the Local Government Board. Mr. Kibblewhite (vice-chairman) expressed himself in agreement with Mr. Button. A resolution was passed that the Council receive with regret the intimation that the Local Government Board had not seen its way to grant the request of the Dartford Board of Guardians.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Dec. 11.	MINEHEAD. SHELTER, with cloakroom and lavatories, on the Beach, the whole expense of which is not to exceed £3,000. Premium of £20. Plan of site and conditions from L. C. Webber-Incledon, Clerk to U.D. Council, 16, Park Street, Minehead, Somerset.
Dec. 18.	TRAINING COLLEGE FOR TEACHERS, Kirkstall Grange, Far Headingly, Leeds. Architects practising in Leeds are invited to submit competitive designs for the above College. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed Assessor. Copies of the conditions of competition and instructions, a plan of each floor of the educational blocks and of the hostel blocks, also an estate plan, showing a suggestion for grouping the various buildings, may be obtained from James Graham, Secretary for Education, Education Department, Leeds. Designs to be delivered not later than 12 o'clock noon. Deposit: £2 2s.
Dec. 31.	SOUTHEND-ON-SEA. NEW COUNCIL SCHOOL. Limited to Architects practising in the Borough. Conditions of competition and plan of site on application to J. W. Barrow, Clerk to the Education Committee, Education Offices, Municipal Buildings, Southend-on-Sea.
1910. Jan. 1.	LARNE. TECHNICAL SCHOOL IN VICTORIA STREET. For the Larne Technical Instruction Committee. Total cost, including fixtures and enclosing of ground, not to exceed £3,600, Premium, £21, merged. Successful competitor will receive commission of 5 per cent. for supervision, including plans, specifications, estimates, and *Bills of Quantities*. Particulars of Thomas Clearkkin, Secretary, Technical In-Instruction Committee, Larne.
1910. Jan. 31.	NATIONAL MUSEUM OF WALES. The Council desires to receive competitive designs for the erection of a new National Museum at Cardiff, Three premiums are offered of £200, £150, and £100, for second, third, and fourth. The Council have appointed Sir Aston Webb, R.A., Mr. John J. Burnet A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A., as Assessors. Particulars and plans of the site will be supplied to competitors on payment of a fee of £2 2s., returnable if all papers are returned within 14 days. Inquiries to be addressed to Dr. Wm. Evans, Hoyle, Director of the Museums, City Hall, Cardiff.
Feb. 1.	OLDHAM, EXTENSION OF THE TOWN HALL. Restricted to Architects practising or residing in the Borough. Premiums of £50, £30 and £20, for the three designs placed 1st, 2nd and 3rd, and a sum of £5 will be paid to all unsuccessful competitors who send in a complete set of plans in accordance with the instructions. Plan of site, with instructions and suggestions for architects obtainable from E. C. Foote, Borough Surveyor, Town Hall, Oldham. Deposit: 21s.
Mar. 1.	GLAZED BRICKWORK DESIGNS AND ESSAYS. A committee of glazed brick manufacturers invite designs for works to be executed in glazed brickwork, also essays as to the advantages to be derived from the use of this material in accordance with conditions to be obtained from J. Johnston Green, 142, Liverpool Road South, Southport. Premiums of 100 guineas, 50 guineas and 25 guineas awarded to designs and essays jointly. Assessor Mr. Max Clarke, F.R.I.B.A., appointed by the President, R.I.B.A.
No Date.	CRADLEY HEATH. The trustees of the United Methodist Church invite Architects to submit designs on approval for Sunday School with seating accommodation for about 1,000. For particulars, Mr. C. Clee, Cradley Heath, Staffs.

Barnsley secondary school, which has just been opened, and is believed to have cost, in all, £25,200, accommodates about 400 girls, and about 60 younger children in the kindergarten department. Messrs. Buckland and Farmer, of Birmingham, are the architects.

Coming Events.

Wednesday, December 8.

INSTITUTION OF CIVIL ENGINEERS.—Visit of Students to Messrs. Barclay, Perkins and Co.'s Brewery, Park Street, Southwark.

Thursday, December 9.

THE SOCIETY OF ARCHITECTS.—Mr. Raymond Unwin on "Town Planning," at 8 p.m.

Friday, December 10.

ARCHITECTURAL ASSOCIATION.—Mr. F. C. Eden, on "Varallo, Orta, and Varese," 7.30 p.m.

Saturday, December 11.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—General meeting in the Wood Memorial Hall, Newcastle, 2 p.m.

INSTITUTION OF MUNICIPAL ENGINEERS.—General meeting at Caxton Hall, Westminster, 11 a.m. Dinner, Gaiety Restaurant, Strand 7 p.m.

Monday, December 13.

R.I.B.A.—Professor A. D. F. Hamlin, on "Architectural Education in America," 8 p.m.

Tuesday, December 14.

NATIONAL FEDERATION OF BUILDING TRADE EMPLOYERS.—Meeting of Administrative and Journal Committees.

ANCIENT ARCHITECTURE LECTURES AT THE BRITISH MUSEUM.—Mr. Banister Fletcher's 11th paper, "Origin and Evolution of the Corinthian Order," 4.30 p.m.

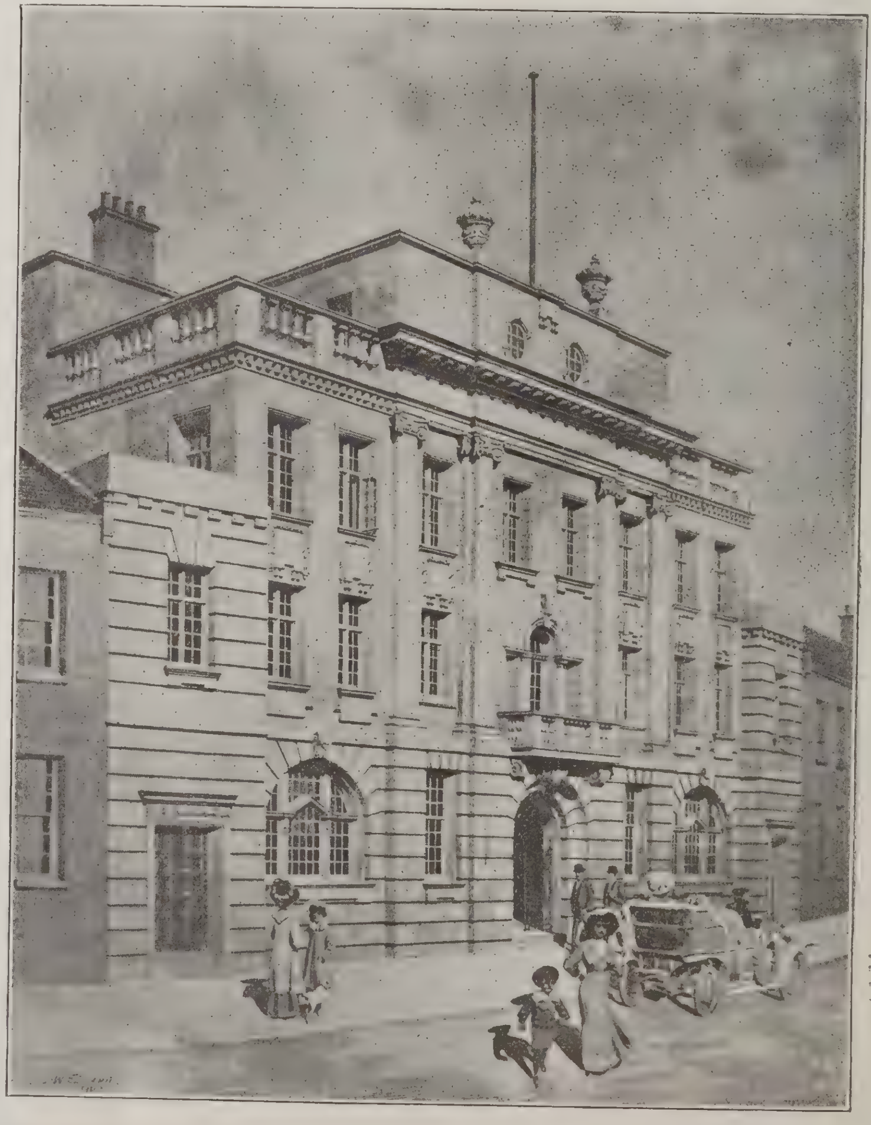
INSTITUTE OF SANITARY ENGINEERS.—Students' Meeting. Mr. Geo. W. Chilvers, M.R.San.I., on "Practical Heating and Hot Water Supply to Buildings," 7 p.m.

Tuesday, December 14.

THE TRADES TRAINING SCHOOL, of 153, Great Titchfield Street, W. Presentation of prizes at the Carpenters' Hall, London Wall, by the Duke of Argyll, K.T., etc. 8 p.m.

BUILDING ACTIVITY IN LEEDS.

Although very few people require the erection of shops or houses in Leeds at the present time, the local building trade has not come entirely to a standstill, and some notable improvements in the streets devoted to commercial, insurance, and banking concerns are in progress, while others are in contemplation. For several weeks "breakers" have been at work on the Old Cloth Hall Hotel and the adjoining aged buildings in Infirmary Street, opposite the northern side of the General Post Office. The erection of a modern building on this site will complete the transformation of the street, which began with the demolition of the big Cloth Hall and the subsequent erection of the Post Office. One or two fine blocks, a writer in the "Yorkshire Daily Observer" remarks, have been put up during the last decade, and when completed the street will be worthy of its near neighbour, Park Row. The latter thoroughfare will be much improved when the new buildings of the Union of London and Smiths Bank, Limited, are completed. These adjoin the recently finished Scottish Union buildings and the two firms very wisely agreed to adopt the same designs and material, so as to avoid the incongruity which spoils the effect of so many contiguous buildings in Leeds. In East Parade, the shops and offices which have been acquired by the Pearl Insurance Company are gradually being emptied, and the work of demolition to make



THE PRUDENTIAL BUILDINGS, ABERDEEN. PAUL WATERHOUSE, M.A., F.R.I.B.A., ARCHITEC room for the fine new offices that are projected is expected to begin shortly. The vacant site in City Square is once more to be adorned or disfigured—according to one's artistic temperament—by a hoarding, but when the proposed powers have been obtained by the Corporation to acquire the adjoining Northern Hotel, and thus double the site, it is to be hoped that the ground will be put to a worthier use. With this site containing a beautiful building, and a new Midland station in harmony, City Square would indeed be a source of justifiable pride to Leeds people.

CEMENT BRICK.

Although cement brick (or concrete brick) construction is still in its experimental stage, enough is known to demonstrate that under favourable conditions it may be a strong competitor of clay brick in both price and appearance.

The extensive use of cement brick by the Plymouth Cordage Co., Plymouth, Mass., has demonstrated several valuable facts. For the construction of their new mill having an aggregate wall length of nearly one-fifth of a mile, almost two and one-half million cement bricks were made upon the ground.

The mixture used in major part of the work was 3 parts sand to 1 part cement. A few bricks were made of 4 parts sand to 1 cement, for lightly loaded walls. The brick used on the outside of the building had a facing (⅛in. thick after compression) of 2 parts fine sand and 1 part cement, with the addition of 2 per cent. waterproofing (by weight) to the cement. Enough water was used to make a mortar of such consistency that it would hold its shape under compression, without flushing water to the surface so as to cause the mortar to stick to the plates. No definite percentage can be given as to the amount of water, as that is governed largely by temperature and atmospheric conditions, but the average amount was 8 per cent.

Care in curing the brick (that is, constant wetting), will overcome to a large degree any minor weakness which is theoretically developed by a "dry mix."

To the uninitiated, the small quantity of water used would seem likely to produce a porous brick having a strong attraction for water, with damp buildings as the result of their use. As a matter of fact, these bricks do not absorb water to any great extent. Bricks 30 days old, carefully dried and then submerged in water for 16 hours, showed the results given in Table No. 1.

Table I.—Absorption of Cement Bricks.

Brick.	Weight. Dry lbs.	oz.	Saturated lbs.	oz.	Absorption oz.
Face	5	8½	5	10	1½
Common inside	5	8	5	11	3
Facing material*......	4	9½	5	10	½
Hard burned body clay brick	4	11	5	7	12

*Brick made entirely of the material used for facing the outside brick.

Table No. II. shows the results of tests made under the direction of the Ordnance Department of the U.S. Army at the Government Arsenal in Watertown, Mass. The figures are averages unless otherwise noted.

Table II.—Tests of Cement Bricks.

Test "A." Face brick; body, 3 parts sand to 1 part cement; facing, 2 parts fine sand to 1 part cement; 2 per cent. waterproofing compound added to cement by weight. Facing ⅛in. thick after compression.

Age, days.	1st crack. lbs.	Ultimate strength. lbs.	Per sq. in. lbs.
56	87,100	87,100	2,730
120	100,900	108,650	3,400
239	128,500	132,650	4,145

Test "B." Common brick; 3 parts sand to 1 part cement.

Age, days.	1st crack, lbs.	Ultimate strength. lbs.	Per sq. in. lbs.
56	69,750	71,200	2,215
92	95,000	99,100	3,080
120	119,700	119,700	3,735
239	129,000	134,100	4,095
275	162,100	164,600	5,160

Test "C." Common brick; 4 parts sand to 1 part cement.

Age, days.	1st crack, lbs.	Ultimate strength, lbs.	Per sq. in. lbs.
56	74,150	76,500	2,390
120	89,050	91,450	2,810
239	119,500	126,400	3,905

Test "D." Common brick; 5 parts sand to 1 part cement.

Age, days.	1st crack, lbs.	Ultimate strength, lbs.	Per sq. in. lbs.
56	72,150	72,150	2,240
120	80,700	86,650	2,675
239	110,000	119,950	3,710

Test "E." Two hard-burned "body" clay bricks.

Age, days.	1st crack, lbs.	Ultimate strength, lbs.	Per sq. in. lbs.
...	101,000	150,000	4,770
...	94,000	162,000	5,470

In the tests, some peculiar phenomena were noticed. The best test on a 3 to 1 brick shows 5,400lbs. per square inch. The best on a hard burned "body" clay brick showed 5,470 lbs. per square inch. The average on the clay brick was 5,120lbs., or slightly less than that for the average cement brick at nine months.

Two bricks made at the same time, from the same stock, show varying results; for instance, two bricks (3 to 1) 275 days old; first crack at 155,200lbs. and ultimate strength 155,200lbs.; first crack at 169,000lbs. and ultimate strength 174,000lbs. Compare that with the clay bricks; first crack at 94,000lbs., and ultimate strength 162,000lbs.; first crack at 101,000lbs., and ultimate strength 150,000lbs. Average results show the first crack to be at 97.4 per cent. of the ultimate strength for 3 to 1 cement brick, 96 per cent. for 4 to 1 brick, and 94.3 per cent. for 5 to 1 cement brick; and 62.5 per cent. for clay brick. The lowest percentage shown in any cement brick was 87.5 per cent.

Six kinds of cement brick were made and used: (1) common brick, output 13,500 to 14,000 per day; (2) face brick, 9,400 to 9.800 per day; (3) 2in. radius brick for inside jambs, 8,400 to 8,800 per day; (4) outside corner brick (face and one end waterproofed), 8,000 to 8,400 per day; (5) headers, with one end faced, for arches and header courses, 9,000 to 9.400 per day; (6) white brick (faced with white cement for interior of the engine room), output the same as for the face brick.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

***The** Editor is willing to answer enquiries from readers who require information on architectural, constructional, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.*

***Enquirers** whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.*

***Answers** by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.*

***This** fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.*

***The** Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable: and it must be understood that both question and reply will, as a rule, be published in these columns*

Fixing Casement Stay.

SHREWSBURY.—"SHREWSBURY" writes: "On the weathered exterior of a stone sill, the casement stay is secured with an eye screwed into a composition, filling a slot in the stonework. The composition, which is of a reddish-brown colour, requires renewing. Where is it obtainable, and how is it applied?"

The composition may have been red lead, at any rate that is the only substance that occurs to the writer as answering the description. The best way to renew the fastening would probably be to pick out the composition and run the screw in with molten lead.

HENRY ADAMS.

Domestic Hot Water Arrangements.

ASHTON-ON-MERSEY.—F. J. A. writes: "I have recently been troubled with the hot-water circulation at my house. Every time hot water was drawn in bathroom, when it was turned off at all quickly, the exhaust pipe over the cistern started running, causing the cistern to overflow at the tell-tale. Please advise as to remedy. A diagram is enclosed [not reproduced]."

The cause of the overflow is the lack of space or length of pipe in which the momentum of the flowing water can spend itself when the tap is quickly closed. Closing the tap slowly will slightly improve matters; but the best way is to fix a coil of pipe, say, 8ft. long, to the expansion pipe at a level above that of the water in the cistern when full, and attach the ∩ bend to this in the usual way. The coil may be helix, volute, or spiral, but should not be less than 6ft. long. When you disconnect the pipes, you will see that the water in the expansion pipe keeps to the same level as that in the cistern. Another way is to put a large bulb, big enough to get your fist inside, and a foot long, on the expansion pipe above the level of the water in the cistern, and make the ∩ bend of 1¼in. bore; make the ∩ as high as possible. It is the momentum of the flowing water that is the cause of your trouble. The static pressure at the bath tap is due to the difference between the level of the water in the cistern and the level of that in the tap; in your case say 5ft.; and the free flow due to this height should be 18ft. a second, but friction and bends will reduce it to perhaps 5ft. The momentum is the product of mass and velocity, or in homely though not quite so correct words, weight and speed, pounds × feet per second. There is 50ft. of ¾-in. pipe each between cistern and cylinder and cylinder and bath, and all the water in this is moving 19lbs., a considerable weight. If the speed be only 4ft. a second (which will surprise you when you see it run out of a plumb glass tube), the distance between the top of the water in the cistern (which is that in the expansion pipe) and the top of the ∩, perhaps 10in., is too little for the momentum of water in 100ft. of pipe. Your suggestion for a complete circulation is good, but you must remember that when a tap is opened, water flows to it from all directions, as a rule. Momentum has to do with it, and friction and bends also. If the area of the pipe from the junction of cold water and return hot-water be greater than that of the two pipes, you should have success. In any case, the two pipes should meet like a V towards the one pipe. The job requires a brass casting like an injector, though lead pipe can be worked to the shape. If the hot reservoir be higher than the tap, there is always a static pressure to force out the hot water, and if the tap be above the junction of cold with the returning hot, there is static pressure of hot against cold also at the junction; but I do not think you will get satisfaction unless the single pipe be equal in area to the two combined. Your best plan is to remove the 20-gallon cylinder to the bath-room, disconnect kitchen sink from present hot flow, and get a new 5 or 10 gallon cylinder for the kitchen. The present hot pipe from bath to cylinder can be used to connect to new kitchen cylinder, whose bottom should be on a line with the boiler top. This new cylinder needs 3 branches at the bottom, one for cold supply, two for boiler flow and return, and one half-way up the side for hot return from scullery. Fix the old cylinder either plumb or level as space allows in the bath-room, and connect it to the bath and bowl taps. Let these be as direct on to the main pipe as can be, so that hot water can be drawn at once. Fit the expansion coil, 2ft. long, at a higher level than cold cistern. Connect cylinder by new pipe to kitchen sink and to scullery sink, and then to the new kitchen cylinder. A complete hot-water circuit is thus made, hot water can be drawn more quickly, two taps opened at once will both flow full bore, and the momentum caused by opening a tap is spent in quickening the circulation. Not less than 30 gallons is a proper hot-water reservoir for a £30 house in either Palatinate. The ratio of cold reservoir to hot reservoir does not affect the working of the hot-water supply. The cold one should hold as much water as the household needs during the periods when the main is shut off. The ratio of hot reservoir to boiler may be 12 to 1. The ratios of cubic content of fire to those of boiler and of cylinder, make the complete set to ascertain. INGENIOR.

Sewage Works for Small Town.

CREDITON.—"URBAN COUNCILLOR" writes: "Kindly express an opinion as to the possibility of successfully employing a triple settling tank for the partial treatment of the sewage of a not very opulent Devonshire town. The amount of sewage is estimated at 40,000 gals. per diem. For many years the sewage has flowed in an open brook for about a mile direct to a river, and during six months of the year the adjacent landowners are utilising the sewage for irrigating the meadows, and for the remainder of the year the course of the sewage is confined to the aforesaid brook, and in a certain low place where the flow is sluggish, the smell has given annoyance to the owner of an important country house adjacent. It is not possible to increase the fall at this point, and the urban council are desirous of doing what they can to minimise the nuisance. Of course they wish to overcome the difficulty as economically as possible, and it has been suggested that a settling tank of the character described would effectually break up most of the solid matter, and the effluent would be fairly inoffensive. It is further suggested that, as all storm water finds its way into the town sewers, a by-pass with weir and screen should be constructed, so that in times of flood only the usual quantity of sewage should enter the tanks, and the flood tide should join the effluent at the present course in the brook. It is considered that the rush of storm water through the brook would scour it sufficiently to prevent any nuisance. If you will kindly criticise these remarks and help with any suggestions, I shall be grateful."

—The triple settling tank shown in the sketch [not reproduced] is apparently intended to act as a septic tank, but considerable alteration is necessary in the design. The partition walls should be built to water level only, where they would act as weirs, and scumboards should be placed on each side of them about 2ins. away, so as to cause the sewage to enter and leave each division of the tank at a depth of about 18ins. Scumboards should also be similarly placed about 12ins. in front of the main inlet wall and 2ins. from the main outlet wall. The water level should be at least 12ins. below the incoming sewer. A tank constructed in this way would break up most of the solid matter, of which 25 per cent. would remain in the tank, and the remaining 75 per cent. be carried away in a finely divided state suspended in the effluent, which will be a dark coloured, evil-smelling liquid. The only advantage to be derived from the employment of such a tank by itself would be that it would prevent unbroken excreta being discharged into the stream, although it is only half the size, it should be if forming part of a complete purification scheme. Perhaps the nuisance could be minimised by conveying the sewage past the important country house in pipes laid along the bed of the brook. The rush of storm water along the brook would not be materially affected whether it first went through the tanks or through a bypass adjoining them. Storm water scours out the sewers, and washes off foul matter from the surface of the roads, and is practically as objectionable in character as the sewage itself. The Local Government Board would not sanction the raising of a loan to pay for the proposed work, owing to its incompleteness, so that the whole cost would have to be borne by the rates in one year. If the whole of the population of 4,000 drains through this sewer, the daily flow is probably underestimated at 40,000 gals. per day. It would be far more satisfactory, and cheaper in the end, to construct a complete and properly designed scheme. It is impracticable to give details here of a complete scheme, which could be guaranteed to prove satisfactory, as so much depends upon a full and proper appreciation of the particular local conditions, and the skill displayed in the methods adopted to meet them, it being found that a system may give good results in one place and be a comparative failure in another. Generally speaking, it should consist of a screen, detritus tank, storm-water-diverting chamber, sewage tank, stand-by tank for storm water, and aerating beds. Certain broad recommendations are laid down in the fifth report of the Royal Commission on sewage Disposal.

HENRY ADAMS.

Building Infested with Earwigs.

BERWICK.—J. S. C. writes: "I should be much obliged if you could give me information as to how to destroy or prevent the accumulation of earwigs in a building. The building which they infest is a small hotel, built on a stiff glacial clay, which I don't think had been turned over for some time before the building was erected, and it stands quite free from trees or shrubs of any kind. All the usual means of killing the insects have been tried, but still they are there in thousands."

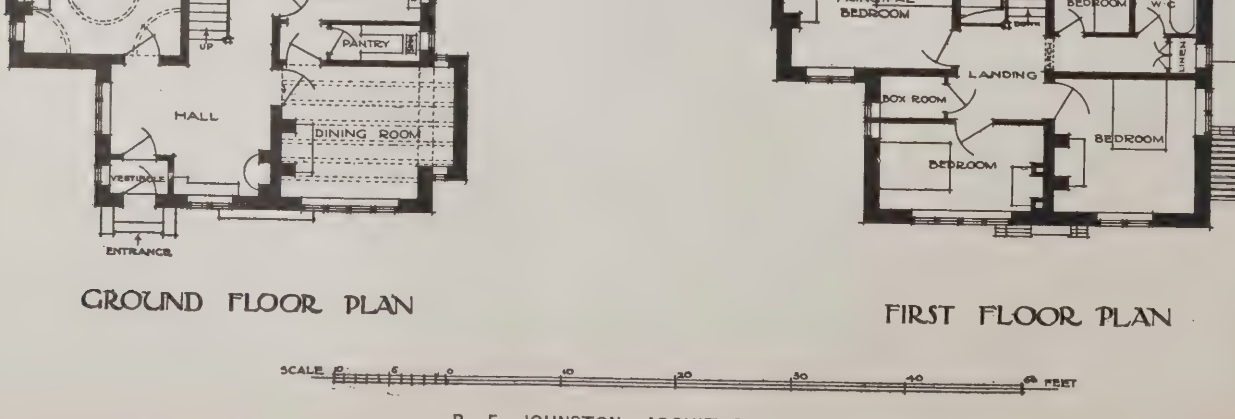
—The most successful method that I have ever known to be employed for mitigating this pest is to hang up pieces of hollow bamboo, or something of that character, in order that the insects may crawl into them—as is their natural habit—then every morning the canes are shaken into buckets of boiling water, and many thousands are thus very quickly destroyed. Dry artichoke canes were used in a case of which I have knowledge, and the result was excellent. F.S.I.

Question of Dilapidations.

WALES.—ARCHITECT writes: "Window frames, sashes, and door frames are decayed. Who is liable for their repair or replacement under the usual terms of a repairing lease?"

—Window frames, sashes, and door frames form a necessary portion of the external fabric of the building, and under the terms of your lease their repair will fall upon the lessor. I much doubt, however, whether he is in any degree liable for any replacement, even if they are thoroughly worn out, because, in the absence of a special covenant to the contrary, a landlord may allow his property to fall down and still be legally justified in demanding his rent. There is no law to compel any owner to repair his premises (except in the case of working-class houses). The internal painting and repair of the windows, etc., etc., of course fall upon the lessee. F.S.I.

HOUSE AT HARROW
FOR JOHN HARVEY ESQ



GROUND FLOOR PLAN

FIRST FLOOR PLAN

R. F. JOHNSTON, ARCHITECT.

CONCRETE AND STEEL SECTION.

(MONTHLY.)

"Applied Mechanics."

The number of books on the subject of applied mechanics is very considerable, and therefore we think it incumbent upon any author who issues a new book on this subject to see that it contains a good deal more than earlier works, and treats the subject much more clearly and thoroughly. There is much that is useful and commendable in Professor Hancock's book, but it does not completely capture us. The book will be found useful by junior engineering students. No doubt it provides a good course of training, but it does not say much that is new, and, in our opinion, it is not framed upon such good lines as some other books which have been written more for the practical engineer. It is desirable for books on engineering subjects to be so arranged and written as to be easy of consultation by the engineer in practice. Such books are quite suitable for the student, and, indeed, better, because, if the student becomes well acquainted with a book, he will use it afterwards in practice. To consult this work for guidance on any point that may arise is not very easy nor speedy, and the work inclines rather too much to the theoretical aspect. It is very important that books for engineering students should be written with an eye to practice. Theoretical training is all very well, but it often obscures the straight issue. The writers of textbooks should have had considerable practice, and their books should be so compiled as to serve as constant aid-books in practical work afterwards, as well as sure guides to practical as well as theoretical training in the student. Perhaps, however, the chief value of this work will be in the suggestions that it offers to others who may follow, for no doubt much of the matter in it would be commendable if it could be embodied in a form more ready of assimilation by the engineer in practice.

"Applied Mechanics for Engineers." By E. L. Hancock, Assistant Professor of Applied Mechanics, Purdue University. New York: The Macmillan Company. Price 8s. 6d. net.

Mechanics of Materials.

This book, by C. E. Houghton, is obviously a work for elementary students, and we do not quite see its particular advantage over other works on the subject. It provides very little that is new. It might be useful as a class-book, but it is only an introduction to the subject, and that can be obtained from many other books which, at the same time, deal with more advanced problems. We are not much in favour of separate textbooks on the elementary aspects of engineering subjects. We are inclined to the opinion that it is better for a student to have a large and thoroughly serviceable book which will stand him in good stead, not only throughout his college course, but afterwards in practice. Mr. Houghton's book might very well be used, however, in conjunction with other published books, that are somewhat deficient in respect to elementary information. It is very clearly written, and is very commendable so far as it goes.

"The Elements of Mechanics of Materials." By C. E. Houghton, A.B., M.M.E. London: Archibald Constable and Co. Price 7s. 6d. net.

The Design of Arches.

The theory of the design of arches has made considerable progress in recent years, and this is due to the better understanding of the elastic theory, and may be attributed in great part to the publication of excellent and simple treatises by Prof. Howe and other American authors. The determination of stresses in arches is not easy, and in arched bridges of stone or brick the stresses are almost indeterminate. The modern elastic theory is no doubt correct when applied to solid steel ribs having a depth which is comparatively small when compared with the radius of curvature, and when the loading is applied at isolated points through vertical posts which are unbraced in the plane of the rib; in fact, the modulus of elasticity of steel is fairly constant, and the material is capable of resisting pretty equally both tension and compression, which facts render the determination of the stresses easier and more correct. For steel arched ribs, therefore, this theory is about as correct as the ordinary theory for steel beams.

Stresses in Natural Stone.

When, however, we begin to apply the theory to natural stone we find some difficulties. The material is not reliable in tension. This is particularly true of the joints between voussoirs. Furthermore, the modulus of elasticity in direct compression is variable, and not definitely variable, though within certain limits it may be considered without serious error as being constant. It seems to be accepted, therefore, that the elastic theory may be applied so long as the equilibrium polygon lies within the middle third of the arch ring, that is to say, so long as every section or joint is subjected to compressive stresses. The theory is also applicable when the equilibrium polygon lies within the arch ring, provided the compression is not sufficient to crush the material. Though we should suppose a masonry arch would fail when the equilibrium polygon passed without the ring at any joint, yet in practice we find that this does not always happen, the reasons being found in various causes, the chief of which is that the spandrels of masonry arches are usually filled in so that the arch ring is not allowed to open because of the clamping of the ring between the solid spandrel walls and a mass of backing of varying thickness. The spandrel filling, indeed, prevents a change in the shape of the rib to any great extent. Another reason is that in bridges having a considerable depth of side wall above the crown, a large portion, if not all, of the ring under these walls might be removed in many cases without complete failure, the wall forming an arch in itself. For such a variable material as masonry, however, we ought to employ a larger factor of safety, and it is customary with stone bridges to adopt a factor of ten.

Concrete Arched Ribs.

In plain concrete arched ribs the material is as variable in its modulus of elasticity as stone; in concrete arches, however, we have no joints to consider, nor do we have masonry spandrel backing, though we generally have present monolithic spandrel side-walls, and often spandrel tables which clamp the rib. Concrete cannot be depended upon to resist tensile stresses, and it is usual with plain concrete to provide for a factor of safety of ten upon the compressive strength. Numerous concrete arch bridges have been built with three hinges, and this arrangement has proved to be thoroughly satisfactory in practice, and in some cases the pressure curve has passed outside the arch without failure resulting, the spandrel walls acting as before mentioned in the case of stone arches, namely, preventing the arch ring being distorted sufficiently to cause failure.

Reinforced Concrete Arches

Reinforced concrete is, however, a very much superior material to plain concrete; it is much more reliable. Instead, therefore, of there being the desirability of employing a large factor of safety, we can reduce this to about four or five. The modulus of elasticity of reinforced concrete is pretty uniform, the only difficulty we have in reinforced concrete arch design is the determination of the position of the neutral axis. In reinforced concrete arches, the design is often complicated by the varying moment of inertia. The manner in which this is dealt with is now fairly well known, and can be studied from several text books.

The Neutral Axis.

The location of the neutral axis of a reinforced concrete section no doubt shifts under the action of different loads. In the elastic theory it is assumed that the arch axis passes through the neutral axis of each section of the rib, so that we assume the axis to lie at the centre of curvature of the section, and we treat the material by the common theory of flexure. In a reinforced concrete rib there is no absolute reason why we should never subject the arch ring to tension, but it seems to be the usual practice with designers to avoid this, and keep the pressure curve within the arch.

The Pressure Curve.

The pressure curve, or, as it is often called, the linear arch, is comparatively easy of determination with a plain concrete or masonry arch. The equilibrium polygon, which constitutes the pressure curve, is easily drawn. It is obtained by plotting a load line and choosing a pole and drawing vectors thereto, then on an elevational diagram drawing lines parallel with the vector lines from and to their points of junction with the load lines extended. A trial equilibrium polygon will perhaps not have the correct base line. We then require to chose a new pole, so that we can make the polygon pass through given points. If we make it pass through two given points, we fix the base line, but we do not determine the vertical height of the equilibrium polygon above the base line or springing line. When we fix three points, however (namely, the two springings and the centre), we can exactly determine the curve of the equilibrium polygon; and in plain concrete arches, and in some stone arches, the customary practice is to adopt three pivots or hinges so as thus to fix definitely the position of the equilibrium polygon or pressure curve within the arch. In steel work and reinforced concrete, and in some cases of plain concrete arches, we, however, often meet with a different condition: the arch may not have hinges, while at the same time it may, perhaps, be fixed at the springings. In that case we meet with some slight difficulty, for in order to obtain a starting point for the construction of our linear arch, it is necessary to know the amount, direction, and point of application of one joint pressure, and we may not know completely the one joint pressure—indeed, there may be no joint.

The Equilibrium Polygon.

The linear arch, as a term, may be defined as that particular equilibrium polygon which coincides to the pressure line, and the problem is to determine the equilibrium polygon, so that it shall coincide with the pressure line. Considering that in order to determine exactly the equilibrium polygon we must have three conditions specified, such as, for instance, three points through which the polygon must pass, the theory of arches has been a subject of controversy. The theory, however, which has received general acceptance is that of the principle of least resistance, introduced in 1837, by Moseley, an English engineer, whose work was translated into German by Scheffler, through whom the theory was chiefly promulgated. We may explain this theory by a simple example. Supposing we build an arch, as we generally do, upon a wooden centre, we will assume that when this latter is removed it is not removed suddenly, but is gradually lowered so that the arch becomes self-supporting by degrees. In this event the horizontal pressure or thrust at the crown gradually increases until the centre has been completely removed, when it has its least possible resistance. This hypothesis of the least crown thrust consistent with stability is Moseley's principle of least resistance. In constructing an equilibrium polygon, the horizontal base or pole distance is least, with the height of the polygon a maximum; therefore, in order to apply the principle of least resistance, the equilibrium polygon must pass through the highest point of the extrados of the crown and the lowest point of the intrados of the abutments. Such a distribution, however, would be incompatible with stability, and this early theory has given place to a more rigorous one from a mathematical point of view. We now regard it from the modern theory of elasticity, and we apply the principle of least work. The position of the linear arch is determined by Castigliano's theorem, which is that for stable equilibrium the work of deformation must be a minimum.

Winkler's Criterion. Though Hooke's law of elasticity is not strictly true for any material, it applies more or less to all, and we know that in deforming materials work is done, consequently we have to find the point at which the work of deformation is least. It is not necessary for us here to go into the complete mathematical discussion of the equation for the determination or the stability of an arch; it is sufficient for our purpose to refer to Winkler, who showed in 1879 that if for any given arch it were possible to draw an equilibrium polygon which should in every way lie within the middle third of the arch ring, then stability was assured. If we can design an arch so that we make the equilibrium polygon for the given system of loads the centre line of our arch, we secure the maximum efficiency, but we may be limited as to the curve of an arch, and therefore the equilibrium polygon will be different from that of the centre line of the arch. The usual method then is to draw various equilibrium polygons until one is found which keeps within the middle third of the arch, the thickness of the arch ring being altered, if necessary, so as to permit of this. In that way stability is assured. We often, however, see arch ribs employed in steel work—and they are now beginning to be employed in reinforced concrete, in which the construction is more in the nature of a curved beam, and the pressure curve does not lie within the arch. In short, the arched rib of metal and of reinforced concrete is capable of resisting bending moment, and it is this which forms the fundamental difference between the arched rib and an ordinary arch of plain concrete or stone. Arched ribs are usually constructed in three ways: (1) hinged at the abutments and at the crown; (2) hinged at the abutments and continuous throughout; (3) fixed at the abutments and continuous throughout.

The Three Methods. The method of drawing the equilibrium polygon differs for each of these three methods of support. In the first case, as the equilibrium polygon must pass through the three hinges it is completely determined. In the second case, a third condition is necessary to make the problem determinate. In addition to the vertical reaction we need to apply horizontal reactions, which we may call P_h. This will be the same as the pole distance of the force diagram. The calculation for determining P_h is as follows:—

$$P_n = \frac{\int \frac{M_p\, z}{E\, I}\, ds}{\int \frac{z^2}{E\, I}\, ds}$$

M_p = moment of forces on left of any point in the arch axis, Z = the perpendicular distance of P_h from the point in question, E = modulus of elasticity, I = moment of inertia, and dS = distance of two points apart.

E is usually constant throughout the rib, consequently we may ignore this, and the equation reduces to:—

$$P_h = \frac{\int \frac{M_h\, z}{I}\, ds}{\int \frac{Z^2}{I}\, ds}$$

It is usual to make $\frac{ds}{I}$ a constant by splitting the arch ring up into portions of different lengths. The loads may then be assumed to be applied at the centres of each section and vary in amount. This done, it is a simple matter to calculate the horizontal reaction or the pole distance, from which we can strike the vector diagram and draw the equilibrium polygon.

Fixed or Continuous Arch Rib. In a fixed arch or a continuous arched rib, we have a somewhat more difficult case, and reference can be made to the works on the subject of arch design for a detailed consideration and for methods of the solution of such problems. It may be finally added that it is possible to treat beams of irregular shape by analysing them as arches, and, indeed, to treat arches by analysing them as beams; and it may be found advisable in some cases to do this. Whichever way we work round, we should obtain the same results in our analysis. Which is the best procedure to adopt will depend upon the particular circumstances of each case. In general, it is not so easy to determine the stresses by means of the arch theory as by the beam theory, therefore, engineers endeavour as far as possibile to calculate peculiarly shaped beams as beams and not as arches, but we can often see more clearly the correct solution by considering the problem from the arch point of view. In that case, however, we are often compelled to consider various cases of loading, as, for instance, irregular or moving loads. We may find that some peculiar instances in which structures designed by one method have shown extraordinary resistance are explainable by a reference to the arch theory, and it is not quite clear always which method of calculation will give us the best result. We may be sure, however, that the structure, however it is built, will act in the most favourable manner, i.e., that the principle of least work will come into play. This explanation of the peculiar results sometimes obtained in practice shows us that it would be advisable often to look at the problem of design from different points of view, in respect to these structural elements, in short to consider the possibility of a beam acting as an arch and *vice versa*.

POINTS ABOUT SHEAR STRESSES.

There seems to be insufficient attention paid as a rule to the design of beams subject to shear stresses. We often find beam constructed which are very deficient in the number of shear stirrups, and there have been a few instances lately where building have developed considerable cracks due to these shear stresses, and have had to be strengthened and partly reconstructed.

Somewhat strange to find, American engineers sometimes state that shear reinforcements are not necessary in beams. Certainly, a few tests have appeared to sugges that beams without such diagonal reinforcements resist loads as well as those with them but there are many more tests to prove the contrary. Shear members are indeed extremely important. T beams particularly require treatment, and as the ribs of these T beams are often very narrow, not only have we to consider shear stresses within the leg of the T, but also at its point of connection with the slab, both horizontally and vertically. It is well to have plenty of shear members to fix the leg to the table, and also the rods in the slab should be run into the beam to give this security on the vertical planes of attachment, because otherwise the resistance of the table of the T cannot be developed, indeed, the width of the table which can be taken into account in calculating this moment of resistance of a T beam is dependent upon the shear resistance of the planes of connection both horizontally and vertically. If the leg is made very small, then the secondary reinforcement should be correspondingly increased.

The methods of treatment of such shear reinforcements have been discussed in many text-books. The shear reinforcements are provided in several ways, and the methods of calculations for the various kinds are somewhat different. For instance, in some systems the main tensile reinforcements are cranked up as the supports are approached where the bending moment is reduced, so that they can be removed from acting in direct tension. In these cranked main rods a great deal of the shear is picked up; indeed, one may say roughly, half of it is resisted by them because, as a rule, about half the main rods are bent up in this way.

Where shear members are rigidly attached to the main reinforcements, there is no reason to fear slipping, nor is there any particular reason to fear a bond failure due to deficiency in adhesion between concrete and steel.

There is another type of beam reinforcement, in which a number of small bars are used, and these are gradually turned up to provide the shear members. This is only an extension of the method first referred to, but the difference lies more particularly in the fact that the inclined reinforcements in the first method extend from almost ⅓ points of the span to the top of the beam directly over the supports, so that the angle which they make with the horizontal is roughly about 30 degrees, whereas in the second method the rein-

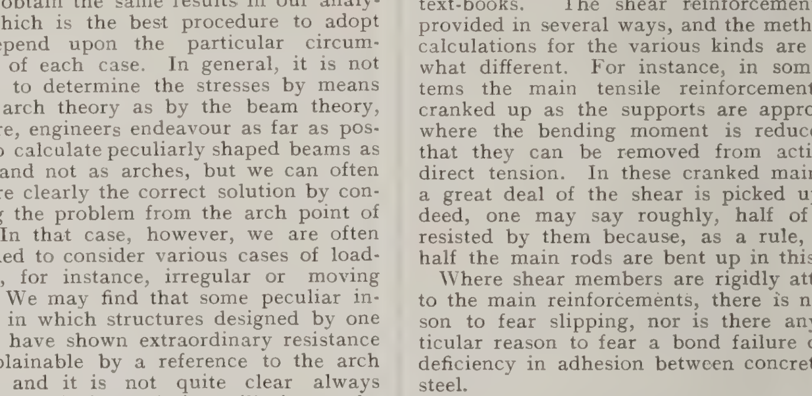


DIAGRAM ILLUSTRATING SHEAR STRESSES.

forcements are bent upwards at about 45 degrees, and do not extend to the supports.

In a third method the special bars have parts thereof sheared and turned up at 45 degrees.

In a fourth method, and, perhaps, the most general method, if not exactly the earliest, the shear members are separate from the main reinforcements, and are linked round or attached thereto. These reinforcements are in some cases placed at angles of 45 degrees, but more generally are placed vertically within the beams. There is some little contention between the advocates of the inclined and vertical stirrup as to which is the best position. As the concrete tends to crack on lines approaching 45 degrees, the most direct action is thought to be to cross these lines at right angles with stirrups, making another angle of 45 degrees with the main bars. Other advocates, however, claim that although this may be the most direct action, the vertical stirrups are more effective in a secondary action, which is that when the concrete is cracked, one part of the beam tends to drop down below the other, and this vertical deformation is prevented by the vertical stirrups suspending, as it were, the main bars back in position. It may, however, be argued that after all the vertical stirrups can be considered as filling the most natural and direct position, because vertical stirrups cross more planes of principal stresses and serve to curve these lines of principal stresses into the normal position, which is to make junctions at 45 degrees with the main reinforcements. The angle of 45 degrees is arrived at by consideration of the fact that the strength of concrete in tension is ignored in our calculations by general acceptance; this is not actually a fact, but if we neglect the tension in theory, our calculations must provide for neglecting it in shear, and the 45 degrees inclination then becomes the correct one.

Though a few persons seem inclined to argue that the vertical stirrup does not slip upon the bar if it is not rigidly attached thereto, the more general consensus of opinion is that in most beams there are points at which the vertical stirrups require rigid attachment to prevent them sliding, the argument being that as the change in the bending moment along the tensile reinforcement is distributed across the beam by means of the concrete, then the means whereby this distribution takes place must be the adhesion between the concrete and the steel, therefore, the rate of change of bending moment is a measure of the adhesion that requires development, and it will be found that most beams, at any rate, of any ordinary span and with any ordinary loading, will require a rigid attachment of shear members somewhere near the supports, as otherwise the adhesion stress will far exceed the limits which authorities suggest as conservative, and would cause a slipping to take place, in which case the shear members would become ineffective.

The subject of shear stresses is, however, an intricate one, and there is room for more detailed study in this connection. For instance, other points that require observance are that the stirrups shall have some mechanical hold in the concrete in order to develop their strength, as otherwise, being of such short length they would often have to pull through the concrete before they could develop the resistance of the section of metal that is given to them.

As regards the question of bond, or adhesion, stresses, these are complicated by questions of shear, and there are several schools of thought in this respect. One, for instance, claims that it is unwise to rely upon any adhesion, and it is advised in order to obtain a mechanical bond, to use one or other of the deformed bars on the market. Other patentees claim that there is no necessity, in many cases, to use such deformed bars, which cost an increased price beyond that of ordinary round or square bars, and contend that even if they are used it does not prevent the concrete shearing between the deformations because, it is argued, the shear resistance of the concrete is, in most regulations, put at less in amount than the adhesion between concrete and steel. Others again point out that if the shear members are rigidly attached to the main bars, not only is mechanical bond provided, but the matter of adhesion is not at all important, and is almost unnecessary, for the strength of beams reinforced with such rigid attachment shear members is fully developed, even if there is no concrete below the main bars, the shear members and the concrete filling serving to provide a kind of lattice girder or truss.

The fact is, of course, that a thoroughly efficient job can be provided with any and all of the different methods; the only question we have to consider is (1) as to whether the systems are properly applied with full knowledge, and (2) which is the most economical in any particular case. It may be, and, at any rate, at present can be almost safely said, that none of the systems is the best and will meet all cases. The best method is to employ a combination of systems, if we may so call it, and the designer should give himself plenty of latitude and not restrict himself to any hard and fast methods.

We append a few simple rules for the calculation of shear stresses in ordinary cases, these rules being those which meet with most usual acceptance:—

Using the standard notation of the Concrete Institute, in which

S = total shearing force across any section.
b = breadth or width of rectanguar beam or of rib of T beam.
d = effective height or depth.
kd = depth to neutral axis.
t = unit tensile stress in steel.
A_T = area of steel in tension.
A_S = area of steel in shear.

If S is the shearing force at any point of a beam, the maximum shearing resistance

$$\frac{S}{b\,d\left(1-\frac{k}{3}\right)}$$

If this exceeds 100lbs. per sq. in., the beam needs reinforcing against shear stresses.

When bars are cranked up, S is reduced by $t\,A_T \operatorname{Sin} \alpha$, where α is the angle of the bars to the horizontal. The maximum shearing resistance then becomes

$$\frac{S - t\,A_T \operatorname{Sin} \alpha}{b\,d\left(1-\frac{k}{3}\right)}$$

If shear members are employed they are usually calculated to resist the whole of the shear stresses. If inclined at an angle β to the horizontal

$$As = \frac{S}{t \operatorname{Sin} \beta}$$

or when some of the tensile rods are cranked up,

$$As = \frac{S - t\,A_T \operatorname{Sin} \alpha}{t. \operatorname{Sin} \beta}$$

When shear members are placed vertically the section of metal is usually kept uniform and the spacing varied. The spacing is determined by plotting the diagram of bending moments, dividing its maximum ordinate into equal parts, so that the distance from the supports to the first shear member does not exceed half the depth from centre of compression to centre of tension, and drawing through each of the points so found a line parallel to the closing line of the diagram; where these lines cut the curve, verticals are drawn and give the positions of the shear members. This method is shown in diagram. The section of the metal is then determined for the vertical nearest the support by finding the bending moment B at that point, considered in all cases as a freely supported beam. Then:—

$$As = \frac{B}{t\,d\left(1-\frac{k}{3}\right)}$$

There is also a shearing or slipping along the horizontal reinforcements to be considered. The shearing stress around the bars $= \frac{S}{O\,a\left(1-\frac{k}{3}\right)}$, where O = total perimeter of bars. If this shearing stress exceed 100lbs. per sq. in., the shear members should be rigidly attached to the longitudinal bars, which should also have their ends split or bent to lock into the concrete.

Views and Reviews.

The Calculus.

The Calculus is a subject which is always difficult to the beginner in mathematics. It is so very important to the student in engineering, however, that many books have been published, designed to give him a working acquaintance with the calculus in the shortest time and with the practical application of mathematical theory. The author of this book acknowledges his indebtedness to Professor Perry, whose book on this subject is well known. This book is very clearly written, and the examples are all of practical application, and to this end a large number of problems have been fully worked out. We can highly recommend this book to students of the subject.

"The Calculus and Its Application." By Robert Gordon Blain, M.E., Assoc.M.Inst.C.E. London: Archibald Constable and Co., 10, Orange Square, W.C. 4s. 6d. net.

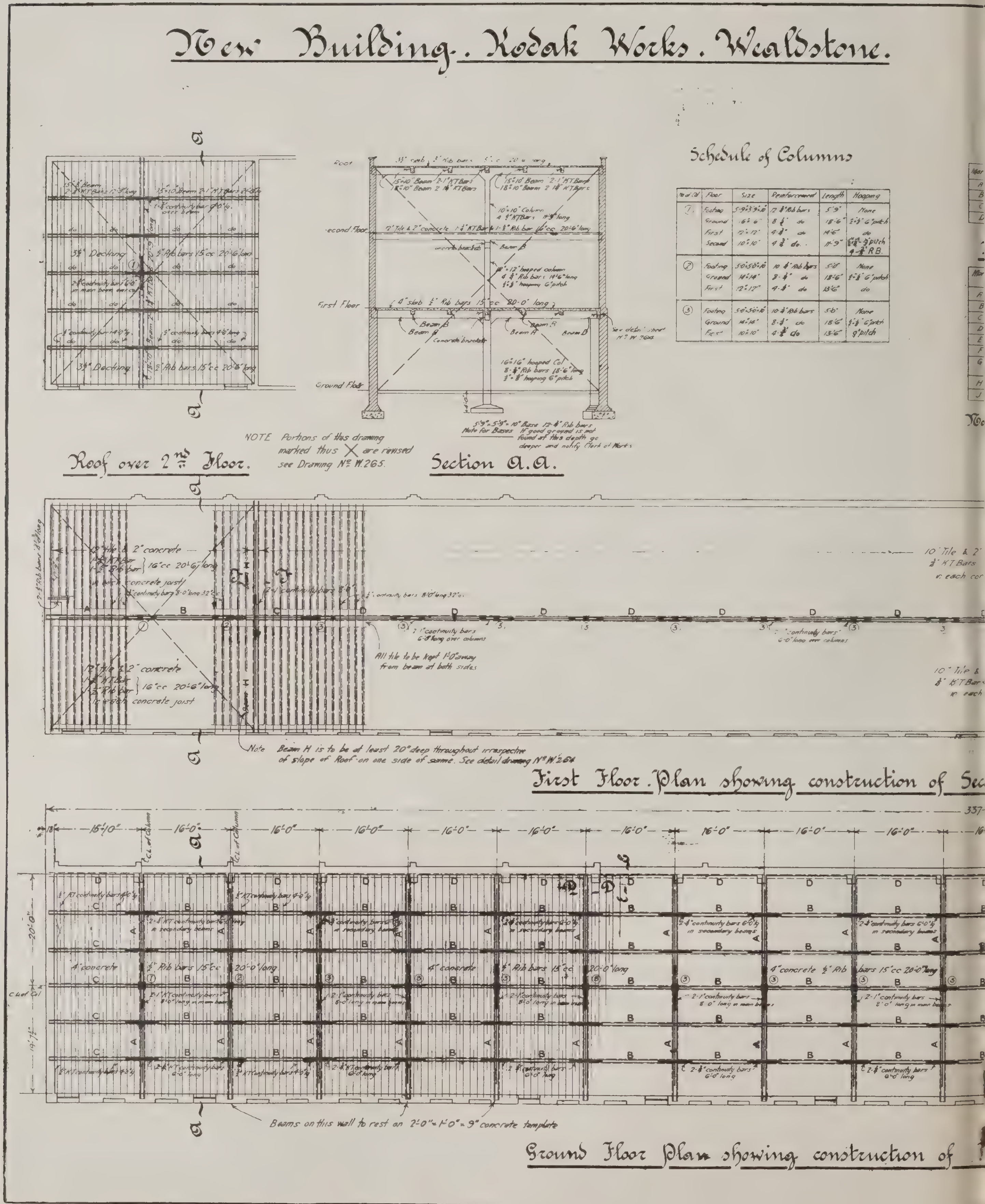
A FACTORY IN REINFORCED CONCRETE.

In this issue we reproduce some of the working drawings, together with a photograph of a factory which has been constructed in reinforced concrete at Wealdstone, near Harrow, for the Kodak Company, Limited. The reinforcement throughout consists of Kahn bars supplied by the Trussed Concrete Steel Company, Ltd., of Caxton House, Westminster, who are responsible for the engineering design. The architect was Mr. Simon Victor Hause, works manager, Kodak, Ltd., and the contractors were Messrs. D. G. Somerville and Company. The building is an interesting example of a form of construction which is used considerably in the United States, but is not so well known in this country. It consists of a floor with a level ceiling formed of hollow terra-cotta blocks embedded between ribs or small beams of reinforced concrete, the filling over the blocks forming practically a slab and converting the ribs into T beams. The working drawings show various details of the construction, and well illustrate how the system is applied—in fact, the construction. A level ceiling is often needed, and is particularly desirable in a building of this character, where the ventilation must be good and no dust can be allowed to collect on or drop from the ceilings. These floors are fairly lightly loaded, but the system can be applied to the construction of floors required to sustain a much heavier load. The centering required for such a type of floor construction is not so heavy as for ordinary slabs and beams; the boards need only be placed under the soffit of the reinforced concrete ribs with the hollow blocks resting between, the steel first having been placed in position between the rows of blocks; the filling is then poured in position over all. The centering, therefore, on the whole, is readily and quickly erected, and easily removed.

Mr. A. W. Itter has given 50,000 bricks—carted free of cost—to the new King's College Hospital, now being erected at Denmark Hill.

* * *

Bath Street, Bath, concerning the demolition of which there has been such strong opposition, is now in the hands of the housebreakers.


New Building. Kodak Works. Wealdstone.
Roof over 2nd Floor.
Section A.A.
First Floor Plan showing construction of Sec
Ground Floor Plan showing construction of
3½" Decking
½" Rib bars 15" cc 20'-6" long
Roof
Second Floor
First Floor
Ground Floor
Beam A
Beam B
Beam H
4" concrete
½" Rib bars 15" cc 20'-0" long
16'-0"
20'-0"
19'-7½"
C.L. of Col
337'

NOTE Portions of this drawing marked thus X are revised see Drawing No. W.265.

5'-9" × 5'-9" × 10" Base 12-⅞" Rib bars. Note for Bases If good ground is not found at this depth go deeper and notify Clerk of Works

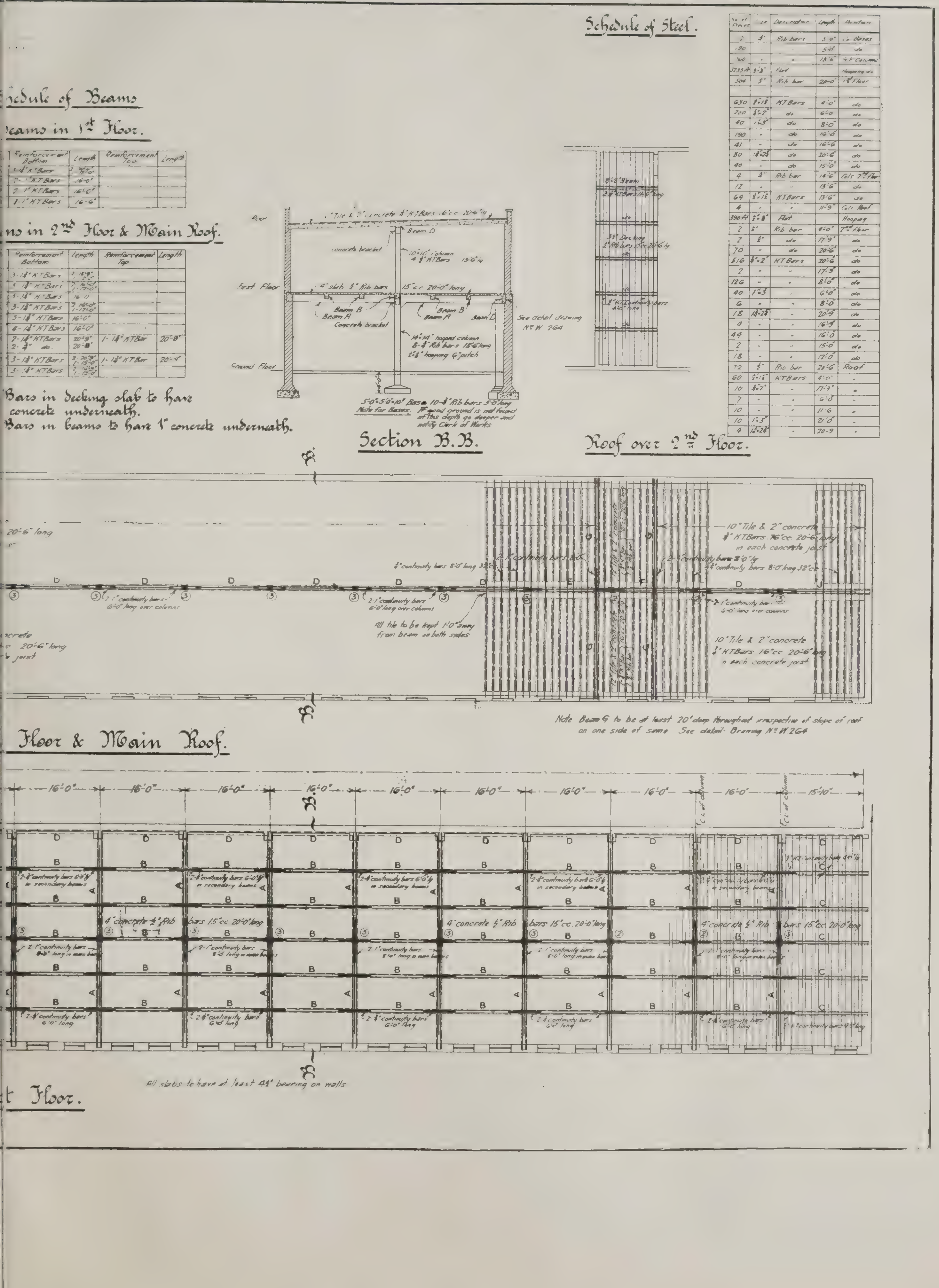
All tile to be kept 1'-0" away from beam at both sides

Note Beam H is to be at least 20" deep throughout irrespective of slope of Roof on one side of same. See detail drawing No. W.264

Beams on this wall to rest on 2'-0" × 1'-0" × 9" concrete template

Schedule of Columns

No. of Col.	Floor	Size	Reinforcement	Length	Hooping
①	Footing	5'-9" × 5'-9" × 10"	12 ⅞" Rib bars	5'-9"	None
	Ground	16" × 16"	8 ¾" do	18'-6"	½-⅜" 6" pitch
	First	12" × 12"	4·⅞" do	14'-6"	do
	Second	10" × 10"	4 ⅞" do.	11'-9"	[illegible] 9" pitch 4-⅜" R.B.
②	Footing	5'-0" × 5'-0" × 10"	10 ⅞" Rib bars	5'-0"	None
	Ground	14" × 14"	8-¾" do	18'-6"	½-⅜" 6" pitch
	First	12" × 12"	4-¾" do	13'-6"	do
③	Footing	5'-0" × 5'-0" × 10"	10-⅞" Rib bars	5'-0"	None
	Ground	14" × 14"	8-¾" do	18'-6"	½-⅜" 6" pitch
	First	10" × 10"	4-⅞" do	13'-6"	9" pitch


Roof
First Floor
Ground Floor
Tile & 2" concrete ¾" KT Bars 16" c.c. 20'-6" lg
Beam D
concrete bracket
10"×10" column
4 ⅝" KT Bars 15'-6" lg
4" slab ½" Rib bars 15" c.c. 20'-0" long
Beam B
Beam A
Concrete bracket
Beam B
Beam A
Beam D
See detail drawing
No. W 264
14"×14" hooped column
8-⅞" Rib bars 18'-6" long
½"×⅛" hooping 6" pitch
5'-0"×5'-0"×10" Base 10-⅝" Rib bars 5'-6" long
Note for Bases. If good ground is not found at this depth go deeper and notify Clerk of Works
Section B.B.
6"×8" Beam
2 ⅝" KT Bars 11'-6" long
do
3½" Decking
½" Rib bars 15" c.c. 20'-6" lg
do
2 ¾" KT continuity bars 6'-0" long
do
Roof over 2nd Floor.
B
20'-6" long
concrete
c.c. 20'-6" long
joist
D
D
D
D
D
D
E
F
J
D
G
G
G
G
③
③
③
③
③
③
③
②
②
③
2-1" continuity bars 6'-0" long over columns
2-1" continuity bars 6'-0" long over columns
All tile to be kept 1'-0" away from beam on both sides
¾" continuity bars 8'-0" long 32" c.c.
2-1" continuity bars 8'-0"
12" Tile & 2" concrete 1-¾" KT Bar 16" c.c. 20'-6" long 1-¾" Rib bar
2-1" continuity bars 8'-0" lg
¾" continuity bars 8'-0" long 32" c.c.
10" Tile & 2" concrete
¾" KT Bars 16" c.c. 20'-6" long
in each concrete joist
2-1" continuity bar 6'-0" long over columns
10" Tile & 2" concrete
¾" KT Bars 16" c.c. 20'-6" long
in each concrete joist
Note Beam G to be at least 20" deep throughout irrespective of slope of roof on one side of same. See detail Drawing No. W.264
Floor & Main Roof.
16'-0"
16'-0"
16'-0"
16'-0"
16'-0"
16'-0"
16'-0"
16'-0"
16'-0"
15'-10"
C.L. of Column
C.L. of Column
B.
D
B
A
C
2-¾" continuity bars 6'-0" lg in secondary beams
2-¾" continuity bars 6'-0" lg in secondary beams
2-¾" continuity bars 6'-0" lg in secondary beams
2-¾" continuity bars 6'-0" lg in secondary beams
2-¾" continuity bars 6'-0" lg in secondary beams
2-¾" KT continuity bars 4'-6" lg
4" concrete ½" Rib bars 15" c.c. 20'-0" long
4" concrete ½" Rib bars 15" c.c. 20'-0" long
4" concrete ½" Rib bars 15" c.c. 20'-0" long
2-1" continuity bars 8'-6" long in main beams
2-1" continuity bars 8'-6" long in main beams
2-1" continuity bars 8'-0" long in main beams
2-1" continuity bars 8'-0" long in main beams
2-1" continuity bars 8'-0" long in main beams
2-¾" continuity bars 6'-0" long
2-¾" continuity bars 6'-0" long
2-¾" continuity bars 6'-0" long
2-¾" continuity bars 6'-0" long
2-¾" continuity bars 6'-0" long
2-¾" continuity bars 4'-6" long
B.
All slabs to have at least 4½" bearing on walls
t Floor.

hedule of Beams

eams in 1st Floor.

Reinforcement Bottom	Length	Reinforcement Top	Length
3-1⅛" KT Bars	2, 16'-6" 1- 15'-0"		
2- 1" KT Bars	16'-0"		
2 1" KT Bars	16'-6"		
1-1" KT Bars	16'-6"		

ns in 2nd Floor & Main Roof.

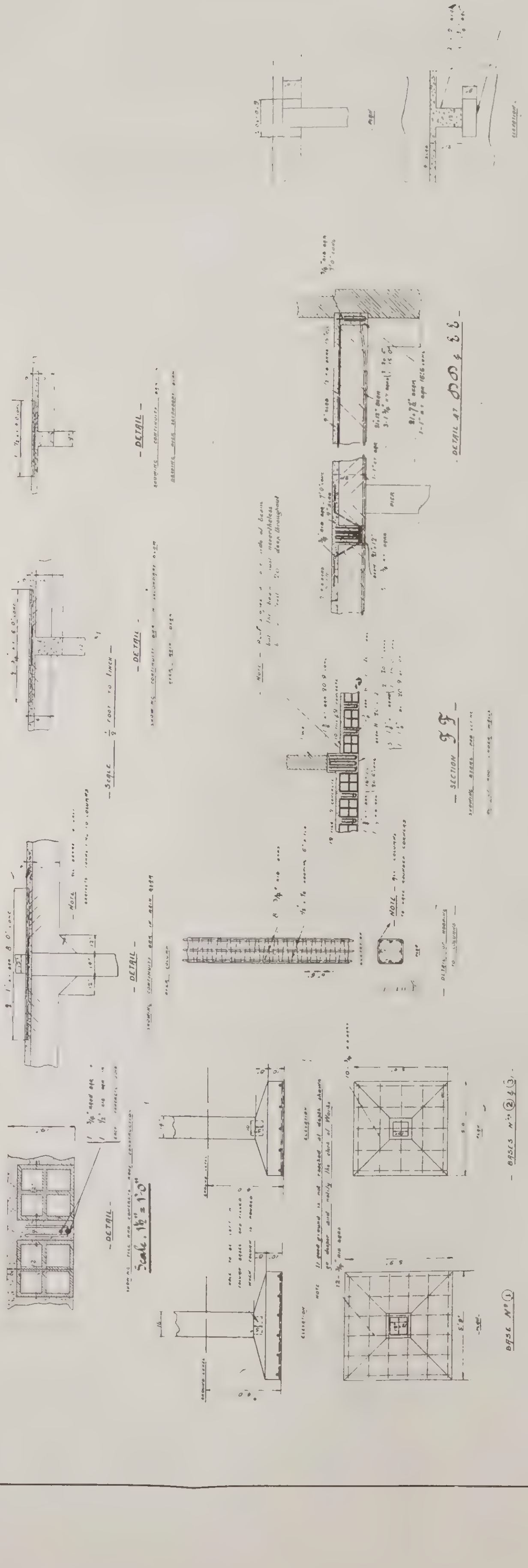
Reinforcement Bottom	Length	Reinforcement Top	Length
3-1⅛" KT Bars	2, 16'-9" 1, 7'-0"		
3 1⅛" KT Bars	2, 16'-0" 1-17'-0"		
5-1⅛" KT Bars	16'-0"		
3-1⅛" KT Bars	2, 16'-0" 1-12'-0"		
3-1⅛" KT Bars	16'-0"		
4-1⅛" KT Bars	16'-0"		
2-1⅛" KT Bars 2- ¾" do.	20'-9" 20'-8"	1-1⅛" KT Bar	20'-8"
3-1⅛" KT Bars	2- 20'-9" 1-15'-0"	1-1⅛" KT Bar	20'-9"
3-1⅛" KT Bars	2, 16'-9" 1-13'-0"		

Bars in decking slab to have concrete underneath.

Bars in beams to have 1" concrete underneath.

Schedule of Steel.

No. of Pieces	Size	Description	Length	Position
2	¾"	Rib bars	5'-9"	in Bases
190	-	-	5'-8"	do
160	.	.	18'-6"	G F Columns
3735 ft	⅛"×⅝"	Flat		Hooping do
504	½"	Rib bar	20'-0"	1st Floor
630	½"×1½"	KT Bars	4'-0"	do
200	⅝"×2"	do	6'-0	do
40	1"×3"	do	8'-0"	do
190	"	do	16'-0"	do
41	-	do	16'-6"	do
80	1⅛"×2¼"	do	20'-6"	do
40	-	do	15'-0"	do
4	¾"	Rib bar	14'-6"	Cols 2nd Floor
12	-	-	13'-6"	do
64	½"×1½"	KT Bars	13'-6"	do
4	.	.	11'-9"	Cols Roof
390 ft	½"×⅛"	Flat		Hooping
2	½"	Rib bar	4'-0"	2nd Floor
2	½"	do	17'-9"	do
70	-	do	20'-6"	do
516	⅝"×2"	KT Bars	20'-6"	do
2	-	"	17'-9"	do
126	"	.	8'-0"	do
40	1"×3"	.	6'-0"	do
6	-	-	8'-0	do
18	1⅛"×2¼"	-	20'-9"	do
4	-	-	16'-9"	do
44	-	-	16'-0"	do
2	"	"	15'-0"	do
18	-	.	12'-0"	do
72	½"	Rib bar	20'-6"	Roof
60	½"×1½"	KT Bars	4'-0"	.
10	⅝"×2"	.	17'-3"	.
7	"	.	6'-8"	-
10	.	.	11'-6	.
10	1"×3"	.	21'-8"	-
4	1⅛"×2¼"	.	20'-9	.



NEW BUILDING, KODAK WORKS, WEALDSTONE: DETAILS.

THE PRUDENTIAL BUILDINGS, ABERDEEN.

(*See illustration on page 438.*)

It is a matter of common knowledge that the Prudential Assurance Company have a large and rapidly increasing clientele throughout the North of Scotland. To meet the increasing demands of their business, they have secured a site in Crown Street, Aberdeen, opposite the new General Post Office, erected three years ago.

Messrs. Sutherland and George, a well-known firm of architects, practising in Crown Street, a few doors away, have been appointed by the company to assist Mr. Waterhouse, of London, by acting as local superintendents of the work. The new offices will be within three minutes' walk of Union Street, and right in the heart of the Granite City. Hitherto a residential thoroughfare, the advent of the Post Office and now the Prudential Offices, and a new Masonic Temple is rapidly changing the appearance in a startling manner.

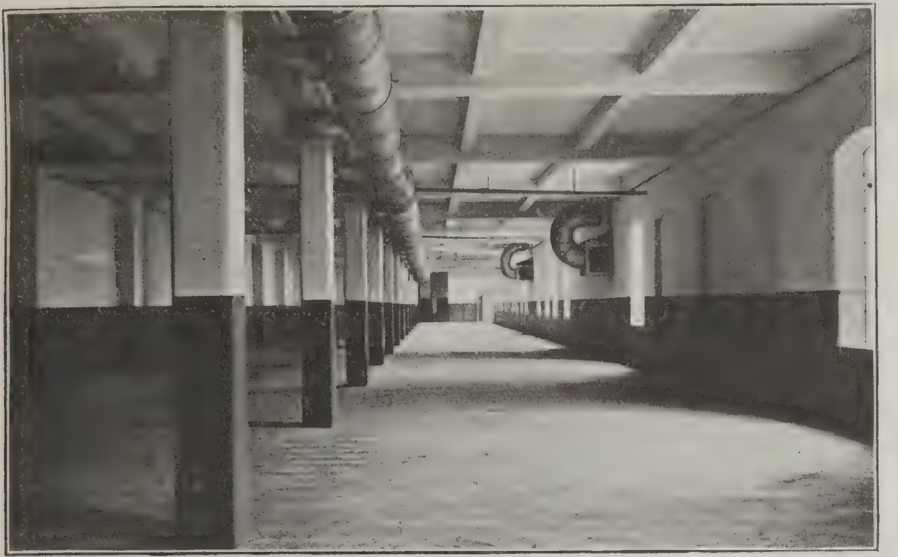
In the proposed new buildings, Mr. Paul Waterhouse, F.R.I.B.A., London, the architect, has realised not only the desirability of using granite in the Granite City—an intention in which the company entirely concur—but also the equally important necessity of treating granite as granite. It is for this reason that he has composed the design in simple lines, and has endeavoured to get the effect of dignity rather by proportion and mass than by intricacy and rich detail. Though a fine one, the site was not without its difficulties for the designer, foremost among which was its obliquity. It is to avoid the inconvenience of this obliquity, and also to obviate the incongruity sometimes produced by a high building rising abruptly among lower houses, that the designer has placed a wing of moderate height at each end of the composition. By this means he has got rid of the unsightly effect which would have resulted from a conspicuously acute angle at the north-west of the building, and has, moreover, reached the height desired in his central block without too sharp a contrast with the surrounding architecture.

A central archway leads both to the entrance of the company's own offices, and also to the staircase which give access to the upper floors. These upper floors are intended to be let as offices. The peculiar fall of the ground and the possession of a second frontage in Windmill Lane have made it possible to arrange an upper and a lower ground floor at the back of the building, containing sets of exceptionally well-lighted offices, so disposed as to be let either in large groups or small.

Another door leads to a large office, with windows on the front, so designed as to be suitable for occupation either by a branch bank or by a professional or business tenant of the class to whom a ground floor approach is of value. This tenancy would have self-contained basement accommodation, serviceable for strong rooms and similar purposes. In another part of the basement are placed smaller strong rooms for the use of the tenants occupying the upper floors. There will be eleven or twelve rooms on each of the principal floors.

The staircase will be warmed and well-lighted, and the hall or corridor by which the staircase is approached from the central archway will be faced by a large window, intended to give a cheerful character to the entrance.

The offices to be used by the company will be finished in a manner similar to that employed in their other more recent buildings. Screens, doors, counters, and furniture are to be made in mahogany and other hard woods—the walls receive a simple treatment, partly in semi-glazed faience and partly in coloured plaster, and the pavement will be mosaic. An effective and serviceable decoration is aimed at without undue elaboration.



NEW BUILDING, KODAK WORKS, WEALDSTONE. GENERAL VIEW OF THE INTERIOR.

OPENING OF BLACKFRIARS SUBWAYS.

The public subways at the north end of Blackfriars Bridge, which have been constructed at a cost of £30,000 to relieve the congestion of passenger traffic, were opened on Monday week by the Lord Mayor (Sir John Stuart Knill), who was accompanied by the Lady Mayoress and their daughter, and by Mr. Sheriff Roll and Mr. Sheriff Slazenger. There were also present Sir Melvill Beachcroft (chairman of the London County Council), Canon Horsley (Mayor of Southwark), the Rev. F. H. Hillersdon (Mayor of Westminster), the Rev. P. Clementi-Smith, and the Chairman (Mr. John Stopher) and members of the Streets Committee of the City Corporation. The Lord Mayor, on his arrival, was received by Mr. Stopher and conducted to a dais in the pavilion erected over one of the entrances to the subways, where he was welcomed on behalf of the Streets Committee. Mr. Stopher pointed out that the subways had originated in the widening of Blackfriars Bridge, and the scheme was due almost entirely to the efforts of one of his colleagues, Mr. Deputy Morton, M.P. When the Corporation promoted their Bill in Parliament for the purpose of widening the bridge, it was realised that in consequence of the width of the roadways, and the enormously increased number of people who would cross the bridge, the subways were of the highest importance. The London County Council also recognised that as they desired to bring their tramways across the river it was essential to relieve the congestion of the streets. They agreed to contribute out of the general rates of London a sum of £30,000 towards the cost of construction. The work began on December 18th last year, and the subways, now completed, had a total length of 480 yards, and were 10ft. wide and 8ft. high. The task had been carried out without any loss of life or injury to any person engaged on the works. The difficulties were complex and considerable. They involved the diversion of the pipe subway of the London County Council, and the removal of the electric light, gas, water, and other mains, and the re-arrangement of 140 telephone and telegraph cables containing 4,000 miles of wire The cost of construction alone had been £10,000, and the balance of £20,000 had been swallowed up in the sums paid to the General Post Office for the removal and readjustment of its apparatus.

Messrs. Perry and Co., the contractors, then delivered up the gold key of the subways to Mr. Basil Mott, the engineer, who in turn handed it to the Chairman and thence to the Lord Mayor. After unlocking the gates, the Lord Mayor made an inspection of the subways. Responding to a vote of thanks, Sir John Knill said that in his opinion the subways were a necessity at that particular point—a dangerous crossing which had become more so lately on account of the enormous motor traffic. He felt sure that the subway would be the means of saving many lives, and would be received with gratitude by the public.

The gold key with which the Lord Mayor opened the new subways is the work of Messrs. Garrard's, the Crown jewellers, of the Haymarket. It is richly chased and pierced, and bears the City Arms and supporters enamelled in colours, while on the reverse is engraved a suitable inscription.

The subway at Brackfriars Bridge, a writer in the "Morning Post" observes, may be regarded as an experiment in order to see how far an underground passage will save the time of the citizens, and safeguard them from the dangers incidental to the congested traffic. In the evidence given before the Royal Commission on London Traffic in 1903 it was stated that about 18,000 vehicles passed over Blackfriars Bridge in the twelve hours from 8 a.m. till 8 p.m., and about 22,500 crossed over the north end at the Thames Embankment. The traffic has considerably increased since then, and now that the bridge has been widened, pedestrians have not only to cross a larger space, but also to avoid the tramcars sweeping round from the bridge on to the Embankment. If a subway fulfils its purpose, it will largely solve the difficulty. Its main section is in the direct line of traffic, and runs from the point at which the bridge and the Embankment meet across to the junction of New Bridge Street and Queen Victoria Street. Half-way along it is cut by a smaller subway communicating on the east with Blackfriars Station and on the west with the Royal Hotel.

The subway at the bottom of Parliament Street, while affording communication between Bridge Street and Great George Street, was built primarily as a means of access to the public lavatories; the whole work cost about £6,000. The subways under the open space in front of the Mansion House are involved in the approaches to the Bank Station of the Central London Railway. Their total length is about 300 yards, and together with the booking hall, they were constructed at a cost of nearly £100,000, as the result of an arrangement between the railway company and the City Corporation. They are maintained by the company, and policed by the City, which has the right to close all entrances on special occasions, except those in front of the Royal Exchange. But it is still a moot point whether the subway has fulfilled its expectations, for of the 60,000 people who use it every day, 40,000 are passengers to or from the railway. One cause of the public's lack of appreciation, it has been suggested, is that the passages are complex, indirect, and bewildering, so that a pedestrian finds it impossible to go in a "bee-line" from (say) Walbrook to Threadneedle Street, or from Prince's Street to Lombard Street, and has to describe at least half a circle underground. It cannot be denied, however, that London, with its narrow streets and enormous traffic, has need of every help that subways can give to relieve the congestion, and to enable people to avoid dangers from motor vehicles. At Trafalgar Square, at Oxford Circus, Holborn Circus, Piccadilly Circus and at the point where Kingsway and Aldwych join a subway would be of immense service in enabling pedestrians to avoid the enormous traffic that sweeps rapidly over those areas. Time also would be saved, for it was proved by evidence given before the Traffic Commission that out of the twelve hours between eight in the morning and eight in the evening, not less than 5h. 5min. was lost by the traffic being blocked in Threadneedle Street, 5h. 1min. in Cornhill, 6h. 5min. in Prince's Street, 3h. 32min. in Wellington Street, and 4h. 6min. in the Strand. In St. James's Street, during the busy time, traffic is arrested for three-quarters of every hour. The holding-up of vehicles means the holding-up of pedestrians, but with the establishment of subways at busy centres, it might be possible for them to go their way undisturbed.

Notes and News.

At a recent meeting of the Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels, it was stated that the Society had helped more than half the total number of parishes in England and Wales with building grants amounting to £1,068,110.

* * *

The postponed Conference on town planning procedure will be held on Tuesday and Wednesday, December 14 and 15, at the Westminster Palace Hotel. The National Housing and Town Planning Council, under the auspices of which the Conference is to be held, propose to place before it as the basis for discussion a series of suggestions as to the most practical lines of town planning procedure adapted to: (a) great centres of population; (b) urban districts. The following gentlemen have been asked to co-operate in the preparation of this series of suggestions: Professor S. D. Adshead, Professor of Town Planning, Liverpool University; Mr. John H. Barlow, Bournville Village Trust; Professor Berlepsch-Valendas, Munich; Mr. Albert E. Cave, London; Professor Eberstadt, Berlin; Professor Fuchs, Tübingen; Professor Patrick Geddes, Edinburgh; Ober-Baurat Geusen, Dusseldorf; Mr. E. M. Gibbs, F.R.I.B.A., Sheffield; Mr. T. C. Horsfall, Manchester; Mr. Percy B. Houfton, architect, Woodlands Colliery Village; Mr. T. H. Mawson, Windermere; Beigeordneter Rehorst, Cologne; Monsieur Augustin Rey, Paris; Mr. B. Seebohm Rowntree, Earswick Village Trust; Mr. Raymond Unwin, Hampstead Garden Suburb; Oberbür germeister Wagner, Ulm; and Mr. Percy Scott Worthington, F.R.I.B.A., Manchester. The suggestions will take the form of a skeleton plan setting forth the best course for a local authority to take in the administration of the new Act. They will be printed and placed before the representatives at the meeting. Before the close of the Conference, arrangements will be made for the formation of a Town Planning Advisory Committee, in accordance with the resolution of the Congress held in August last. The gentlemen named above are being asked to act as members of this Advisory Committee and to give it the benefit of their skilled advice.

It is announced that the Commissioners of Works will introduce a Bill into the next Session of Parliament authorising them to acquire by compulsory purchase, or otherwise, land and buildings adjacent to the west side of the National Gallery. The site is in the occupation of the Earl of Lonsdale. It is bounded on the north by St. Martin's Street, the barracks, and the Horse and Dolphin publichouse.

* * *

The Metropolitan Electric Supply Co., of 16, Stratford Place, W., have opened new showrooms at 15, Porchester Road, Bayswater, for demonstrating to the general public the use of electricity in their homes, not only for lighting but for cooking, ironing, floor cleaning, etc. The decorative scheme has been carried out under the direction of Mr. A. W. Neal (the inventor of the decorative material known as "Coatostone," various tints of which are here put to effective use), of 77, Mortimer Street, W.; the electric lighting by the company's expert.

* * *

The operation of depositing cement under water to form concrete foundations and similar work is always interesting, and this character of work is being done at the present time on a large scale in the construction of the Detroit River tunnel of the Michigan Central Railroad. In depositing the material "tremies" are made use of, operated from a barge carrying the concrete mixing plant. These are riveted steel tubes, slightly longer than the deepest part of the river, and discharge the concrete directly into the forms.

* * *

To exclude water while the first batch is being laid, two or three empty cement bags are stuffed into the top of the tube and the wet concrete is poured in, forcing the bags down and the water ahead of them, and by continually maintaining the tube full of concrete no river water can enter. After the concrete begins to emerge from the lower end, the tube is kept several inches under the surface of the mass, forming a seal. As the concrete builds up in the forms the tremie tubes are raised in the towers supporting them on the barge. A floater rises with the concrete and indicates through a wire to the operator on the scow when the tremie should be raised. The wet concrete distributes itself from the bottom of the tremie tube in a circle about 10 feet in diameter.

* * *

The Metropolitan Water Board, at its monthly meeting, had before it a proposal put forward by the General Purposes Committee for the acquisition of a site in Kingsway for the erection of central offices. At present the Board's headquarters are at Savoy Court, and the premises are not large enough to house the whole of the staff which should, under a proper system of organisation, be concentrated at the head office. There is no accommodation for the meetings of the Board, which are held at the offices of the Metropolitan Asylums Board by permission of that body. The recommendation was that £100,000 should be offered to the London County Council for the freehold of 24,930 square feet of land fronting Kingsway, Sardinia Street and Lincoln's Inn Fields. It appeared from the report of the Committee that the net rent of the present offices in Savoy Court is £4,210 per annum, and that if the Board provided new offices, it would be possible to close altogether the New River Office, and that at Southwark Bridge Road, and further economies might follow. It had been suggested that the Board's land in Rosebery Avenue should be utilised, but the Committee did not thing it sufficiently central. A scheme was also contemplated which would include the closing of the Board's works at that place, and the Committee was advised that better value could be obtained by the sale of the Board's land there if the most valuable portion were not retained for the Board's own purposes. With regard to the proposed site in Kingsway, it was calculated that the scheme would result in immediate economy and an ultimate revenue from the letting of offices of £3,350 per annum, and that the Board would be able to effect large improvements in organisation. After a long discussion, the recommendation was by 22 votes to 15 referred back to the committee with instructions to bring up a report as to the utilisation of the Rosebery Avenue site, or other sites. In the course of the debate Sir Melvill Beachcroft drew attention to the fact that the London County Council would in the near future be vacating the County Hall at Spring Gardens, and the Education Offices on the Embankment, either of which might be available.

THE NEW GENERAL POST OFFICE BUILDINGS.*

By Thomas A. Watson, Assoc.M.Inst.C.E.

The New General Post Office Buildings consist of two blocks, viz., the public office block, 210ft. long by 54ft. wide by 80ft. high, with four floors above the ground floor and two below; and the sorting office block, 312ft. long by 212ft. wide by 75ft. high, with three floors above the ground floor and two below. Between the two blocks is a loading yard, 200ft. long by 60ft. wide, under which the basement and lower ground floors extend.

Both blocks are constructed on the skeleton type, in which all superimposed loads, including external walls, whether of ferro-concrete or stone, are carried at the various floor levels on girders supported on columns. The external walls are constructed in brick and stone, and at the ground floor level vary from about 5ft. thick to 2ft. 6ins. Many are constructed in reinforced concrete, and average only 7ins. thick.

Notwithstanding the great difference in the above thicknesses of wall in favour of the employment of reinforced concrete, it is probable the latter will soon become obsolete, as should the London County Council in the regulations dealing with reinforced concrete structures, and presumably now in course of preparation, extend the same facilities to reinforced concrete skeleton buildings, as given in the New General Powers Act to steel structures (and there is no logical reason why they should not), it will be possible to build external 9-in. and 14-in. walls as panels between columns, and these are much more economical than reinforced concrete walls 7ins. thick. At present, however, the progress of reinforced concrete construction has been seriously handicapped by the passing of the Act previously referred to.

Wall Construction.

The basement of lowest floor of the building is 27ft. below the ground, and is surrounded by a retaining wall of that height, which, however, is not a retaining wall pure and simple, but a vertical floor. The earth pressure is first transmitted to the 8-in. to 7-in. panels between vertical counterforts; these panels being reinforced with 7-16in. diameter horizontal rods, at 4 to 10ins. centres on the inside of wall, and 5-16-in. diameter rods at 8 to 24ins. centres on the outside. Outside these horizontal rods are vertical 5-16-in. diameter rods at 8ins. centres, round which stirrups are placed about every foot in height of the panels. The vertical panel therefore forms a horizontal beam transferring the earth pressure to the vertical counterforts, spaced at average centres of 5ft. 6ins., these in turn transferring the load to horizontal beams. In addition to being a horizontal beam, A is also the slab under the retaining wall, and is constructed as such with links, though its main object is to take the thrust from the counterforts to the bases of the columns next the retaining wall, or to a horizontal beam joining these bases, by means of struts.

The counterforts, 7ins. wide by 14ins. deep, exclusive of thickness of panel, are constructed as vertical beams, with two straight and two bent bars, all 1in. in diameter, stirruped at 5, 6, 7, 8, 9, 10, and 11ins. centres vertically, to take up the shearing stresses.

A beam, 8ins. wide by 16ins. deep, is reinforced with two straight and two bent 1⅛-in. diameter bars, with stirrups, as on the counterforts. In a similar beam the diameter of the bars is less, as the stresses are naturally less. The intermediate beams transfer the earth pressure to the columns next the retaining wall by means of struts, either arched or straight, according to requirements, and this earth pressure may be considered as passing from column to column through the main arched beams to the retaining wall at the other side of the building. The thickness at the base of a brick retaining wall to replace the one built would have to be 10ft.

The external walls of the building above ground floor level where built in reinforced concrete are split up into vertical panels by columns, generally at 35ft. centres. The vertical panels are again split up horizontally at every floor level by beams, which carry them and a small portion of the floor about 6ft. wide. These beams were constructed differently from the usual type of floor beam; their depth was from 18ins. below the floor level to the level of the sill of the window above, a depth which varied at the different floors. They were reinforced with two straight 1½-in. to 2-in. diameter bars at the bottom, and two at the top, connected by means of 7-16-in. to 9-16-in. diameter vertical bars, two to every six inches bent round the horizontal bars at bottom and at top, in the form of a double shepherd's crook (a name by which they were known on the works).

Horizontal 5-16-in. diameter bars were placed at vertical distances of 6ins., parallel to the larger rods, to reinforce the concrete against temperature stresses. Window cleaning galleries were cantilevered out from these beams. The panels between the beams and windows were reinforced with vertical and horizontal 7-16-in. and 5-16-in. diameter rods, at approximate centres of 6ins., the ends of vertical ones passing well into the beams above and below them.

From the preceding description it will be noticed that a wall is more a beam than a wall; in fact, seeing that the same construction is followed between every floor, the external wall might well be regarded as one continuous girder from end to end of the building, with the windows to form open webs.

Floor Construction.

The ground floors were designed to carry 1cwt. per square foot superload, and the first, second, third, and fourth, ¾cwt. in addition to their own weight.

Stanchions were placed as far apart as possible compatible with economy, to give large unobstructed areas, and generally speaking, were 35ft. centres one way, and 34ft. centres the other, though in the centre bay, running east and west, the 35ft. was increased to 45ft., and running north and south the 34ft. was increased to 40ft.

The main arched beams, 35ft. span centre to centre of columns, are 2ft. 6½ins. deep in the centre, 5ft. 3½ins. at the haunches, and 10ins. wide, these depths including the 3½ins. thickness of floor. The reinforcement of these beams consists of two 1⅝-in. diameter bars at top and four 1¾-in. diameter bars at the bottom at the centre of the span. The two lowest 1¾-in. diameter bars follow the curve of the beam to the haunches, then pass horizontally through the columns, and follow the curve of the adjacent beam, projecting into the latter a distance of 2ft.

The two upper bottom bars are horizontal for one-third of the span, and then bend up at a slope of about 15 degs. to the horizontal, till they come to within about 3ins. of the floor level, and are then horizontal for the remainder of their length, passing through the column into the adjacent beam about 2ft., as also do the two top bars, which are straight throughout.

In the haunches a series of horizontal 9-16-in. diameter bars are placed, lapped where passing through the columns some 2ft.

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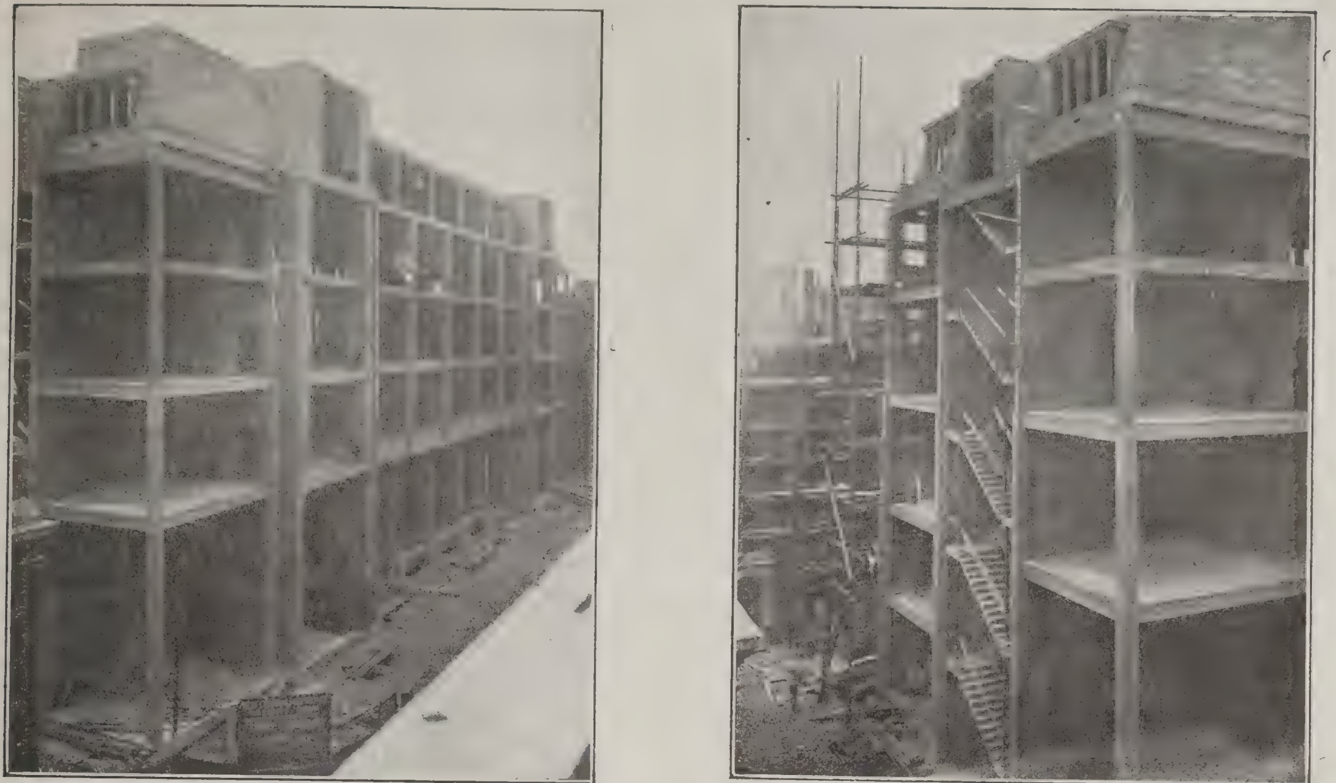
*Paper read before the Junior Institution of Engineers.



THE NEW GENERAL POST OFFICE BUILDING, LONDON.

General View of Structural Work from the Front. End Elevation of Public Office Building.

the outer ends bent round as a shepherd's crook and anchored to a ⅞-in. diameter bar embedded across the beam below the main reinforcing bars.

From the ⅞-in. diameter cross bars just mentioned, other shepherd crooks run to the top of the beam, acting as stirrups, and helping effectually to fix the ends of the main beams. Stirrups out of 1½-in. by ⅛-in. hoop steel are also placed round the main bottom bars at right angles to them, extending to the top of the beam, and spaced 8ins. apart at the haunches to 18ins. apart in the centre of the span. Top stirrups hung from top 1⅝-in. diameter bars are also used, and similarly spaced to the lower ones.

These arched beams receive their load from secondary girders, 8ins. wide, 16ins. deep, below floor, or 19½ins. deep overall, at 5ft. 10ins. centres, reinforced with two straight and two curved 1⅛-in. diameter bars, with stirrups out of 1¼in. by ⅛in. hoop steel, at 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, and 16-in. centres, starting from supports to the centre of the beam.

The floors of 5ft. 10ins. span centres are reinforced with 5-16-in. diameter straight and bent bars alternately, at 10-in. centres, continuous over three secondary beams, and overlapping contiguous bars by 12ins. All the straight bars have stirrups out of ⅞-in. by 19-in. B.W.G. hoop steel, at 5ins. and 13ins. from each support, four in each bay. Near the top surface of flooring slab straight 5-16-in. diameter rods are laid at right angles to the reinforcing rods, at 12-in. centres.

This method of construction for the floors, with modifications such as extra straight bars in top flanges of secondary beams, and inverted stirrups, etc., was followed throughout the whole main building, both for floors and roof. The main beams in roof were, however, not arched, but had flat soffit.

The Columns.

The columns carrying the main beams of the typical bay taken, are 28ins. square in the basement, with six 2¼-in. diameter bars and six 2-in. diameter bars, all linked together with 17 links out of 3-16-in. diameter wire every 4ins. in their height. They are 24ins. square from lower ground to ground floor, reinforced with twelve 2-in. diameter bars, with links as above every 5ins. in the height; 20ins. square from ground to first floor, a height of 20ft. 6ins., with twelve 1⅞-in. diameter bars, linked as above; from first to second floor they are 18ins. square, with ten 1⅞-in. diameter bars, with twelve links every 5ins. in their height; from second to third floor, 16ins. square, with eight 1⅝-in. diameter bars, and ten links every 5ins. in their height; from third floor to the roof they are 14ins. square, with four 1⅜-in. diameter bars and four links every 5ins.

Where upper bars stood on lower bars, steam barrel socket pieces, 6ins. long, were provided as sleeves.

These columns were carried on a slab 13ft. 6ins. square, 3ft. 6ins. deep, reinforced with a lower layer of nineteen ⅞-in. diameter bars at 8ins. centres, 1½ins. from the bottom of the slab, and nineteen ⅞-in. diameter at 8ins. centres, immediately above the preceding, and at right angles to them, with twenty-eight stirrups out of 1¼-in. by 1-16-in. hoop steel, 1ft. 9ins. high and 104 1ft. 3ins. high, distributed amongst the nineteen bottom bars. Similar layers of ½-in. and ⅜-in. diameter rods were placed at 10ins., 24ins., and 32ins. above the preceding layers.

The above description is typical of by far the larger proportion of columns and slabs and floor, but of course many special cases were met with, to describe which would occupy more time than is allowed the author. A few special features, however, deserve mention.

Floors, etc., on Cantilevers.

To preserve an unbroken space at the end of the sorting office block, next to the loading yards, so that the loading and unloading of vans might not be impeded by the presence of columns, it was necessary to carry the external wall 52ft. in height and 12ft. 6ins. width of three floors and roof at that end, on cantilevers.

The main arched beams of the building run parallel to this wall, so that the secondary beams were made to cantilever over the first line of arched beams, a distance of 12ft. 6ins., and were tailed down to the second line of arched beams, 21ft. 6ins. back from the first line.

These cantilevers were spaced at 5ft. 10ins. centres, were 11ins. wide by 22ins. deep below floor, and were reinforced with four 1⅞in. diameter bars at top and four 1⅝in. diameter bars in bottom. The two topmost bars extended the whole length of the beam, and their inner ends were bent round the top bars in second line of arched beams referred to above, and thus anchored. Their outer ends passed under the top bars in the fascia beam under the wall. The other two top bars extended from the outer end of cantilever to a point approximately half-way between the first and second line of arched beams, the portion inside the first line of arched beams being bent down till the inner end was slightly below the centre line of the beam.

The four bottom bars extended from the beam under the external wall to the second line of arched beams, and their inner ends were bent round at right angles vertically upwards a length of about 12ins. to form an anchorage or tie in the arched beam. The outer ends were linked to upper bars by means of two ½in. diameter double shepherd's crooks. Stirrups of course were provided of exceptional strength, and were spaced more closely in order to take up the enormous shearing stresses occurring on these beams. The fascia beam joining the ends of cantilevers, and carrying the wall over, was 12ins. wide by 24ins. deep under the floor, and was reinforced with two 1⅛in. diameter rods in the bottom and two 1⅛in. diameter rods in the top, both the top and bottom rods resting on the top and bottom steel bars in the cantilevers.

An Interesting Footbridge.

Another interesting feature is the footbridge connecting the public office block to the sorting office block, at the second floor level, with a span of 50ft. 6ins. in clear. This bridge is of course supported at the sorting office end on the cantilevered secondary beams, bearing on two of these in the second floor and suspended from two in the third floor; all these four secondary beams being suitably strengthened to carry the additional load.

The footbridge is 6ft. 6ins. in width inside, with walls 5ins. thick, and 9ft. 6ins. from the floor level to the underside of roof over. The walls each have thirteen windows in them, and the same principle is followed in their construction as in the external walls of the buildings; that part of wall below sill level of windows being a beam 5ins. wide, reinforced with two 1⅞in. diameter rods at bottom and two at the top, linked together with double shepherd's crooks, $\frac{7}{16}$ in. and ½in. diameter every 6ins. in length.

These beams at the public office end rest directly on the wall, which at this part is constructed 12ins. thick. The lower bars pass through the wall and extend into a bracket below the second floor, about 2ft., being thus amply anchored, whilst the upper bars have their ends bent round at right angles for a length of 2ft., the ends being on the inner side of the inner horizontal bars in the wall of the public office block. When the centering was struck from under this bridge the sag was imperceptible, and when tested with 50 per cent overload over the whole area the deflection did not exceed 1-12,000th of the span.

Chimney of Special Construction.

The chimney may be mentioned as another feature where special construction was necessitated, being exceedingly heavily reinforced. Its height is 130ft.; the internal dimensions at the bottom are 5ft. 2ins. by 4ft. 8ins., at top 4ft. by 3ft. 6ins.; the opening in one side for flue is 7ft. 7½ins. high, the whole width of flue.

The wall at bottom is 8in. thick for a height of 50ft., at which point the internal dimensions of the shaft are reduced to 4ft. by 3ft. 6ins., and a special belt is formed to carry the upper length. The walls of the shaft are 9ins. thick at this point, gradually decreasing to 6ins. at the top. The 8in. walls at the bottom are reinforced with twelve 1⅜in. diameter vertical bars, six on each side of the flue opening, and with forty-six 1in. diameter vertical bars (twenty-two internal and twenty-four external ones). Above the flue opening the 1⅜in. diameter bars were dispensed with, but the number of external bars was increased to forty-six of 1in. diameter and internal bars to forty-two $\frac{15}{16}$ in. diameter. These were carried up to a height of about 50ft., where the altered size of shaft occurred and the number of external bars became thirty-eight of $\frac{15}{16}$ in. diameter and internal thirty $\frac{15}{16}$ in. diameter. These extended for 24ft., when the external bars were decreased in diameter to ⅞in., and the internal to ¾in. This number of external bars was maintained to the top of the chimney, but the diameter of the bars was gradually decreased to ¾in.

The internal bars were omitted altogether in the top 20ft. of shaft, and halved in number for the 20ft. below that. Stirrups were placed on every third pair of internal and external bars, at vertical intervals of about 12ins. all the way up the chimney. Immediately inside both the internal and external bars horizontal bars at 8in. centres of $\frac{7}{16}$ in. diameter, were placed bent round at right angles at the corners and overlapping each other about 9ins.

The interior of the chimney was lined for the first 50ft. in height with fire brick, and foot-irons were provided and embedded in the concrete as the work proceeded.

Tunnels.

Two tunnels under King Edward Street, connecting the basement of the new building to that of the building on the opposite side of the road, were constructed. The larger tunnel is 7ft. 6ins. wide by 8ft. high, with segmental top; the smaller, 5ft. wide and 6ft. 6ins. high; both are about 60ft. long. The construction of both tunnels was alike, and consisted in the larger one of a bottom, walls and roof, all 9ins. thick.

The bottom was constructed as an inverted floor, with alternate straight and curved bars every 6ins., ¾in. in diameter, the ends of same being bent round square and up into walls 12ins.

The walls were reinforced with ¾in. diameter internal bars every 6ins., and ½in. diameter external bars every 6ins, in pairs; ⅜in. diameter horizontal bars were placed outside both the external and internal bars, and touching them every 8ins. in height; the internal vertical bars being stirruped at intervals of about a foot.

The segmental top was reinforced with cross-bars bent to the shape of segment in lower and top surface. The upper ones $\frac{11}{16}$ in. diameter, every 12ins., the lower $\frac{13}{16}$ in. diameter also every 12ins., the latter being stirruped; ⅜in. longitudinal bars were also added, resting on lower and upper bars at 8in. centres.

Staircases.

The staircases are all very similar in construction, but the most noticeable is the south one (in the public office block), which will now be briefly described.

The main flight of stairs consists of 13 steps with a landing at the bottom 4ft. 7½ins. long, and at top 4ft. 4½ins. long. This flight, including the landings, is constructed as a slab, 4ins. thick, 4ft. 6ins. wide, with two bends in it, of a span between walls of 19ft. 1½ins. on the horizontal. This slab, in addition to carrying itself, the steps, and superload on same, carries one end of each of the upper and lower flights of stairs, the strings of these latter being suspended to the steel reinforcement in the slab, and receiving additional support from cantilever bars embedded in walls. The reinforcement consists of nine ⅝in. diameter bars, five straight, and four curved, all bent to shape of stairs and landings. The straight bars have twelve stirrups each, passing up into the nose of every step. The curved bars have no stirrups, but are bent up so that they follow the top surface of landings, about ½in. below same. Both straight and curved bars have a 5in. bearing in walls; ⅜in. diameter horizontal bars are placed immediately above the straight bars at 12in. centres, merely as a tie to the concrete.

Difficulties in Construction.

In carrying out the work many difficulties were met with, not the least of which was the construction of the retaining walls, which, though only 8ins. thick in the thinnest part, required a trench 58ft. wide in places in order that it might be properly constructed.

This was due to the monolithic nature of reinforced concrete and to the fact that the main beams were continuous from side to side of the building. The width of the trench was therefore settled by the length of these bars to be at least 54ft. wide, and by increasing this to 58ft., it was possible to finish the bases to the second row of columns parallel to the retaining wall, and consequently this width was adopted, so that when the retaining wall was finished the first and second rows of columns were concreted up to the ground floor level. The bay of flooring between these two rows of columns

THE NEW GENERAL POST OFFICE BUILDING, LONDON. GENERAL VIEW FROM THE BACK.

at lower ground floor level was also concreted.

Special arrangements had to be made to house the bars of the main beam in the second bay in the columns in the second row after these columns had been constructed to ground floor level. A pocket 5ft. 6ins. deep, and half the width of column one way and 12ins. wide on face of column, was left, and the bars in main beam (2) were bent at right angles for a distance of 5ft., and this 5ft. passed vertically up the column inside the links, which latter were at these pockets made on the column bars themselves after the beam bars were fixed.

The timbering of the trench which extended round three sides of the site was done in the usual way, a row of piles being driven down the centre of trench and ground excavated in 3ft. layers, poling boards, walings and struts to piles being fixed every 3ft. in height. When the bottom of the trench was reached the bars for the slabs under the retaining wall and columns were first put in, and for the struts from this slab to column base and both slabs and struts and column base concreted, the centering for counterforts was fixed, back shuttering 3ft. high for retaining wall was fixed, the bars in counterforts stood up in place, and also the vertical bars in the thin panels of retaining wall, the top ends of which were all fastened to a horizontal batten to keep them from bending over and to maintain them at the right distance apart.

The wall was then concreted 3ft. high in 6in. or 7in. stages, according to the width of the centering boards used. The back shuttering was then removed, and the space between the back of the retaining wall and the earth filled with ordinary brick or ballast Portland cement concrete 8 to 1.

The next line of struts, walings and poling boards was then removed, the back shuttering inserted behind the reinforcing bars, and the process described above repeated.

The columns were carried up simultaneously, and as the struts above were removed, fresh struts from the newly concreted retaining walls to the piles were fixed, to take the earth pressure while the concrete was green. When the lower ground floor level was reached, the lower centering boards were removed and used in the upper half of the retaining wall. It may be stated here that all centering timber was 2ins. thick, the necessity for absolutely rigidity being a governing factor. The centering for the basement was all wrought to give the concrete a smooth face, to which a coat of limewash gave the finishing touch.

In constructing the centering for the floors, poles were used as props under the main and secondary beams, and as they had to be left practically till the topmost floors had been constructed, arrangements were devised and adopted in order to release the centering under the flooring slabs, and at the side of the beams without touching the beam bottoms.

For the walls, timber profiles of 4ins. by 3ins. scantling were first fixed, and shuttering for one side of wall placed in position up to the next floor level, and the centering on other side fixed as the wall was concreted. The 4 by 3 profiles were bolted together with ¾in. or ⅝in. diameter bolts, and distance pieces were placed between them at intervals as necessary.

For the ventilating ducts and cable ducts various methods of centering were tried, but the most efficacious were cores made of ¾in. timber in 6ft. lengths, which were collapsed and drawn up every 6ft. in height of wall or column, so that generally speaking, where these vertical ducts occurred the utmost height that could be concreted in a day was 6ft.

The flues for the chimneys were lined with 9in. diameter fireclay tubes, which were inserted as the walls in which the chimneys occurred were built.

Composition and Mixing of Concrete.

The concrete was specified to be, for all work below ground floor level:—1 yard of ¾ ballast, ½ yard sand, and 7cwt. cement; above the ground floor, 6cwts. of cement. The extra 1cwt. of cement for work below the ground floor was chiefly on account of the retaining walls, which with this extra 1 cwt. were made watertight, the necessity for a vertical damp course outside being thus avoided. All concrete was machine-mixed, batch mixers being employed. Thames ballast was used for the aggregate throughout the work, and a special screening and crushing plant was installed to separate the sand from the ballast and to break the larger stones down to the ¾in. size specified.

The steel had to conform to the British Standard specification, and was all bent, caulked, twisted, etc., on the site, about 3,000 tons being used in the work.

Testing the Work.

During the course of the work, test columns were constructed 9ins. square, 6ft. long, with four 1in. diameter rods. These were tested at Messrs. Kirkaldy's 105 days after being made. Curves were also plotted. The results are interesting, but much more might be done in this direction.

Examination of the specimens after destruction went to show that some of the bars being longer than others, the stress came on them unequally, the longer ones being bent much more than the shorter ones.

Of course this may have occurred after destruction had taken place, but in the author's opinion it would be well in future tests for the load to be applied to the concrete only and transmitted from the concrete to the steel bars, as is actually the case in buildings.

The buildings were designed by Sir Henry Tanner, I.S.O.; the ferro-concrete design has been worked out on the Hennebique system. Messrs. Holloway Bros. (London), Ltd., were the contractors.

Federation News.

BURTON-ON-TRENT ASSOCIATION.

Secretary: A. W. Chamberlain.

A general meeting of the Burton-on-Trent Association was held on November 23rd, Alderman Lowe, J.P., in the chair.

After considerable discussion of the resolution passed at the half-yearly meeting of the National Federation at Portsmouth, it was resolved that the secretary write to each member of this association on the subject of priced schedules, calling attention to Rule 10, section M, of the association's rules, which reads as follows: "That, without the consent of the Emergency Committee, on no consideration should priced schedules be sent in along with tenders by members of this assosiation, except under separate cover, the same to be returned unopened if not accepted."

It was resolved that this association collect from its members £20 during the year 1910, towards the National Reserve Fund.

After discussing the terms of the agreement with the N.A.O.P., representatives to serve on a joint committee with representatives of the plasterers were nominated, and the secretary was instructed to arrange the first meeting.

It was pointed out by the secretary in reference to Rule 2, qualification of members, that two of the master plasterers belonging to this association are still members of the N.A.O.P., and that in addition to being a trade society the N.A.O.P. is a friendly society, and it was resolved that the following be added to Rule 2: "Except in the case of master plasterers."

A discussion arose in respect to the recent advertisement in local papers for certain works required by the Education Committee to be done during the Christmas holidays, payment for which is not to be made until three months after completion. It was also mentioned that the Education Committee had recently given works to manufacturing firms away from Burton, and it was resolved that in both instances letters of protest should be sent to the chairman of the Education Committee.

It was resolved to hold the annual meeting and dinner on Saturday, January 29th, 1910, and to invite Colonel Barnsley, of Birmingham, who will be the President of the Midland Centre, to attend.

At a meeting of the Burton-on-Trent Buildin Trades Local Conciliation Board, held at the Station Hotel on Tuesday, November 23rd, Alderman Lowe, J.P., in the chair, the Board carefully read the recent additions made to the rules which were passed at the annual meeting of the National Board, held in London on May 25th, 1909.

The employers' secretary was instructed to furnish the operative secretary with a copy of the alteration and additions to the rules as proposed by several trade unions.

PORTSMOUTH ASSOCIATION.

Secretary: F. B. Roskell.

The quarterly general meeting of the Portsmouth Master Builders and Building Trades Association was held at the Sussex Hotel on November 16th (Mr. G. J. Davis, president, in the chair), when a large and representative gathering assembled.

At the commencement of the meeting, the members all standing, passed a vote of condolence with the family of the late Sir John Baker, M.P. for Portsmouth, and late hon. member of this association.

Correspondence was then read, which had been dealt with by the committee since the last general meeting.

With regard to the question of quantities being returned to the unsuccessful contractor, the secretary was instructed to write to the local authorities requesting that in future bills of quantities may be returned as soon as possible after the contract had been placed as in several instances they had been withheld for some months.

The members' attention was then drawn to the recent formation of a Speculative Builders' Society in this town, and after a lengthy discussion on this subject, it was unanimously agreed that the one association should be the best protection for the trade, and that good results could not be expected from a second organisation. The secretary was therefore directed to write to the Speculative Builders' Society asking them to appoint a deputation to meet the Master Builders' Association with a view to discussing the desirability of their joining up with this association and pointing out the mutual benefit which would ensue from amalgamation.

Organisation and means of improving the welfare of the association was then brought forward, when several useful suggestions were made and noted for the consideration of the committee.

It was also decided, with regard to the forthcoming Christmas holidays, that a circular should be sent to each of the members recommending that works be closed from the Friday night to the following Wednesday morning.

Mr. Salter then drew the attention of the members to the report of an important decision, which appeared in the issue for November 3rd of the "Builders' Journal," relating to the appeal, W. Kennedy, Ltd.; and Mayor and Corporation of Barrow-in-Furness turning on the question, "What is an Arbitration Clause?" which he considered was one of great interest to all builders. Continuing, he hoped all builders present would strongly support the "Builders' Journal," which was the official organ of the National Federation of Building Trade Employers.

The meeting then closed with a hearty vote of thanks to the president.

LEEDS ASSOCIATION.

Secretary: J. Davidson.

The annual meeting of the Leeds Association was held at the Grand Central Hotel, Leeds, on Tuesday, November 16th. Mr. W. Irwin occupied the chair, and was supported by several members.

The minutes of last annual meeting were read and approved. As the annual report and cash statement had been printed and circulated among the members, Mr. Irwin moved its adoption. In doing so, he referred to the agitation of the employees of the Corporation to obtain concessions as regards walking time, car fares, etc., beyond those recognised in the standard conditions. The Corporation had been reminded that the standard conditions were almost uniformly accepted in other parts of the country, and that many advantages accrue to local authorities from following this procedure.

The Highways Department of the Corporation, after hearing the view of representatives of the association, had reverted to the charges for highway repairs being based on measurement instead of time.

The adoption of the report and cash statement was seconded by Mr. P. Rhodes, and unanimously approved.

Mr. W. T. Ledgard, in proposing that Mr. Irwin be elected as president for the ensuing year, referred in appreciative terms to the valuable services which he had rendered during the past two years, and stated that it was the unanimous wish of the members that Mr. Irwin should accept office for another year. The motion was seconded by Mr. J. H. Tomlinson, and carried with acclamation. Mr. O. Mawson was re-elected vice-president.

On the motion of the President, seconded by Mr. Appleyard, a cordial vote of thanks was tendered to Messrs. E. Umpleby and G. W. Nettleton for their services as honorary auditors. Messrs. G. W. Nettleton and G. W. Wilson were appointed auditors for the coming year. The following gentlemen were appointed to represent the association on the Yorkshire Federation: Messrs. W. Irwin, O. Mawson, J. H. Tomlinson, G. W. Nettleton, F. Mountain, and S. Worsnop. The trade committees and Local Conciliation Board were also appointed.

The President reported that arrangements had been made with the Yorkshire Federation, and the secretary, for the Leeds Association to share in the tenancy and benefit of larger offices which had been taken in West Bar Chambers, Boar Lane, Leeds. The offices would afford ample accommodation for the ordinary meetings of the association, and would give it a definite and official habitation.

On the motion of Mr. P. J. Pickard, seconded by Mr. P. Rhodes, the action of the president and committee was confirmed, and the terms of the tenancy and arrangements for furnishing were referred to the president and Messrs. W. T. Ledgard and J. H. Tomlinson.

The sub-contract form submitted by the Yorkshire Federation was carefully considered, and, on the motion of Mr. F. Mountain, seconded by Mr. J. Dobson, the draft was generally approved.

At the conclusion of the business, the president entertained the members to tea.

PRESTON ASSOCIATION.

Secretary: John Tomlison.

The sixteenth annual dinner of the Preston Building Trades Employers' Association was held on November 10th, in the Boardroom at the association offices, Mount Street, Preston, when the president, Mr. R. H. Catterall, was in the chair, and was supported by Messrs. S. Salthouse and J. Croft, the vice-presidents, T. B. Barnett and W. Croasdale, ex-presidents, W. Cooke, junr., hon. treasurer, the assistant secretary, and about fifty members and friends.

After the usual loyal toasts, the President referred with regret to the absence of the members of one firm through a recent family bereavement, and asked for a vote of condolence and sympathy with Mr. John Cartmell in the loss of his wife. He also read a letter from Mr. John Tomlison, the secretary, apologising for non-attendance through illness, and stating that this was the first annual dinner he had missed for the last sixteen years.

Mr. T. B. Garnett proposed the toast of "The Lancashire, Cheshire, and North Wales Federation," and said he thought the Federation was doing very useful and necessary work in bringing the local associations into closer union, and thus improving their power for good. He personally had not had much practical experience of Federation work, but Mr. Cooke, who would respond to the toast, would be able to tell them more on that subject. He considered it a great honour to Preston that for the second time they had a Preston man president of the Federation, and he heartily congratulated Mr. Cooke on having attained that position.

Mr. Cooke, on rising to respond, met with a hearty reception; he thanked the members present for their kind appreciation, and said he also felt the honour of his position very much, and was glad he was a Preston man. Preston played a very important part in Federation work, perhaps more than many of their members imagined. It was looked up to by other local associations with very great respect, as being an example of first-class organisation second to none in the country. He then proceeded to give a very detailed account of the Federation and its works, its composition, membership, and the recent cases it had dealt with, concluding his remarks with an appreciative reference to the National Council and the Employers' Parliamentary Council, which observations were received with applause.

Mr. Walter Hoyle, in a short speech, proposed the toast of "The Preston Building Trades Employers' Association," and Mr. W. Croft (Messrs. T. Croft and Sons, Ltd.), in responding, said that theirs was an organisation they could not very well do without. The firm he represented had been members now for so many years, that, looking back to their first connection with it, seemed like ancient history. They had received many benefits from closer association with their fellow-employers, and he ventured to think that there were few if any members who did not feel with him that it would be a calamity indeed if ever anything should occur to break up their society. The old-time antagonistic feeling with regard to the operatives was passing away, and it was becoming a pleasure to meet them and discuss in a conciliatory manner all they had to urge for the betterment of their condition or the trade.

Mr. Shorrock, in proposing the toast of "The President and Officers," said they all knew the President and recognised that he had necessarily gone through a lot of hard work before he had attained the highest position in their society. He was a man of sterling worth, and strong opinions, which he did not fear to express. Mr. Shorrock also paid a high tribute to the other officers, the hon. treasurer and the secretary, whom he regretted not to see there that evening.

Mr. Catterall, in reply, thanked the members for their kind reception of the toast, but was of opinion that more thanks should be given to the Committee, as that body did the best and most important work—work that was very often difficult, and required a great deal of thought and tact to carry out successfully. Passing to other matters, he referred to what he considered the unsatisfactory condition of the trade at the present time, both locally and nationally. Were, he asked, members satisfied to conduct their business under present conditions and difficulties? He was of opinion they were not, and that something would have to be done very soon to try to improve matters.

Mr. S. Salthouse, the senior vice-president, and Mr. F. Starkie, the hon. solicitor, having also responded, a musical programme was then proceeded with, and a most enjoyable evening was spent in social intercourse.

NOTTINGHAM ASSOCIATION.

Secretary: W. J. Barton, F.C.I.S.

At the last annual meeting of the Nottingham Association, Mr. H. R. Thompson (of Messrs. F. M. Thompson and Sons, Ltd.) read a very interesting and instructive paper on the inter-trading rule, after which the Executive Committee were directed to give the subject their further consideration. In accordance with this wish, the Executive invited Mr. A. G. White (the National secretary) to come and give the members some further information on the advantages and working of the rule. Mr. White very kindly consented, and gave a most instructive and illuminating paper on the rule and the many advantages to be obtained, both locally and nationally, by widening the scope of associations. A resolution was passed at the meeting deciding to adopt the rule at an early date. The Executive Committee then took up the whole question of the association's rules, and after full consideration of the question, decided to recommend to the members that the title of the association should be altered, and that an entirely new set of rules should be adopted, and accordingly set to work to draft the same. The title suggested was "The Nottingham and District Association of Building Trades Employers." The model set of rules, as recommended by the Conference of secretaries, was taken as a basis for the new rules, and the proposals of the committee have just been submitted to a general meeting of the Association, each member having been supplied with a copy of the proposed rules with his notice of the meeting.

The meeting was well attended, and after some criticism on one or two points, and explanations given on other points, the whole of the rules as proposed by the committee were accepted and adopted, with one addition only.

It may be of interest to other associations to indicate the points on which the rules now, as adopted, differ from the model set.

Constitution.—We provide that associate and honorary members shall not be entitled to attend or vote at any business meeting of the association, except on the invitation of the administrative committee.

Election of members.—We provide that the proposer of any applicant who is not elected, shall have power of appeal to the next general meeting.

Management.—(a) We provide that the Council shall meet as required, instead of fixing definite times for meetings. (b) Cheques may be signed by the President, or a Vice-president and the Treasurer.

Funds.—(a) Ordinary members may have the option of having the amount of their subscription assessed at 8 guineas per annum in lieu of making a wage return. (b) The minimum annual subscription for ordinary members shall be 15s.

After this clause we have inserted the following note:—The official journal of the Federation will be supplied by the Association, each week free of cost, to all ordinary members whose subscription is paid for the current year.

The secretary fully appreciates the benefit he has received from attending the Conferences of Secretaries, and the assistance given him by various secretaries, and will be pleased to reciprocate by forwarding a copy of the rules as soon as received from the Press, or by giving any information to associations who may be contemplating a change in their rules.

BRADFORD ASSOCIATION.

Secretary: J. Davidson.

A general meeting of the Bradford Association was held at the Builders' Exchange, Bradford, on Tuesday, November 23rd. Mr. T. E. Taylor occupied the chair, and was supported by several members.

The clauses of the Bradford Corporation Bill were read and discussed, and it was resolved to defer consideration until the next meeting.

The proceedings of the Yorkshire Federation were read, and special attention was drawn to several matters of interest.

The question of officers and committees for the ensuing year was considered, and several nominations were made.

It was arranged to hold the annual meeting on Tuesday, December 21st.

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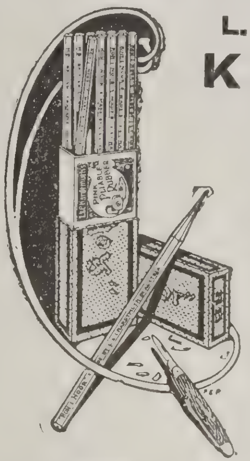

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Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Caerleon (Mon.).—For erection of playsheds at Williams's Endowed Schools, for the Governors. Mr. H. J. Griggs, architect, Metropolitan Bank Chambers, Newport.

T. Jenkins	£550	0	0
Williams and Son	506	0	0
E. D. W. Evans	402	14	10
R. H. Parkyn	381	0	0
Phillips, Clark, and Co.	375	0	0
E. Richards	368	11	0
P. H. Saunders	350	5	0
J. Charles	347	0	0
J. H. Williams	344	0	0
E. C. Jordan and Son	340	0	0
G. Prosser	336	0	0
J. B. Jenkyn	334	0	0
F. C. Parfitt	330	0	0
G. F. Leadbeter	328	0	0
C. H. Reed	310	0	0
E. Dean,* Newport	271	10	0

* Accepted.

Evesham.—For the construction of a reinforced concrete roof, supported on columns etc., of the same material, for their new open service water reservoir (capacity 2,000,000 gallons), for the Town Council Mr. H. S. Harvey, borough surveyor:—

Potter and Co., Ltd., London	£3,530	0	0
Lambrick and Co., Burton-on-Trent	2,512	0	0
Hodkin and Jones, Ltd., Sheffield	2,450	0	0
J. Ellis and Sons, Leicester	2,213	8	6
Trussed Concrete Steel Co., Westminster	2,200	0	0
W. Cowlin and Sons, Bristol	2,098	0	0
W. Moss and Sons, Loughborough	2,050	0	0
British Fire Proof Construction Co., London	2,039	0	0
Hibbert and Co., Manchester	1,982	0	0
Stuarts Granolithic, London	1,923	0	0
H. V. Smith and Co., Westminster	1 913	0	0
F. Brazendale	1,823	0	0
Empire Stone, Co., Thanet House, Strand, W.C.	1,808	0	0
Hoborough and Co., Gloucester, Hennebique (accepted)	1,803	0	0
Columbian Fire Proofing Co., 37, King William Street, E.C.	1,682	0	0
T. Vale and Sons, Stourport	1,680	0	0
Leslie and Co., Ltd., Kensington Square, London	1,341	0	0

Leamington.—For alterations and renovations at 26, Clemens Street, Leamington. Branch premises for Banbury Co-operative Society. Frederick J. Cooke, architect, 33, Bridge Street, Banbury.

Messrs. Bailey and Co.	£165	0	0
Messrs. Smith and Sons	161	10	0
Thomas and Son*	130	0	0

*Accepted.

Llandrygarn (Anglesey).—For alterations and repairs to Council school. Mr. J. Owen, architect, Menai Bridge and Holyhead.

O. Jones	£965	0	0
J. and J. W. Owen, Llanlilwn	895	7	0
R. J. Jones	878	0	0
R. Thomas	850	0	0

London, S.E.—For carrying out alterations at the police-station at Kennington Lane, S.E. Mr. J. Dixon Butler, F.R.I.B.A., surveyor, New Scotland Yard, S.W., Quantities by Messrs. Thurgood, Son, Son, and Chidgey, 8, Adelphi Terrace, Strand, W.C.

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Rice and Sons	4,949
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Lathey Bros.	4,575
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W. J. Fryer and Co.	4,371

Pensarn (Denbigh).—For alterations and repairs to Council school. Mr. J. Owen, Menai Bridge and Holyhead, architect.

J. Owen and W. Williams	£1,918	0	0
O. Jones	1,885	0	0
J. and J. W. Owen	1,818	9	0
R. Thomas	1,478	0	0
O. Thomas,* Amlwch	1,450	0	0

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(*Tenders continued on page viii.*)

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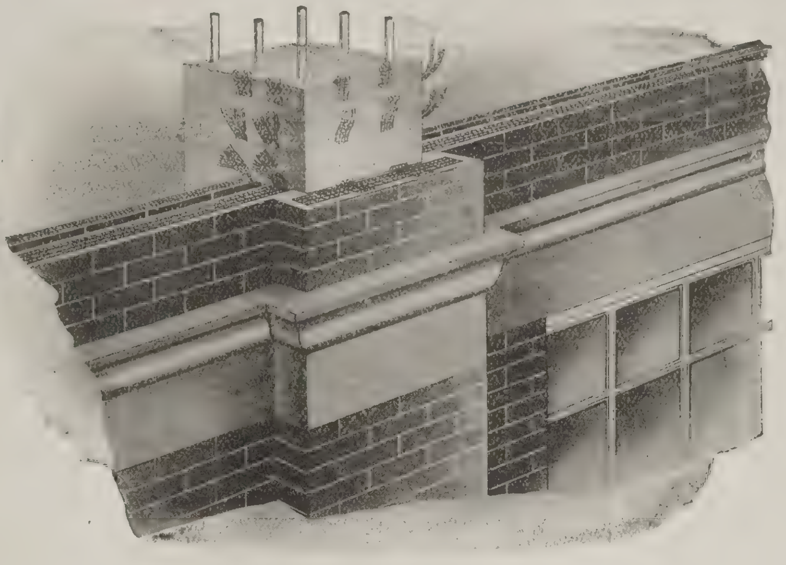

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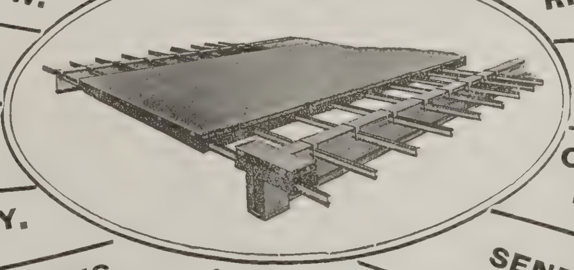

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J. Garrett and Son, Balham Hill	35,806	0	0
McCormick and Sons, Ltd., Northampton Street, Essex Road	33,779	0	0
W. Lawrence and Son, Waltham Cross	33,433	0	0
Kirk and Randall, Woolwich	33,368	0	0
Treasure and Son, Ltd., Holloway	33,012	0	0
J. and M. Patrick, Wandsworth	32,990	0	0
Patman and Fotheringham, Ltd., Park Street, Islington	32,741	0	0
W. Johnson and Co., Ltd.* Wandsworth Common	32,633	15	11

Architect's (Education) estimate, £31,473.

*Recommended for acceptance.

London, S.W.—For the making-up and paving of Badminton Road, Balham, for the Wandsworth Borough Council. Mr. P. Dodd, borough engineer.

Potter and Co.	£1,150	0	0
E. and E. Iles	1,075	0	0
R. W. Swaker	1,074	9	9
R. Dykes	1,070	0	0
T. Adams	1,034	0	0
J. Mowlem and Co., Ltd.	1,028	0	0
E. Parry and Co.	1,006	0	0
Harringdon and Co.	1,005	0	0
S. Lane and Co.*	945	0	0

Borough engineer's estimate, £999 10s.

*Recommended for acceptance.

London, S.W.—For the making-up and paving of that part of Welham Road, Streatham, which lies between Mitcham Lane and Ribblesdale Road, for the Wandsworth Borough Council. Mr. P. Dodd, borough engineer.

R. Dykes	£1,581	0	0
S. Lane and Co.	1,476	0	0
J. Mowlem and Co., Ltd.	1,413	0	0
T. Adams	1,408	0	0
Harringdon and Co.	1,408	0	0
E. Parry and Co.	1,395	0	0
Potter and Co.	1,390	0	0
Grover and Co.	1,359	6	3
E. and E. Iles	1,309	0	0
R. W. Swaker*	1,121	3	3

Borough engineer's estimate, £1,370.

*Recommended for acceptance.

London, S.W.—For making-up and paving Wyatt Park Road, Streatham, for the Wandsworth Borough Council. Mr. P. Dodd, Borough engineer.

R. Dykes	£1,744	0	0
Potter and Co.	1,660	0	0
J. Mowlem and Co., Ltd.	1,593	0	0
E. and E. Iles	1,570	0	0
T. Adams	1,545	0	0
S. Lane and Co.	1,531	0	0
E. Parry and Co.	1,480	0	0
Harringdon and Co.	1,468	0	0
R. W. Swaker*	1,306	8	1

Borough engineer's estimate, £1,498 4s. 2d.

*Recommended for acceptance.

Newbury.—For erection of cottages, for the Town Council. Mr. S. J. L. Vincent, borough surveyor.

G. Whiting	£1,961
A. T. Chivers	1,870
Hoskings Bros.	1,851
Edwards	1,806
Plumb	1,783
H. Elms	1,700
A. M. Hedge	1,618
Hedges Bros.	1,578
T. E. Townsend	1,550
Houghton and Hitchman	1,549
G. Elms	1,515
S. Bastin*	1,495

*Recommended for acceptance.

Rhosesmor, Holywell, N. Wales.—For the erection of new Welsh Calvinistic Methodist Chapel. Messrs. Jos. Owen and Son, architects, Liverpool.

Messrs. J. Hayes, Shrewsbury	£3,490
Messrs. Sibeon Bros., Holywell	3,333
Mr. A. B. Lloyd, Flint	2,700
Mr. R. Williams, Brymbo	2,391
Messrs. R. Jones and Sons, Holywell	2,100
Mr. M. S. Rogers,* Flint	1,770

*** Accepted.**

Southend.—For the building of messroom and enlargement of the Southend-on-Sea steam laundry, for the directors. Charles Cooke and Son, architects, High Street, Southend-on-Sea.

Smith and Chambers	£446	13	4
E. and B. H. Davey	360	0	0
H. E. Campkin	355	0	0
Frank Davey*	343	0	0

***Accepted.**

Stapleford.—For the erection of a combined house and shop, Nottingham Road, Stapleford, for Mr. A. Gilling. Mr. Arnold Plackett, architect, Central Chambers, Long Eaton. Quantities by architect.

Mr. H. W. Moult, Stapleford	£792	10	0
Messrs. Donnelly and Sons, Kimberley	780	0	0
Messrs. Perks and Son, Long Eaton	745	0	0
Messrs. Brown and Son, Long Eaton	745	0	0
Mr. J. Bull, Long Eaton	745	0	0
Mr. F. Martin,* Stapleford	710	0	0
Mr. E. E. Stevens, Long Eaton	699	0	0
Mr. R. J. Warren, Long Eaton	698	0	0

***Accepted.**

Stanley (Durham).—For erection of new Council offices in Front Street, Stanley, for the Stanley Urban District Council. Mr. John W. Wilson, architect, 3, Coleshill Street, Sutton Coldfield.

J. Jennings, South Shields	£4,819	19	3
Dyson Bros., Pelton	4,636	14	8
W. Weatherley, Newcastle-on-Tyne	4,606	0	0
A. R. Davis, Burnopfield	4,522	2	0
L. Jobling, Birtley	4,493	8	4
E. T. George, Newcastle-on-Tyne	4,480	0	0
I. Bewley, Dunston	4,440	0	0
J. W. White, Sunderland	4,420	0	0
B. Bolam, Birtley	4,301	2	7
W. Hall, Gateshead	4,277	19	0
Reynoldson and Son, Dipton	3,838	0	0
Dallow and Sons, Blackheath, Birmingham	3,750	0	0
Southern, Dipton	3,720	0	0
T. H. Worley,* Tantobie	3,499	14	4

*Accepted.

Shirebrook (Derbyshire).—Accepted for erection of girls' new school at Shirebrook, for the Derbyshire Education Committee:—
F. Martin, Stapleford, £4,722.

Tividale, near Tipton.—Accepted for erection of new infants' schools at Tividale, for the Rowley Regis District Council:—
E. J. Chattle, Lichfield, £2,420 15s.

Tredegar (Mon.).—Accepted for erection of a temporary male dormitory and dayroom at the Workhouse, for the Guardians of Bedwellty Union:—
Smith and Co., Stratford, £639 15s.

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THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

This issue contains the Official Reports of the National Building Trades Federation, and articles of special interest to Builders and Contractors.

Caxton House, Westminster.

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Coloured Buildings.

Mr. Halsey Ricardo wants "to see the streets of our crowded towns bright and splendid with colour," and in furtherance of this desire he gladly responded to an invitation to open a discussion by the Architectural Association Debating Society—a most useful institution, whose proceedings deserve much more attention than they have yet received—on the proposition "That external colour decoration is necessary to the completion of town architecture." Mr. Ricardo's support of this proposition was no merely perfunctory effort. He has long been an earnest advocate of the principle involved; and on this occasion he supported the thesis with heart-whole sincerity and with almost poetical fervour. He claims, without much risk of contradiction, that the craving for colour is innate and instinctive. The demand for it is imperative. And yet, as he says, "for half the year our city is the colour of a dirty cobweb, and the only refreshment the eye gets is in the glimpses of the sky overhead, the shop windows, and the hoardings," the latter significantly marking the hunger for colour. The only question is: By what external treatment can our buildings be made to gratify the certainly growing demand for colour? Mr. Ricardo thinks that, if permanence of material is to be a prime condition, glazed surfaces—glazed terra-cotta, glazed bricks, tiles, and glass mosaic—supply the answer. The contemptuous disdain of "crockery-ware" frontages has then to be reckoned with. Mr. Ricardo apparently feels confident that this objection will disappear when these materials are employed with greater taste and propriety; and the contention that these surfaces glare unpleasantly loses much of its force in a sombre climate like ours. The alternative is paint, and plenty of it. "Paint," says Mr. Ricardo, "especially water paint, is what one ought to indulge in profusely." He admires, only less enthusiastically than did Mr. Max Judge, in his excellent descriptive article contributed to this journal, the colouring of the Athenæum Club, but regrets that in this instance the Decorative Committee did not show greater daring. The plea is for greater audacity, for positive blazonry. Colour in delicate and subtle suggestion is omnipresent. A plain brick wall in the sunlight has more tints than the painter could find on his palette, but most of them are perhaps only visible to the most sensitive eye, and then only upon rare opportunities. The danger is that the broad masses of colour which would bring joy to the man in the street might mean æsthetic agony to the artistic soul. The proposition, however, was carried after a somewhat listless—or, as one may say, colourless—discussion, in which several of the speakers extolled the amenities of whitewash; while one gentleman threw out the very practical suggestion that reinforced concrete, possessing no natural beauty of surface, offered a good field for colour. A point that seems to have been overlooked—or was it thought to be too obvious to need emphasis?—is that the new Town Planning Act may give that very necessary control of colour which has been hitherto lacking. Riotous anarchy of colour in our streets is appalling to contemplate; whereas, some well-devised general scheme of external colour decoration would probably disarm most of the adverse critics.

Inspiration and Imitation.

One advantage of "movable" conferences, such as those held by the National Federation of Building Trades Employers, is that they afford the means of instructive comparisons between the notable buildings of the various towns visited. The half-yearly meeting at Portsmouth last summer, for instance, when the Federation delegates met in the magnificent town hall, lent much additional interest to one's view of the grand town hall at Leeds, in which city the conference of secretaries was held in October. The one building is strongly reminiscent of the other. This resemblance was duly noted in a lecture delivered last week by Mr. Butler Wilson before the Leeds and Yorkshire Architectural Society on "The Life and Work of Cuthbert Brodrick." That the similarity is by no means accidental may be inferred from the fact that the architect of the Portsmouth building, Mr. William Hill, F.R.I.B.A., was a Leeds man, while the contractors, Messrs. Armitage and Hodgson, were also of Leeds. The Leeds influence on Portsmouth is therefore natural. Rather curiously, the Leeds tower, as Mr. Butler Wilson reminds us, was an after-thought. We can hardly agree with him that "it is only by a stretch of the imagination reminiscent of Wren's city churches and the western towers of St. Paul's." On the contrary, the resemblance immediately impresses the Londoner, and it seems hardly more possible to suppose that Brodrick was not inspired by Wren than that Hill was not indebted to Brodrick; and we do not see that in either case the fact detracts from the merit of the design. So far as a merely mental comparison of the three buildings can serve us, we should say that the resemblance is merely general, and of the character of a strong family likeness; which, as Mr. Butler Wilson remarked, extends to the towers of at least two other town halls, those of Bolton and Morley. Neither Brodrick nor Hill was guilty of plagiarism. They simply adopted the soundly sensible and scholarly course of following or adapting models of established excellence; which was exactly what Wren and Inigo Jones, and Brunelleschi, and all the great masters, always took care to do; but they did it with splendid discretion. Between inspiration and imitation there is a world of difference.

The Education Question.

There was no whit of exaggeration in the statement made the other day by Mr. J. L. Ball, Director of the School of Architecture, at the Municipal School of Art, Birmingham, to the effect that all who are interested in architecture as a fine art have long felt grave anxiety about the education of architects in this country. Mr. Ball was no doubt only too accurate, also, in his statement that the old relation of master and pupil, admirable in theory, and successful enough under favourable circumstances, has in the main broken down under the changed conditions of modern life. He was on less firm ground, however, when—unless he has been misreported—he said that "it was proposed to substitute for the old premiated pupilage—at its best a somewhat casual and haphazard arrangement—a systematic course of training in an architectural school." If for "substitute for" we may be permitted to read "supplement," we shall probably be nearer a consensus. Perhaps that is what Mr. Ball means; for he goes on to state that after two years of training at the school the student would enter an architect's office, still devoting part of his time to working in the school, and it is only reasonable to suppose that the architect would require him to be articled and would demand a premium. The old system, we take it, is not to be eradicated, but is to be profoundly modified. Before this reform can become general, there is very much to be done. Local facilities for the kind of training required are very inadequate. There are outlying districts whence it is impracticable to send the student to London, or Liverpool, or Birmingham, or Edinburgh, for his school training in architecture. Then, even where distance is no barrier, and expense is not a prohibitive consideration, there is the obstacle that at present the master cannot be compelled to send his pupil to school. Various architectural associations are doing splendidly enlightened and courageous work in promoting the claims of architecture to consideration by universities and schools; but co-ordination, and perhaps some form of compulsion—whether moral or legal—seems to us to be a crying necessity of the case, if we are to avoid cross-purposes, a lamentable waste of effort, and chaotic differentiation of results. Anxiety as to the education of the architect will not be allayed until the status of the architect is more strictly defined and more firmly established. If the Royal Institute can obtain the powers it is seeking from Parliament, plenary authority over the education of the architect may be expected to follow as a matter of course, and the Institute will be able to exercise as much educational control as that which is entrusted, for example, to the incorporated lawyers or the Council of Legal Education. Until then we must rub along as best we can. We must not stand still, however, awaiting events that may never happen; and hence we are glad to welcome and encourage such plucky endeavours to grapple with the subject as those which are being made at Birmingham and elsewhere. Nevertheless, the education of the architect is a subject of national, rather than of local, concern and importance. We might go even farther and say that it should assume an international character, but that were to risk leaping a chasm that may soon be safely bridged.

The Imperial View.

The annual dinner of the Tyne and Blyth District Building Trades Federation, held last week in Newcastle, was remarkably fortunate in its principal speakers, who dealt trenchantly with several matters of momentous interest to the building industry. Councillor J. T. Armstrong, of South Shields, in demonstrating the usefulness of the Federation, cited the following clause from the "conditions" which a certain municipal authority sought to impose upon the contractors: "In the event of anything evidently necessary to the due and complete performance of the works being omitted to be shown in the drawings, or being omitted to be described in the bill of quantities and specification through oversight or error or otherwise, the contractor is, notwithstanding, to execute in the most perfect and complete manner all such works as if they had been severally shown and described, without any extra claim or charge, according to the direction of the architect and to his satisfaction." That, he said, was the sort of thing the Federation was trying to put down. He did not elaborate an argument; the bare quotation was sufficient, and was, as Mr. J. W. White observed, "a nice quiet way of administering the castigation that such a condition deserved." This speaker addressed himself more particularly to the great burdens that have been recently imposed on employers by legislative interference. He was dissatisfied with the administration of the Workmen's Compensation Act. The way in which claims are being dealt with by county court judges is significantly indicated by the fact that insurance rates are still going up, and he threw out the valuable suggestion that such cases ought to be tried by medical referees. The President (Mr. W. T. Weir, of Howdon-on-Tyne) also foreshadowed an important item of constructive policy. Complaining that while the majority of builders were contributing very largely to establish and maintain the Federation, there were some who were deriving all the benefits for which the members of the Federation are working and paying, but who would, nevertheless, neither stir a finger nor pay a penny, he added that apparently the same observation applied to the architects and the quantity surveyors. "Those professions," he said, "had established associations for mutual protection, yet there were men who kept outside, and whenever they got the chance undercut and took work at any price. He hoped that the time was not far distant when the builders, and the architects, and the quantity surveyors, would so co-operate with each other that it would be impossible for that sort of thing to happen." Certainly we see nothing Utopian in the prospect. Such a defensive alliance is well within the bounds of possibility. It is only necessary to devise some mutually satisfactory means of linking up the various organisations into a larger federation. Such an imperial policy, such a consolidation of building interests, is being constantly and consistently advocated in these pages, because we realise very clearly that architects, quantity surveyors, and contractors, having very many interests in common, ought therefore to sink all minor differences, and combine for mutual advantage. It is for this reason that we deprecate as unwise and untoward any exaggeration of merely sectional grievances or antipathies, or any course of action that has a tendency to destroy the better understanding which is rapidly becoming established as between the professional and the practical elements of the great industry which it is our earnest endeavour to serve, not sectionally, but as a whole. Adopting a homely and hackneyed but expressive phrase, we may say that we conceive the professional man and the man of business to be in the same boat, and we want to see them pulling together.

Posthumous Honours.

Seldom indeed is the memory of a great architect accorded national honours. Usually he rests in an unregarded grave. This, for the greater part of a century, was the unmerited fate of Pierre C. L'Enfant, who, as readers of this journal need not be informed, was the Father of American architecture. Some months ago the "Western Architect" called attention to the fact that the remains of L'Enfant were contained in a grass-covered deserted grave in a farmhouse yard in Maryland. Now, in the words of our contemporary, "with the honours of war [let it not be forgotten that L'Enfant held the rank of Major] his remains are conveyed to the capitol of the nation, and the Vice-President of the United States that he served, and the ambassador of his native country, tell the vast assembly gathered to do honour to his memory of the life and work of L'Enfant, and he is buried at Arlington with the highest honours the nation accords to its military dead." We must confess to serious misgivings on two points—whether it would not have been, on the whole, more seemly to leave the poor ashes undisturbed after a century of neglect; and whether the extraordinarily belated honour was not accorded to the soldier rather than to the architect. But, anyhow, let it pass for a pious act, promptly enough performed when once the national conscience was awakened, and all the more graceful and generous from the circumstance that L'Enfant was of foreign birth.

Our "Edition de Luxe."

Our publishers announce that the demand for the "Builders' Journal Edition de Luxe," which is an extra number, dated December 31st, and to be issued at one shilling net, has, up to date, exceeded all anticipations. Guided by the experience of last year, when many regular subscribers expressed their keen disappointment at being unable to obtain the special issue, we have this year arranged for a greatly increased supply. The private orders, however, are already so numerous as to give rise to the expectation, amounting almost to certainty, that those subscribers who make late application will not be able to secure copies. Unfortunately, the supply cannot be regulated to correspond with the demand, because the earlier sheets of the work are already printed. As we earnestly desire that regular subscribers, who undoubtedly have the first claim to consideration in this matter, may not again be balked of their desire to possess this splendid special issue, we again urge them, in order to gratify their own desire and our very natural wish to accommodate them, to send at once for the copies they require. The wish to possess this fine special issue is easily understood. It contains not only a large and important section dealing with the very remarkable development of American architecture, with fine illustrations of the most important buildings in the United States, portraits of notable American architects, and pithy accounts of their careers and achievements, but, further, it gives a series of splendid illustrations of the most important current work of some of the leading British architects of to-day. Again, it deals succinctly with the progress that has been made during the year in the rapidly expanding field of reinforced concrete work, a subject on which this journal may claim to be the best informed of all trade papers. The building events of the year, and the chief transactions of representative professional and industrial organisations, are also chronicled, while the proceedings in Parliament affecting the profession and industry of building will be tersely summarised. Altogether the Edition de Luxe will be found to surpass in interest and in value anything of the kind that has ever been issued from the press. In mere bulk it would be an unrivalled monument to publishing enterprise of the kind; but its intrinsic merits, and its permanent interest render it a really covetable possession, which will be stored and treasured by all who are so fortunate as to secure it. We feel a certain measure of responsibility towards our regular subscribers in the matter of supply; and it is because we are anxious to avoid disappointing them that we again urge them to book their orders without delay.

We are informed that, owing to the great demand for the patent Manchester grate, stove, and ventilators, Messrs. E. H. Shorland and Brother, of Manchester, have been compelled to largely extend their works, and they have accordingly removed to new premises, viz., the Manchester Stove Works, Failsworth, Manchester. The change in address has necessitated alterations in their telegraphic address and telephone number, which now are respectively: Shorland, Failsworth and No. 319, Failsworth, Manchester.

MORE LESSONS FROM MESSINA.

The Stability of Arched Construction.

By A. G. H. Thatcher.

A careful examination of many of the wrecked buildings forced at least one definite conclusion. It is most difficult to give any suggestion for the rebuilding which could be put forward as a rule. There are too many indefinite elements to be considered. One of the first noted was that the rigidity of the structure had to be much discounted on account of the heterogeneous materials of which they are built. Stone and bricks are often mingled in one wall with an occasional addition of tiles and lime concrete. The want of a proper bond in such cases can be imagined, and the shock to these buildings left them a complete wreck. They probably date from the rebuilding after the earthquake of 1783. The mistake should be carefully guarded against on this occasion, although the way in which material is being sorted over and saved suggests the idea that a repetition may occur.

The houses having basements, and consequently deep foundations, were on the whole found to stand better than those on the surface. This confirms a theory which has been put forward that the earth motion is considerably less at a depth of 10ft., even if it does not entirely disappear, than on the surface. Such an argument favours the construction of deep foundations for at least all substantial buildings, providing that the walls at the ground level are of sufficient thickness to withstand the earth pressure under movement. With isolated buildings, an open foundation could often be arranged by excavating areas round the outer walls, and this procedure would appear to be particularly valuable on soft ground, which carries the earth motion most strongly.

With regard to roofs, much will depend upon the construction of the walls. Whether the earth motion is vertical or horizontal, it must be obvious that the collar or tie beams in a trussed roof are subject to considerably more stress than usual, and these members may therefore be considered as especially liable to failure. If such does occur, the resultant thrust, if not sufficient to overturn a supporting wall, will certainly give aid to any other force tending to act in the same direction. If the bond between the walls is sufficient to withstand this, nevertheless the upper storeys may suffer. Also, if the building has overhanging eaves, the roof covering, say, of tiles or slates, may be shot into the streets; certainly a danger to be avoided. Low pitched or flat roofs are pointed to as meeting the difficulty, with low parapet walls and without overhanging cornices.

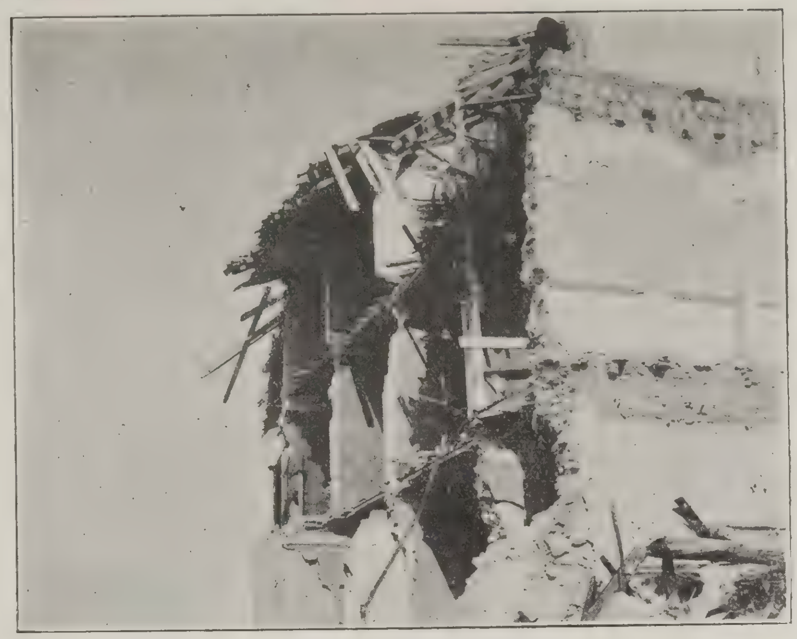

Fig. 2.—Steel Girder Floors at Messina.

The best system of flooring will need some study. Fig. 1 is an illustration of some buildings which have floors built on a method common throughout Italy. Those having a knowledge of the Italian hotels will remember the tiled or mosaic floors with ceilings curved into the walls without cornices. These represent the outward and visible signs of the floors shown on the diagram. The ceilings are practically flat in their centres and curve sharply into the walls. They are or should be built of tiles on edge, with the spandrils filled in with cement concrete and laid with any suitable material to form floors.

In many instances this type of floor was noticed to stand well, even after, as in the photo shown, the external wall had fallen out. Given an immovable abutment, which would depend upon the rigidity of the wall, it is difficult to see how such a floor would fail, sound material and workmanship being granted. Steel joists, well supported or fixed at each end, would probably answer (Fig. 2) in like manner, but should carry a fireproof floor in case of an outbreak. Timber floors for this reason should be tabooed.

It will be seen that the stability of both floors and roofs depends largely upon the walls supporting them. With many of the larger buildings having external walls of considerable strength, these were found to stand, although the interior was gutted. The conclusion is suggested from this that the external walls moved sufficiently to dislodge the bearings of the carrying members of the carcase. It is improbable that the shock caused these to fracture before dislodgement; it is more likely that the reverse took place. From this it should be gathered as imperative that the bond in the building should be sufficient to prevent any inclosing or outward movement of the walls. A reinforced concrete structure would appear to be indicated as most likely to meet the requirements. Steel construction has been used for similar purposes, but would be liable to shed its skin under shock. With a monolithic erection this danger would be obviated. For small buildings, well bonded bricks with steel tie rods and braces should be sufficient. In any case height should be avoided, the buildings to be as squatty as possible. Reference has been made to the danger of openings in the external walls being immediately above each other. This idea can be carried still further. With external walls well tied and bonded, the inner walls might at first sight be considered safe. They probably could be if they continued in one line from exterior to exterior, as in the case of party walls, but where this is not so an inward stress acting upon them from an outer wall might cause disaster. Such walls should be as light as possible, and have no share in the structural stresses of the whole. They should be mere partitions. Another structural defect was noticed—one which probably accounts for many front walls falling out where the rest of the building stood, although badly shaken. It is common in Italy for the rooms in the front of the house to have intercommunication without the necessity of using the corridor or passage. The doorways are generally placed close to the external walls (see Fig. 3), and are, of course, often carried up from floor to floor, immediately above each other. It must be evident that in such cases the bond which should exist between the outer and inner walls is seriously interfered with and broken into small sections. If these doorways are necessary, they should be kept well back towards the centre of the building (Fig. 4), or special means taken to increase the tie above the door heads. This defect can be seen to exist in both Figs. 1 and 2. In the top right-hand corner of Fig. 1 the door itself is seen in position.

It is difficult to decide in favour of a particular method of forming window and door openings. In many cases the skew-back arch seemed to have stood the shock successfully, but agreement may at once be made with Professor Milne as to the danger of an angle being left with arched construction.

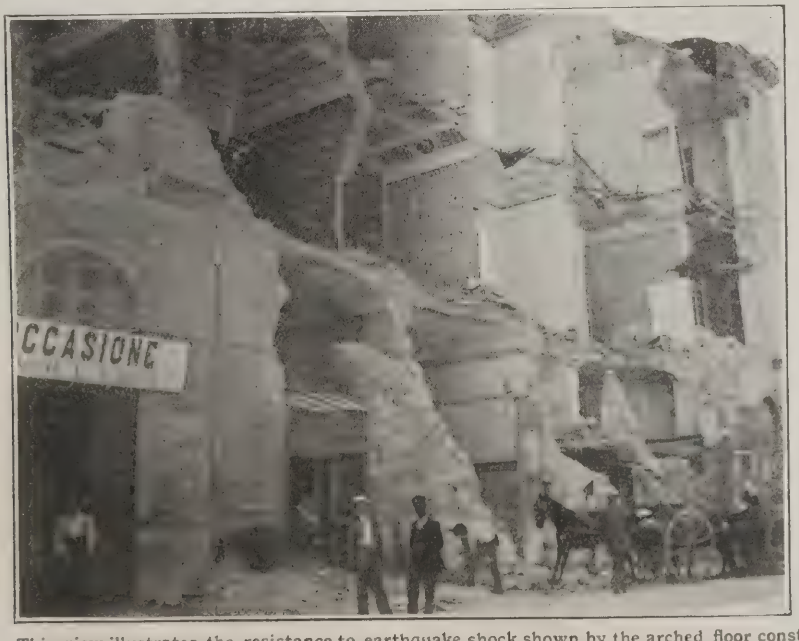

Fig. 1.—This view illustrates the resistance to earthquake shock shown by the arched floor construction common throughout Italy.

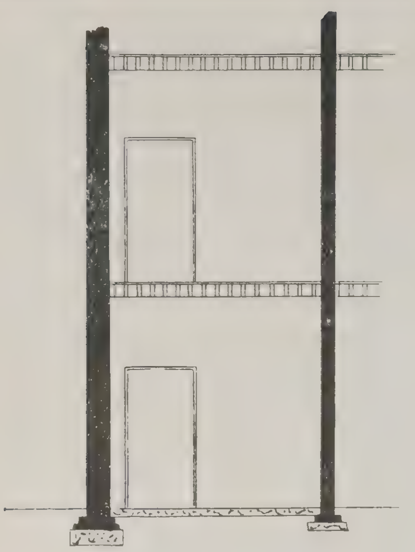

Fig. 3.

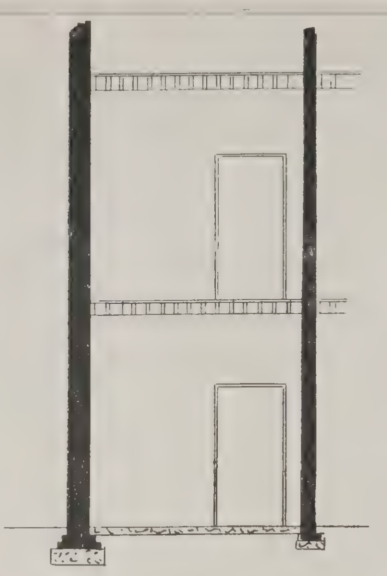

Fig. 4.

Fig. 3 indicates a common form of defect in construction at Messina, the doorways in internal walls being placed close to the outer wall. Owing to the poor tie with the outer walls the latter peeled off the buildings.

Fig. 4 shows how by planning the doorways differently a better bond would be effected between the outer and cross walls.

Particular attention was paid to semi-circular arches over openings. An extraordinary ruin is shown in Fig. 5. Two arches are shown, and the abutments of two others, all in fairly good condition, the superstructure being entirely demolished. It is doubtful if any other form of construction would have remained so stable. They must have been well tested, as being at angles to each other, the earth wave must have affected each differently. Fig. 6 shows some arches at the Post Office. In this case some are at right angles to those shown, the springing of which from the piers can be seen entirely collapsed. Others are to be seen in good order, although the superstructure over the main opening has fallen. So far as could be gathered, it would be fairly safe to use the skew-back in narrow openings with a semi-circular head for those wider.

With reference to iron structures, note was made of several light roofs in the quay side. One, some 60 or 70ft. in length and 40ft. in width, was supported on one side by a wall and the other by columns. It stood well, the flexibility of the structure no doubt proving to its advantage. Several others, similarly constructed, were not in such good order. The wall, however, in these cases had given way causing destruction. How far flexibility as opposed to rigidity can be depended upon for safety, it is difficult to say. Slight structures, such as the statue of Neptune, on the quay side, remained undamaged, but the fountain opposite the Prefecture (Fig. 7) had the upper portion shaken off. This latter photo shows one corner of the Cathedral.

The interior of the Cathedral shows forcibly the damage that can be done by a falling roof.

Heavy buildings, such as the walls of the fort (Cittadella), suffered damage, but chiefly by subsidence. Their slight batter no doubt added to the strength, and this point might be worth further consideration in the erection of large and weighty structures. Buttresses might also be useful at times, and might take the appearance so frequently shown in what are known as Voisey designs.

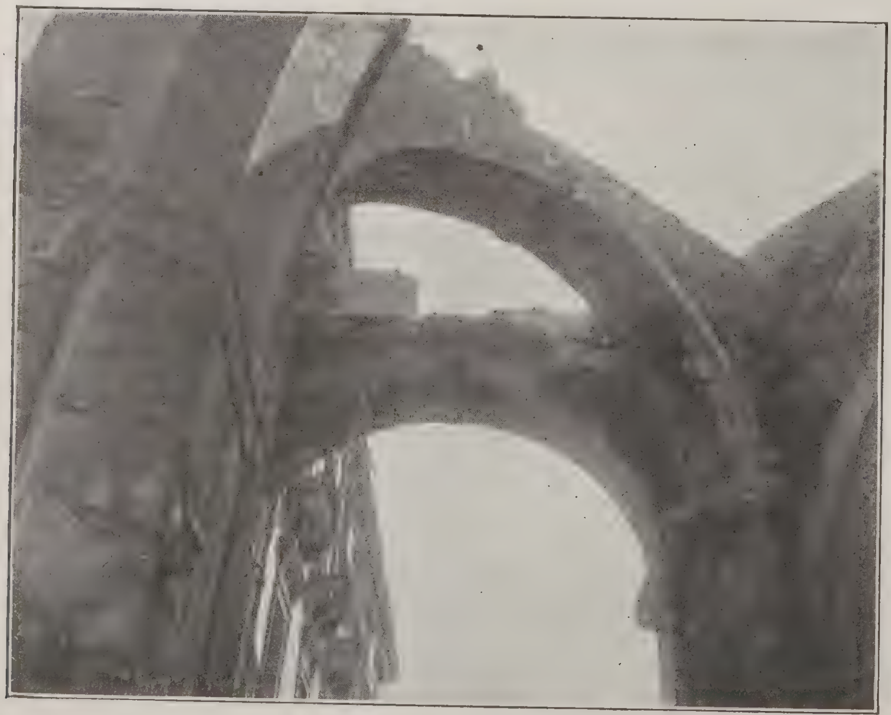

Fig. 5.—A striking view showing the great stability of arched construction.

A system of particularly light construction was seen in the rebuilding of some portions of the railway station. The framework was of wood covered with expanded metal and plastered. In cases where danger from fire was at a minimum such treatment should answer well.

These notes hardly require a summary. They would not be wholly applicable to any one building. A commission appointed by the Italian Government has closely examined the whole of the ruins, and no doubt their report will add to the comparatively slight knowledge obtainable on this subject.

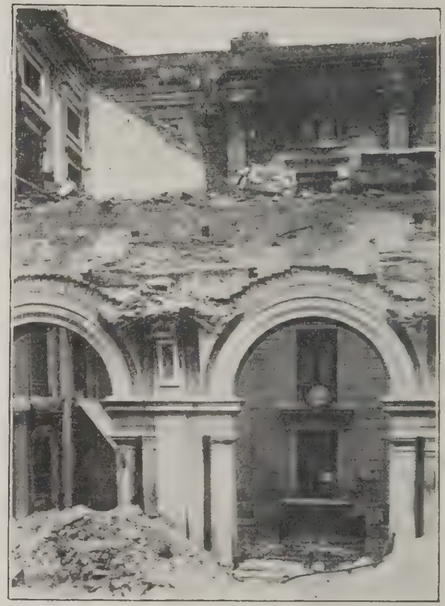

Fig. 6.—Arches at the Post Office.

Our Plate.

This week we show interior views of four of Wren's City Churches—St. Bride's, Fleet Street, St. Swithin's, Cannon Street, St. Mildred's, Bread Street, and St. Mary Abchurch, Abchurch Lane. Not merely for beauty of detail do Wren's City Churches make their appeal to architects, but in the very skilful planning by which awkward sites were contrived to afford dignified and symmetrical interiors.

Mr. Henry Bayly Garling, Fellow of the Royal Institute of British Architects, died on December 4th, at his residence, 25, Clifton Crescent, Folkestone. Born in London in 1822, Mr. Garling was educated at King's College, London. He adopted his father's profession of architect, and whilst a student of the Royal Academy in 1842, he gained the silver medal for measured drawings, and in the following year the gold medal for a design for a Royal Academy of Music. In 1874 he gained the gold medal of the Royal Institute of British Architects for an essay upon sculpture and sculptured ornament. In 1848 he became a Fellow of the Institute, and began to practise, and in 1857 he won in competition the first premium of £800 for the best design for the new War Office, a design which he was never called upon to execute. Lord Palmerston later endeavoured to secure his employment upon the new Foreign Office, but the work was ultimately entrusted to Sir Gilbert Scott. In 1866 he was chosen one of 11 competitors for the new Law Courts, the final choice resting upon Mr. G. E. Street, who carried out the work. Mr. Garling retired from active practice in 1879, and took up his residence at Folkestone, devoting much of his time to landscape painting. He was a great traveller and a great reader, and retained his great intellectual gifts to the close of a long and useful life of nearly 88 years.

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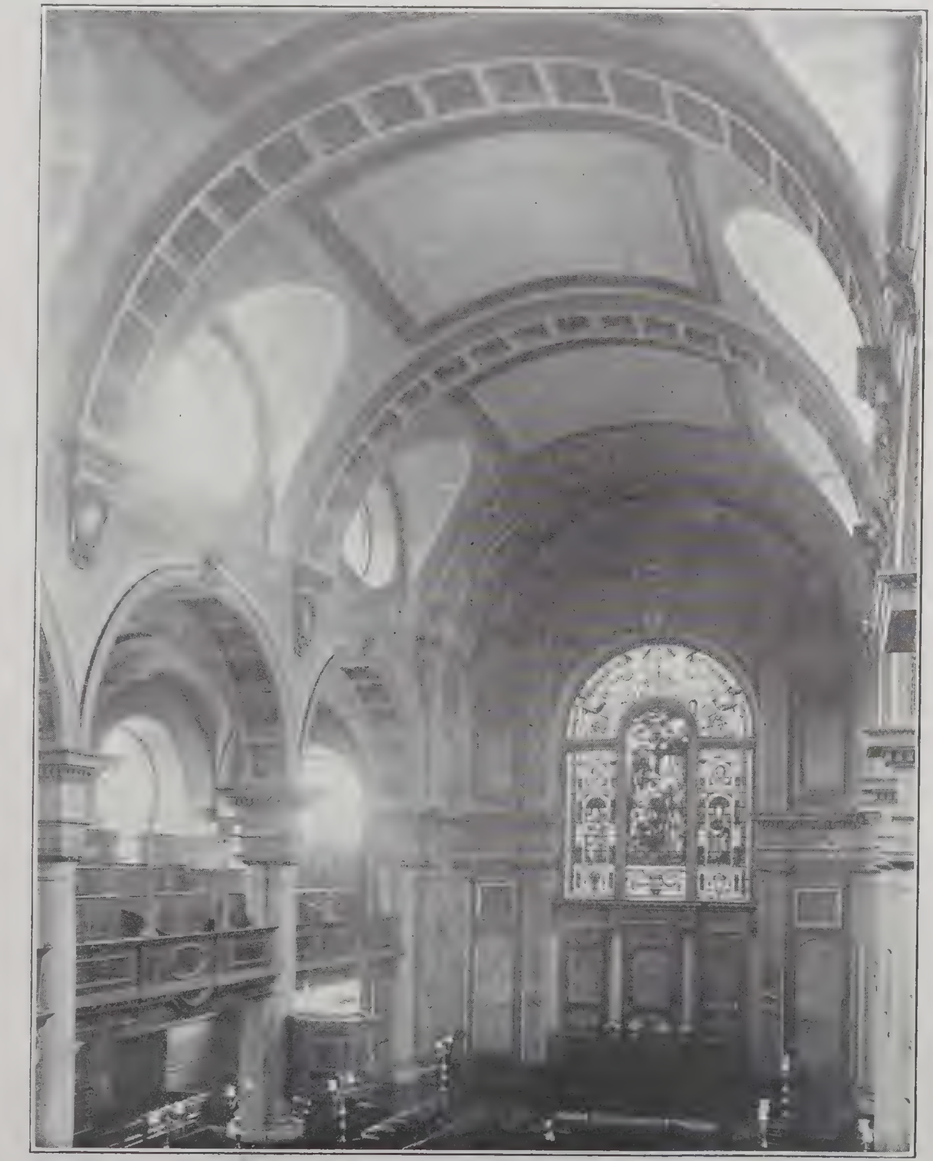
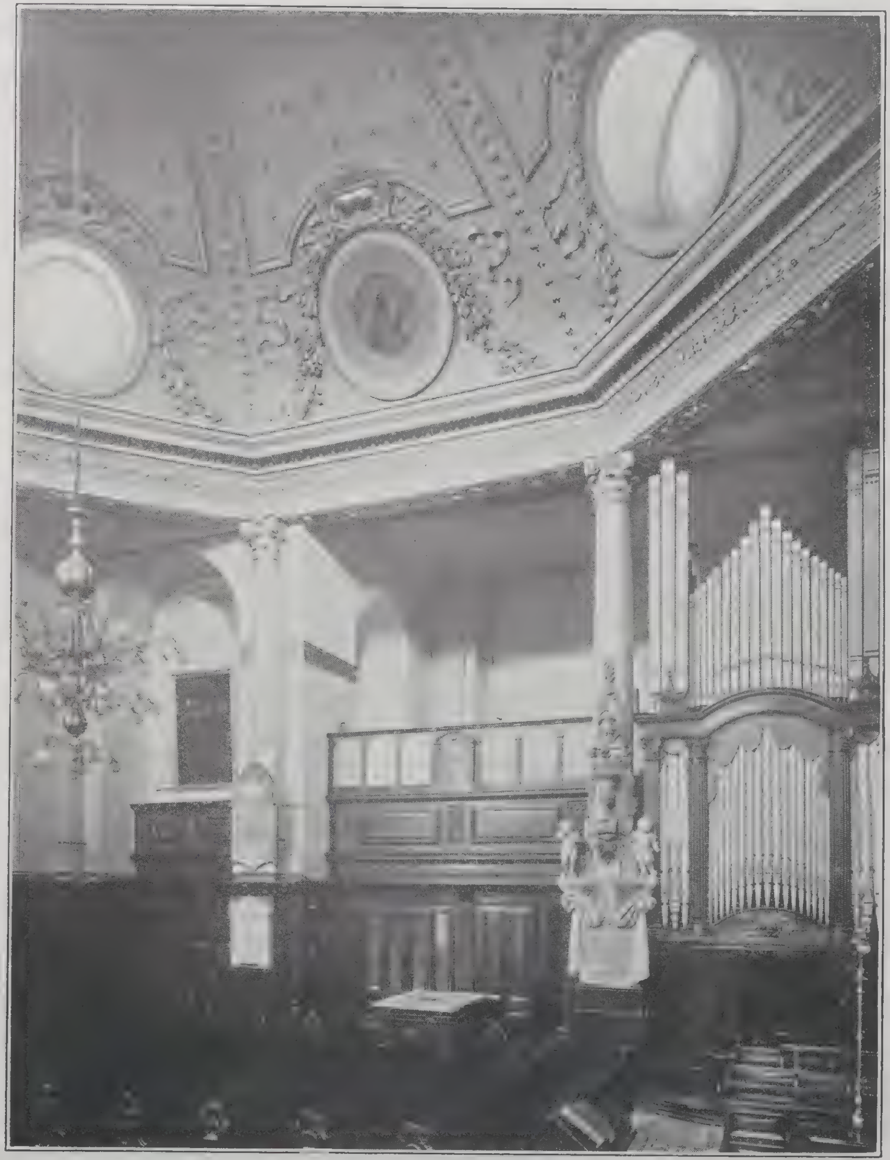
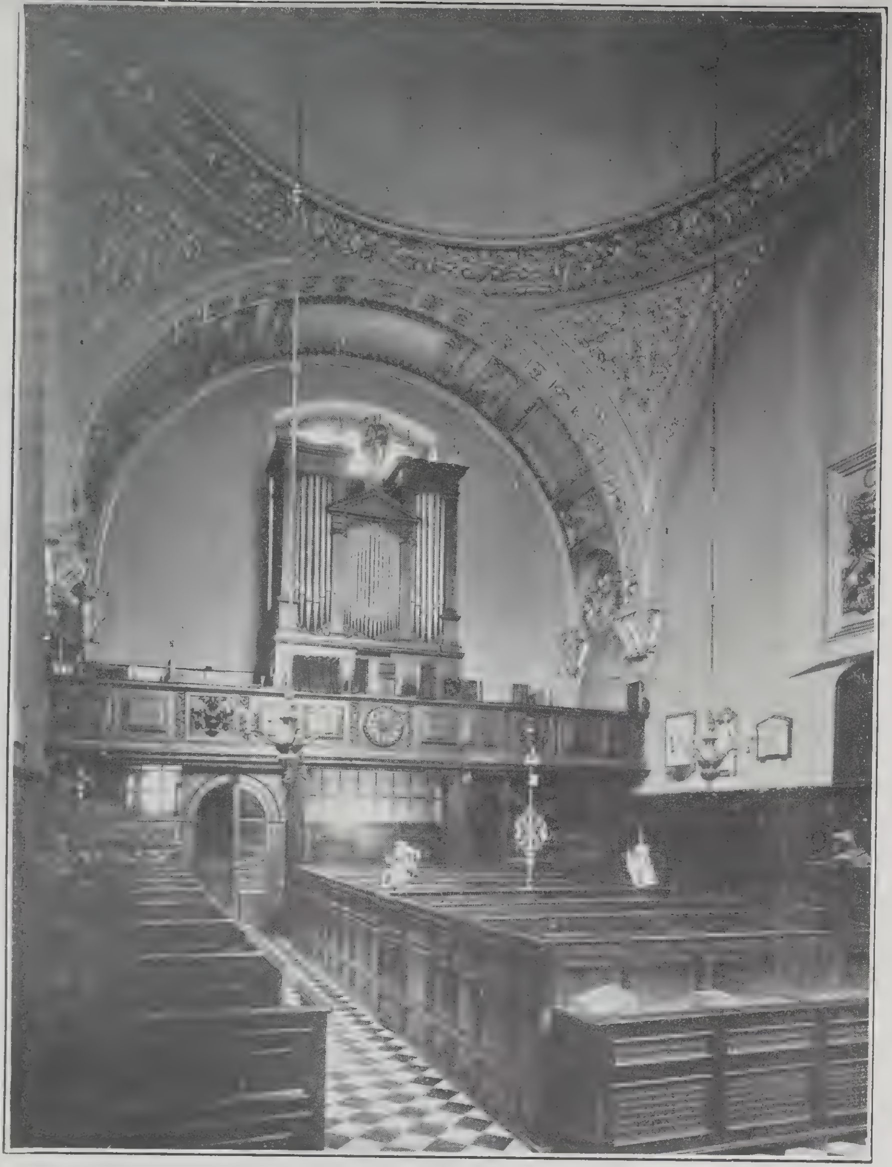


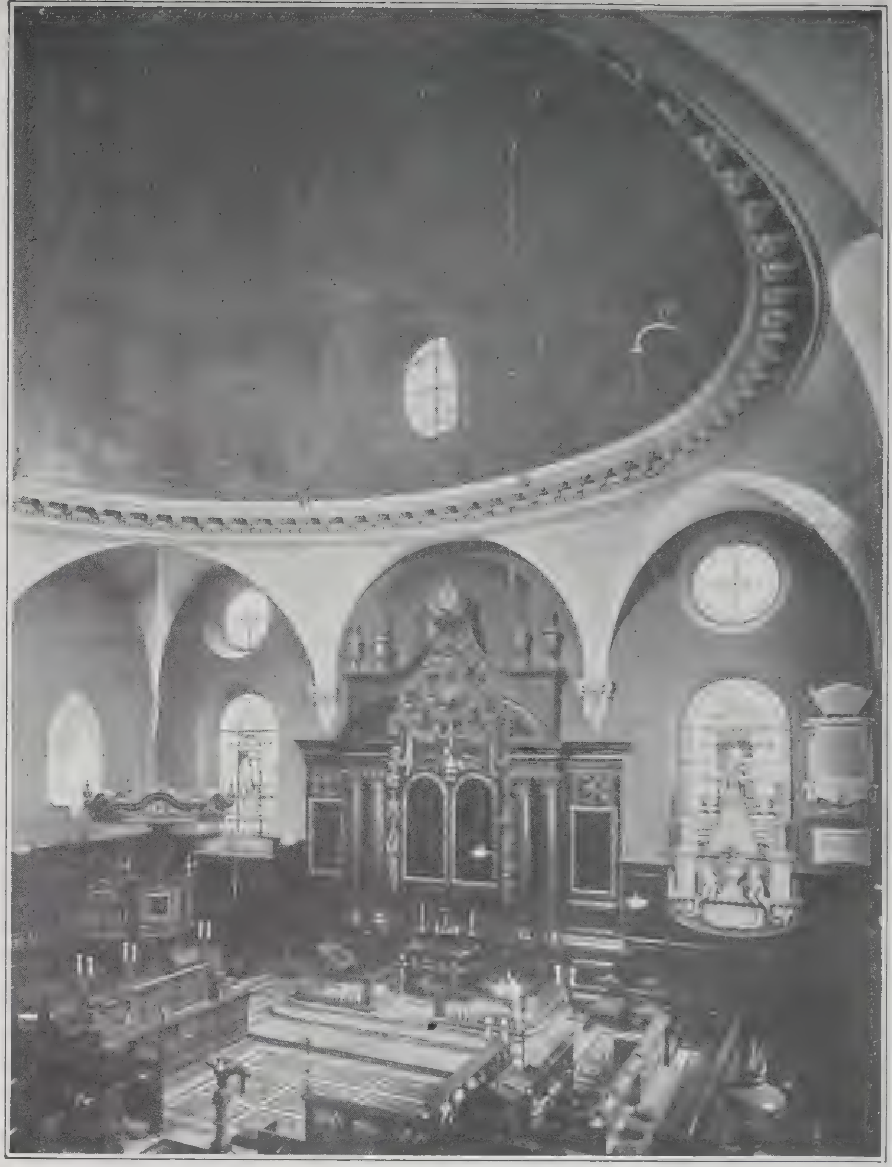
ST. BRIDE'S, FLEET STREET.



ST. SWITHIN'S, CANNON STREET.



ST. MILDRED'S, BREAD STREET.



ST. MARY ABCHURCH, ABCHURCH LANE.

FOUR CITY CHURCHES BY SIR CHRISTOPHER WREN.

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MR. RAYMOND UNWIN ON TOWN PLANNING.*

For the last generation or two, in this country at any rate, the architect has centred his thought upon the individual building which he was commissioned to design, and his total inability to influence the surroundings has led him to a large extent to ignore them. The Town Planning movement, culminating, as it has just done, in the passing of an Act conferring powers upon municipal bodies to lay out the plans of their towns in advance, and to make at any rate a beginning of treating their towns as large units to be considered as a whole with some foresight, calls upon our profession especially to remember that the whole is greater than the part. We must begin to think in streets, in districts, and in whole cities, and henceforth to regard our buildings not so much as isolated efforts, but as units in a larger whole. Town Planning, though in this country almost an unknown art to-day, has been practised in all ages and in many parts of the world; and town plans, when examined, will be found to show an almost infinite degree of variety and individuality.

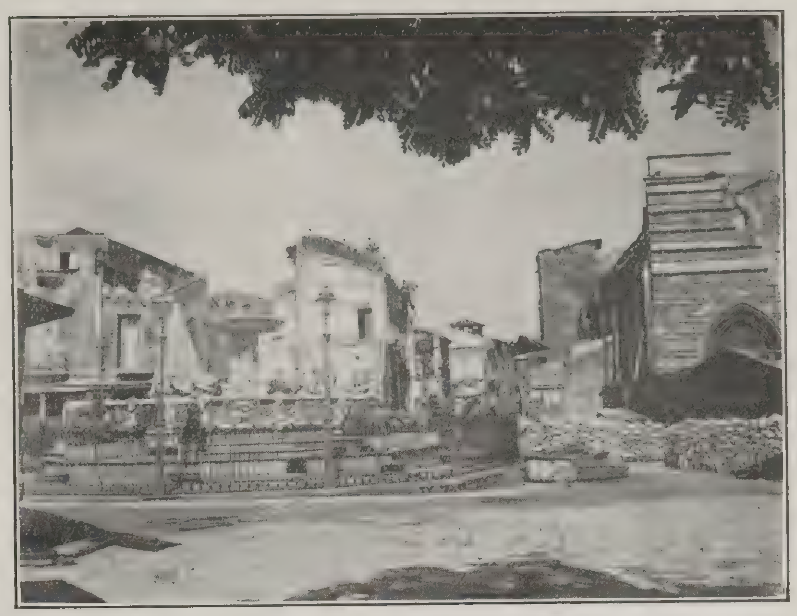

Fig. 7.—Messina Ruins of the Cathedral (on the right), of the Prefecture (on the left), and of the fountain in the City Square (in the foreground).

The Modern Period.

What one may perhaps call the modern period of Town Planning has already passed through several phases of development in other countries, noticeably in Germany, where during the last fifty years there have been developed different styles, characteristic of different periods, showing a growth analogous to the different styles and periods we are familiar with in architecture. As an example of the earlier style as applied to an entirely new town, the plan of Dalny shows evidence of a study of some of the exercises in ideal Town Planning, such as those of Vasari il Giovane and Scamozzi, at the end of the sixteenth century, or of Roland Levirloys at the end of the eighteenth century, with the irregular geometrical plans characteristic alike of Haussmann's work in Paris, and of the German work in the middle of the nineteenth century. This plan is of special interest, as showing the care that was taken in surveying the ground before the plan was made; not only do we find careful contour levels, but also wind and weather diagrams, the prevailing winds and the aspects having both been taken into account in determining the direction of the main roads.

Extension Planning.

In the plan of Cologne, we see town planning applied to the more common case of the extension of an existing town. This plan illustrates also the change in the character of German town planning. In the centre may be seen the irregular street lines, characteristic of mediæval towns, with a few more modern roads resulting from improvement schemes. In the zone immediately outside this area, which was set at liberty by the extension of the fortification lines during the last century, we see the geometrical type of planning, very like much of that which can be found on the plan of Paris. Cologne has again outgrown its line of fortifications, and, moreover, the change in the character of warfare has rendered them obsolete, and the town is now developing suburbs all round. These are being planned by the municipality far ahead of the development, but the geometrical pattern work has been displaced by more flowing lines, showing a marked reaction from the rigidity of the former manner. This may fairly be taken to indicate the intermediate German style and period of German town-planning work. It is very interesting to compare the old plan of Paris with the modern plan, and to see the extent to which Haussmann's geometrical planning has displaced the mediæval irregular street lines of which Paris once entirely consisted.

The Irregular Style.

The influence of Camillo Sitte in Germany, Austria, and the central European countries generally, has resulted in a further development of the curvilinear and irregular style. He advocated a careful study of mediæval town plans, and put forward the theory that these plans were the result of conscious design on the part of a people thoroughly imbued with artistic instinct and tradition; and

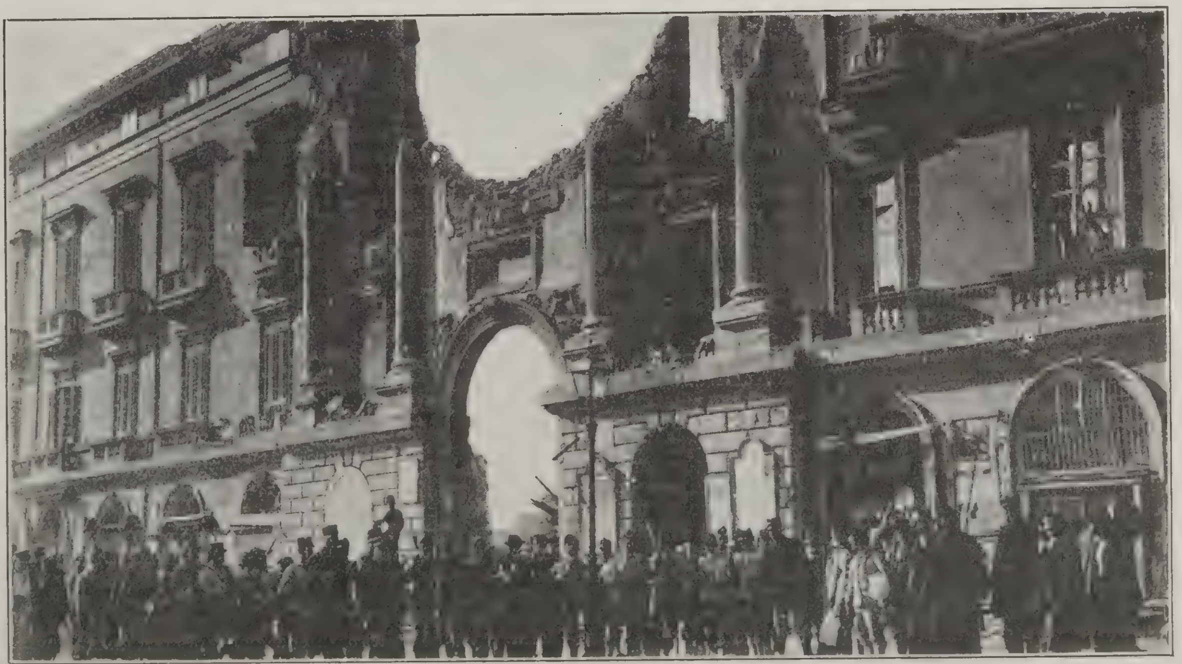

Fig. 8.—Messina: In the ruined buildings on the quay-side an effect the exact opposite to that shown in Figs. 1 and 2 is to be noted. Here the substantial facade wall has stood for the most part, and the poorly constructed building behind has collapsed.

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* Abstract of a paper read by Mr. Raymond Unwin, M.S.A., before the Society of Architects on December 9th.

he deduced some rules and many suggestions as to the causes of the wonderful picturesqueness of mediæval towns and cities. The plan for the extension of the little town of Kufstein is one of the best examples I know of the most modern style of German work in which the town planner concentrates his main attention on the building up of picturesque street pictures. Every street, every junction, and indeed, one may say every view in this plan has been carefully thought out, so that when the buildings arise on the building lines laid down, they may group together in the picturesque manner characteristic of mediæval cities. It will be found also, that although in no direction are there long, unbroken streets, nevertheless, the lines of the roads are so contrived that it is possible to get about the town in all directions, without inconvenience. At the same time, it would not be very easy to plan an extensive tramway system for such a town.

The plan of Marienburg is a very good example of a combination of the two styles of planning. We see certain straight thoroughfares giving a sense of framework to the town plan, while the details are filled in with the irregular streets, planned to produce picturesque groups of buildings so characteristic of the modern German school.

England's Task.

Signs are not wanting that there will shortly be in Germany considerable reaction against the extreme irregularity, and the excessive striving after the picturesque which has marked their recent work. Here in England, we are about to take up this new art of town design. It behoves us to study very carefully all that has been done before. We have the great advantage of being able, if we will, to profit by the extensive experiments in different styles of work that have been carried out on the Continent during the last fifty years. We have in this country scraps of two traditions in town planning. There is the very regular and symmetrical work characteristic of the Renaissance period, when, for a while, large schemes were grasped and sometimes carried out, as we may see in many parts of London, notably, in the squares lying between Holborn and the Euston Road, and in part of the district round Regent's Park. In addition, we find in Bournemouth, Buxton, Eastbourne, and some other towns that have grown up mainly on the property of one great landowner, town plans worked out under the influence of the landscape school of gardeners, consisting of flowing so-called natural lines, but generally speaking lacking in any large grasp or any sense of wholeness in the completed plan. I think it is of the greatest importance that we should, in this country, not make up our minds too hurriedly, as to one style or the other, until we have pretty thoroughly grasped the advantages of both, and the reasons which have led to the adoption of one or the other. I cannot help thinking that we have here, as so often, the elements of a new synthesis, and hoping that it may be within our power to evolve in this country a style of town planning which shall show alike a due appreciation of the beauties of our usually irregular and undulating sites, and of that other beauty which springs from ordered and regular design. The problem before us really is how to weld together into one harmonious whole the undulating surface and irregular features of our country and the definite lines and ordered arrangement characteristic of good design. And, with a view to further illustrating this, I would like to contrast for you two cities.

The Peasants' City.

The first is the peasants' city of Rothenburg, a unique example of unspoiled mediæval picturesqueness, the character of which springs not from the possession of supremely beautiful buildings, but from the fact that in the whole of the town there is hardly one that does not show a simple comely beauty. The plan is interesting as showing how the form of the town has been influenced by the nature of the ground, the line along the west side following the crest of the high ground on the edge of the deep ravine, which has been worn out by the winding Tauber, a small river, the musical murmuring of which, as heard all along this side of the town on a quiet evening, adds not a little to the charm of the place. It is a characteristic mediæval plan, marked by an entire want of symmetry and regularity, subordinated to the double line of fortifications, one dating from the thirteenth and the other from the fourteenth century, beyond the outline of which, except for a small settlement adjacent to the railway station, the town has never developed. But, while lacking that symmetry and order which go to make up a pattern on paper, none the less this plan has in it many of the far more important elements of a good town design. It has, in a marked degree, both scale and framework. Its market place, with the group of smaller places linking it up with the great church, the rathhaus, and the Herrngasse, the great street in which the patricians of the town once lived, form together a centre finely dominating the town, while the roads leading to the main gateways are also marked out in importance by their comparative width and directness. I must not omit to mention the delightful absence of that region of untidy allotments, derelict building sites, and rubbish heaps which form a girdle round nearly all our growing towns to-day; the way in which the unspoilt country comes right up to the wall of the town, inside which the crowded—I must admit, in many cases overcrowded—city commences, has a very fine effect, and one which suggests to us whether there may not be found for our modern suburbs some means of defining and limiting their areas adapted to our modern conditions of life as the town wall was adapted to those of our forefathers.

Before passing from this beautiful little city, which, more than any other I know, carries one back to the time when all building work was governed by a simple instinctively appreciated tradition which seems to have made it as natural to build beautifully as our modern life has seemed at times to make it natural to do the reverse, I would like to emphasise the unity of effect which has resulted from the following of that tradition. Almost every building in the town, including the Rathhaus and the church, is roofed with the beautiful hand-made Rothenburg tile of a quiet brown colour, here and there brightened with touches of brilliant red where the tile has cleansed itself, as such tiles will. The buildings are either built of stone the prevailing tones of which are cream and light brown, or more frequently are plastered and treated with lime-wash of very similar tones. Bits of bright green and grey occur in the woodwork, the whole producing a unity of effect which is quite astonishing to anybody accustomed to the hopeless jumble of materials, colours, styles and forms which characterise the modern town or suburb. And yet there is no lack of variety, for while the general form of the town, the multiple gables and picturesque groups of turrets and pinnacles give it an essentially Gothic character, much of the detail is distinctly Renaissance.

The Ducal City.

Let us contrast with Rothenburg the city of Karlsruhe, which owes its origin to the Margrave Charles William of Baden-Durlach, who transferred his residence thither in 1715, at which date the plan of the town was made. It is now the capital of the Grand Duchy of Baden, and the Ducal Palace forms the central feature of the town. A tower built out on a wing stands on the centre point from which a series of streets radiate to all parts of the town, so planned that this tower is the terminal feature in one direction along all these streets. On the other side, there is an extensive forest, through which straight alleys have been cut, radiating from this tower in like manner. The Market Place is formed on the axis line of the town, which coincides with the central radiating street. Before the Schloss is a large fan-shaped garden place, having the front of the Schloss at the apex with stable buildings, barracks, residences, and a theatre, forming the radiating flanks, while round the circular arc is built up a colonnaded crescent of houses, cut at intervals by the narrow radiating streets. Beyond this crescent, a circular road links up all the radiating streets, while at right-angles to the axial line at the north end of the market place runs a wide straight thoroughfare from east to west, connecting with various diagonal streets, and completing the general framework of the town. This road leads directly to the district of Muhlburg, and to the docks of Rheinhafen, which puts the town in communication with the much used water course of the Rhine. Sufficient of the early eighteenth century buildings remain to enable one to form a fairly good idea of the effect that would have been produced if the town had been entirely built up at that period. It would be difficult to imagine a greater contrast than that between the style of this town and that of Rothenburg. The straight, formal lines of the streets, the geometrically shaped places, the axial treatment of the market place, the regular, horizontal sky lines, and the entire absence of gables, with the symmetrical and regular treatment of the facades, all emphasise this difference, and yet there is the same feeling of unity of effect, the same sense of scale and framework leading up to a definite town centre that marked the more picturesque and irregular Rothenburg.

Much skill was shown in the treatment of the many acute and obtuse angled corner buildings, a very good effect being frequently obtained by very simple means. We cannot fail to notice how such a regular treatment suffers when the style is departed from, and buildings of different heights and different characters break in upon the orderly arrangement, and, I think, we should take warning, and before embarking upon any system which depends for its success on the complete maintenance of very regular lines, make fairly sure that we can see our way to maintain these.

The site of Karlsruhe is a level plain, having apparently nothing of natural undulation or feature within the area of the town, which needed to be much considered by the planner, so that probably in this case the unusual degree of formality of treatment was justified by the conditions. The faults of the plan are the excessive and monotonous insistence of the somewhat uninteresting tower of the Schloss, the large number of acute angled corners and the uncomfortable shape of many of the places, road junctions, and building plots formed.

Its virtues are the definite leading up to a centre, and the interest which each part derives from being a portion of a definite scheme, the easy communication from point to point, and the simplicity of the general framework, which is easily grasped.

Bearing in mind the comparison we have made of the formal eighteenth century city with the informal fourteenth century one, let us pass to consider in greater detail some of the component parts. We have seen that both plans are alike characterised by an extensive use of places of various sizes and forms. The special characteristic of the mediæval place is the sense of enclosure and the completed frame of buildings which is produced; the shape is indefinite. In the market place at Nuremburg, for example, although at first sight there appear to be many roads leading in to the place, and forming breaks in the buildings, it is remarkable how the arrangement of these does, in reality, leave the framework of buildings unbroken. Either the roads are curved slightly after they leave the Square, or their direction is broken, or they are made to pass out at right angles to the line of vision, so that it would hardly be possible to stand in any part of the Square and get a long, unbroken vista out of it. Contrast with this the modern Max Josef Platz, Munich, where the long straight vista at the side of the Theatre breaks up the frame buildings and gradually destroys any sense of enclosure in this part of the place. The

Piazza del Campo at Sienna is another instance of a place of quite irregular form on plan, in which, so far as its shape and arrangement are the result of conscious design, the aim appears to have been mainly to secure the sense of enclosure, and an unbroken frame of buildings. This, of course, was easy with the narrow streets common in mediæval times, in which a very slight deviation from the straight line is enough to close the vista. The market place at Stuttgart is an example of this. We have only to imagine two modern 50ft. streets replacing the narrow ones actually existing to realise how, unless they were very rapidly deviated from the straight, the sense of enclosure in that place would be entirely destroyed.

In Renaissance places, quite different effects were aimed at, regularity and symmetry of shape and architectural treatment are in them the prominent features, and the sense of enclosure is sometimes wanting.

Linking Up Buildings.

The importance of linking up the buildings and producing to some extent a continuity of frame was, however, apparently recognised in the laying out of the fine group of Renaissance places at Nancy. Where the angles or ends would otherwise have been open, they have been to some extent screened by wrought-iron railings, masses of foliage and semicircular loggie or arched gateways. But the importance of enclosure and linking up of the buildings has not always been recognised in the planning of architectural places, particularly those resulting from what I may perhaps call axial treatment. It is not of course the only desirable effect to be produced in a place, but there is a peculiar sense of completeness and unity and a suggestion of quiet and repose which results from this treatment which it is most desirable to maintain in many places. The Amalienborg Platz at Copenhagen is a very fine instance of an architecturally treated place, in which no attempt is made to secure this element of definite enclosure in the place itself. A monument stands on the intersection of the centre lines of the two cross roads, and the four palaces which face diagonally upon the place are each completed by lower wing buildings, affording something of the gateway treatment to the roads themselves, and giving a fine sense of unity to the whole effect. But in reality this place may be regarded rather as the glorified treatment of a street junction than a place in the sense in which we have been using the word hitherto.

Multiple Road Junction.

The Karolinen Platz at Munich is another example of the treatment of a multiple road junction, with a central feature on the axis of the various roads, and with definite architectural treatment of the corners, but lacking any sense of enclosure. In such places one is not tempted to loiter: they are apt to be distinctly draughty. From these, one naturally passes to consider places formed mainly for the purpose of facilitating traffic. Many examples of these may be found in Paris; at points where several roads converge there is usually formed some open space to facilitate the circulation of traffic, and to secure some degree of architectural treatment to the corners of the various streets. The Place de L'Etoile is the largest of these. The whole question of the circulation of traffic, and the best way of reducing the inconvenience which must always arise in busy streets, where several streams of traffic pass in and out or across the main lines, is too large for me to touch upon to-night, and I can only just say, in passing, that there are two widely different views held on the matter. The German school of modern town planners believe that as far as possible multiple road junctions should be avoided, and each branch street is better brought singly into the main street. They consider that many single junctions disturb the flow of traffic less than a fewer number of multiple junctions. On the other hand, the French school of town planners consider it advisable to give long, straight, unbroken streets, converging at certain points where the traffic can rearrange itself all at one point, and pass off in many directions; and in some cases, as in the Place de l'Etoile, it has been suggested that the best way of dealing with the traffic is to keep it always moving round the centre point in one direction, which, although it obliges a certain portion of the traffic to take a rather longer route, avoids the lengthy stoppages of first one stream and then the other, which are otherwise necessary at crowded crossings.

In connection with the new St. Paul's Bridge, which will throw a considerable stream of north and south traffic across the already somewhat congested stream of east to west traffic, at the junction of Newgate Street and Cheapside, the authorities should consider whether it would not be worth while to test the circulatory system here. If it were found possible to open out this corner somewhat, there are the makings of quite a good place, and the lines of three, at any rate, of the roads, and of a fourth behind the Post Office, if this could be opened up, would strike the place like the arms of a turbine, which would render the circulating system peculiarly easy. A carefully made test as to the usefulness of the system would be very valuable at this moment, when we are about to enter upon a town planning period in this country.

The Garden Place.

But not the least interesting type of place is one which we may call the garden place, because it is the one which is likely perhaps to be of most use to us in the planning of town extensions, the part of town planning for which alone powers are given under the new Town Planning Act.

The Schloss Platz, Stuttgart, may be taken as a good example of this type, and, in passing, we may use the example also to indicate in some degree the style of garden treatment suitable to places. I am convinced that the breaking up of places with architectural balustrades, fountains, bandstands, etc., in the great majority of cases is a mistake. Such features have their place, but they should never be allowed to interfere with the general breadth and simplicity of effect which is so necessary, and which forms so much more dignified a foreground for the buildings surrounding the place. A plain sweep of grass, crossed perhaps by paved footways where necessary for pedestrians, following the simplest possible lines, with avenues or masses of tree foliage, when properly placed, is generally an effective treatment, and the money spent in so-called architectural embellishments would be usually better devoted to masking one of the street entrances with a gateway arch.

Where there is difference in level in the place, broad terraces with balustraded walls enabling portions of the ground to be levelled, may add greatly to the effect. But, in garden places, as in gardens, it is necessary to be very clear as to the effect that is to be aimed at, and to be very cautious about introducing any mere embellishments which do not form part of a scheme definitely thought out to enhance that particular effect. Indeed, it is not only in the treatment of places, but in the whole work of town planning that we need to guard against being carried away by the prettiness of our paper plan. While the importance of definite design and orderly treatment is undoubtedly great, it is equally true that only by building up in imagination the pictures as they will appear to the beholder walking about in the streets, can we test our different proposals. Very often things which may look simple and uninteresting on paper will be much finer in effect than other arrangements showing a much prettier paper pattern. If I have devoted perhaps an undue proportion of my limited time to the place, it is because I wish to emphasise specially the importance of introducing a sense of scale and proportion in town plans, and because I believe that a wise use of the place will, more than anything else perhaps, help us to do this. We need a centre point to our design, nay, I would rather say we need many centre points; for it is not by jumbling together many materials and styles of building that we shall produce satisfactory variety in the large areas which modern towns cover, but rather by the careful selection of suitable centre points to each town, each district, each parish, and almost to each building site, or estate. Around these centre points the plan may be grouped, in relation to them the roads would be laid out, and the widths and treatment of them to some extent graded. Around them may be gathered the local public buildings. These centre points in turn may become the pride of the inhabitants, and may tend both to give expression to, and to foster local civic spirit and enthusiasm.

For important centres where the scale seems to need something larger than can wisely be adopted for a single place, the useful size of which is limited, within fairly narrow lines, we may well take some suggestion from the groups of places which are characteristic of so many continental towns and which may be planned, as, for example, at Salzburg, so that not only does the group form a much larger whole and afford opportunities for seeing the Cathedral to the best advantage from many points of view, but from no point of view is it seen without its due background and frame, in that naked isolation which we are so apt to choose for our public buildings. In large, gardened places, where the scale of the whole would tend to dwarf the buildings, the judicious use of masses of trees may have much the effect of breaking up the larger places into groups of places, partially enclosed by the mass of foliage, and in this way the proportion between the buildings and this limited place area may be the one that will be felt.

In Salzburg, the places are irregular in shape, but the same principles may govern us in planning regular and architecturally treated places.

For the town square at Letchworth, such an arrangement has been adopted, where a large garden square seemed most appropriate for the centre of a garden city, while groups of smaller places surround the main public buildings, and the streets are arranged to command a view of these. [On the same slide was shown a group of places adopted as the central feature at Hampstead, laid out on formal lines to suit Mr. Lutyens's Renaissance designs for the whole of the buildings.]

Building Up Street Pictures.

Much that has been said of places will apply to streets also. The building up of street pictures is, indeed, a fascinating art, giving scope for endless variety of treatment. When it is desired to provide a route from one point to another, and no obstacle exists, nor do the contours of the ground suggest any deviation, the obvious course would seem to be to adopt the straight line. The advantages of the straight street are that it lends itself to the production of vistas, that where suitable terminal buildings can be provided at distances not too great, these buildings can be very well seen, also the straight street affords convenient building sites, and all the many conduits, tramways, etc., which form part of the engineering work of a modern town street, are more easily laid in straight lines. The disadvantage of the straight street is that it is liable to become monotonous. The Rue Soufflot, in Paris, leading up to the Pantheon, is a good example, in which the terminal feature is of sufficient importance and interest. The length of the street is not very great, and the whole forms a dignified and beautiful street picture. But where a considerable terminal feature is lacking, and where the length of the street is great, the long converging lines of windows, cornices, etc., become not only uninteresting, but wearisome. When looking down a straight street, the buildings on either side for a short distance are seen at a sufficient angle for the features to be appreciated, and to be interesting; but very soon, owing to the acuteness of the angle of vision, all the features, such as windows and doors, cease to be seen sufficiently clearly to have any interest, and become mere lines of shadow. Where a cross street occurs, a small portion of this vanishing perspective is replaced by part of the side elevation of the corner building furthest from the beholder. A little point of interest is at once introduced. The lecturer showed how this point is emphasised by the different treatment of the two sides of the street, from which it was seen that by a judicious breaking of the building line it is possible to fill the picture with the side elevations of buildings seen nearly square with the line of vision, so that the features are sufficiently well seen to afford interest and variety. In this way, by the introduction of suitable recesses or forecourts, which afford an opportunity for planting trees, it is possible to build up quite interesting and picturesque views on a straight street, and to avoid any large amount of the picture being filled with the converging lines of the vanishing perspective. In the case of suburban roads, where the houses stand far apart in proportion to their height, the street view may with advantage be limited at intervals by bringing some of the buildings close up to the road line, and in this way the street pictures will be greatly improved, not only by the limitation in the distance, but by the framing in of the view.

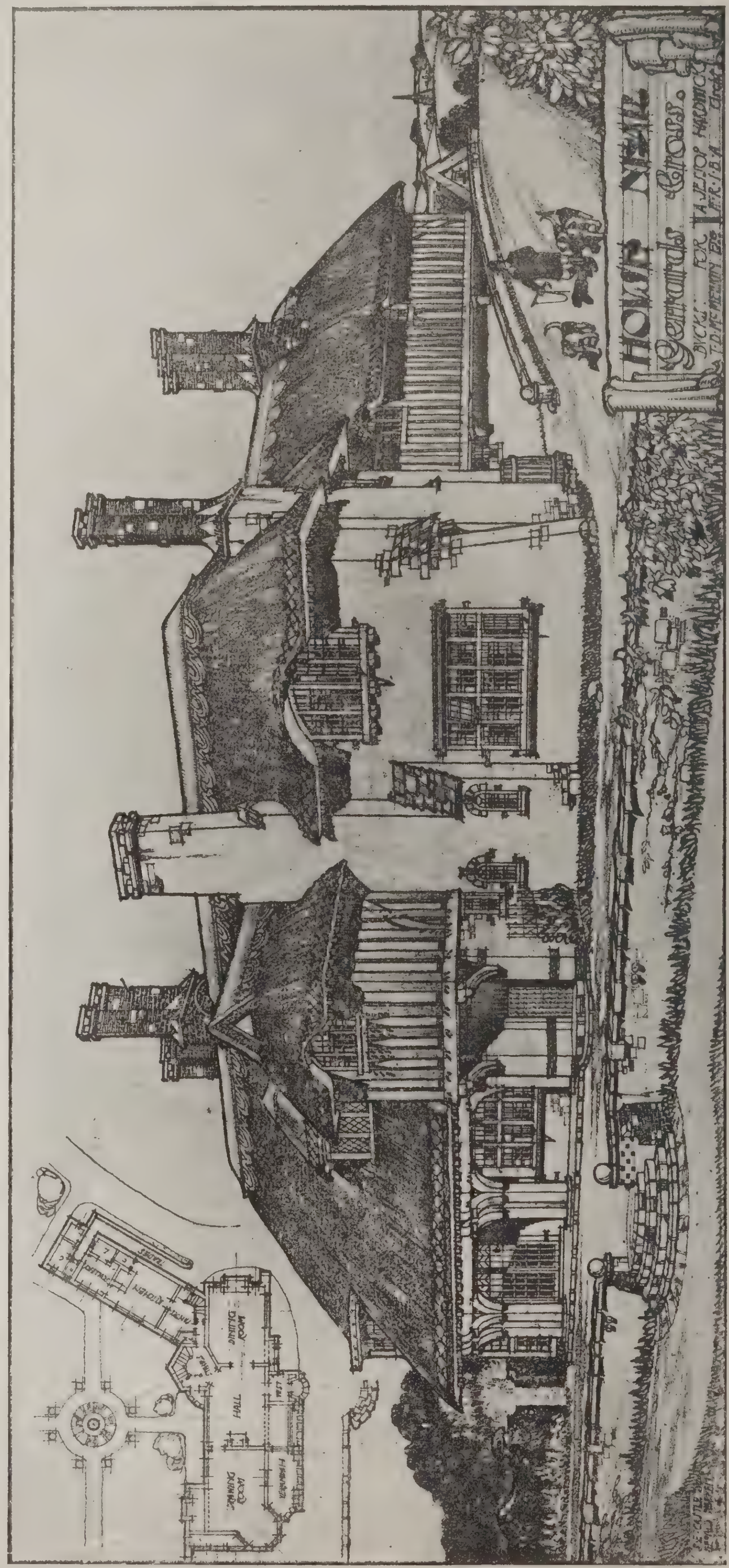
The advantages of the curved street are that it can be more readily adapted to the usually undulating surface of our site, and that there naturally springs up along it an every varying street picture.

[The lecturer illustrated his remarks by passing through the lantern a series of slides of the famous Oxford High Street, beginning from Magdalen Bridge, and terminating with the fine treatment of the Cartax Corner, carried out by Mr. Hare, when the increasing traffic necessitated the removal of the nave of the Church.]

It was to be clearly seen from these pictures how the concave side of the street is the one that chiefly adds interest and variety to the picture, and the curved street is apt to lose on its convex side in proportion to the gain on the concave. If we examine a view of the Regent Street Quadrant, we shall see how rapidly the convex side of the street vanishes out of the picture. Comparing this with the concave side, the buildings on this side of the street are seen at a sufficiently wide angle for the interest of the features to be maintained right up to the vanishing point, and we may also judge of the fine effect which may be produced by a continuous horizontal treatment of a fairly regular curve. But it must not be supposed that a beautiful result necessarily follows from a curved street. There must be sufficient unity of effect and emphasis at the right points. Let me contrast a view of Holborn looking eastward, where we have a jumble of unrelated buildings and the minimum of unity, and where the curve of the street in the distance is marked by no feature of sufficient scale or interest to dominate the picture, with the Karolinen Strasse in Augsburg, where with much true variety of treatment in the buildings, a very much greater unity of effect in attained, and where the Perlach Tower and the Rathhaus beyond form a dominating feature just at the right point in the view.

I think we may say, then, that there is ample place in our town plans both for curved and straight streets, but their use should be governed by some definite purpose, and some definite effect in each should be aimed at, so that we may neither carelessly continue our straight lines regardless of contours, nor imagine that we shall get a good effect by adopting aimless wiggles, merely for the purpose of avoiding straightness.

In the actual planning of our roads and streets, we cannot think only of the architectural effect to be produced. Rather, we must first think of the utilitarian purpose that the street has to serve, and find in each case such a treatment as will within the prescribed limits afford an opportunity for beautiful architectural expression of these particular requirements. While working on paper we must always be thinking in the solid, for it is the massing and grouping of the buildings which we see and which effect


HOUSE NEAR
Gerrards Cross.
BUCKS: FOR T.D. McMeikin Esq.
J.A. Jessop Hardwick F.R.I.B.A. Archt.
HALL
DINING
DRAWING

our picture much more than the actual street lines; and it may often be possible to adopt quite independent lines for the buildings from those which are necessary for the road lines of the street. So important is it to consider the grouping of the buildings that after having determined in a general way the directions which roads must take to provide the necessary facilities for traffic, and to satisfy the engineering requirements, it will usually be found helpful to block out the design in buildings rather than in road lines, because within the very often fairly wide limits which would satisfy the practical requirements, the exact form may be determined wholly on architectural grounds. On residential roads much greater freedom of treatment is possible than in those solidly built up, and particularly those devoted to shopping and other business purposes, and in residential roads we encounter new difficulties, partly owing to the great width between the buildings, and partly owing to the tendency to employ detached or semi-detached units, each different from the others, producing a generally scattered effect in the areas devoted to larger houses, and to the equally monotonous plan of building long rows of smaller houses, all alike, and all alike uninteresting, in the streets devoted to smaller dwellings.

Under the new Town Planning Act, it is in the ever-growing residential areas around our towns that the chief opportunity will be afforded. Centres of considerable magnitude and having buildings of fair importance will need to be provided, where whole new suburbs are growing up on the outskirts of towns; and to these the principles which we have been gleaning from the examples of different styles and periods will be as applicable as they are to those central portions of towns which are not affected by the new Act. But in all streets alike, whether residential or otherwise, we need to consider the total effect first, and the individual buildings as units contributing to that total effect. Much may be done by the careful designing of the building line to give to each street some definite character and unity, and this may be further emphasised by the adoption of definite building materials for definite streets or areas, a common roofing material being of itself enough to give a considerable degree of unity to a district. In the planting of streets also additional emphasis can be laid on the particular treatment adopted.

The tendency, which is becoming so marked, for areas to be developed by enlightened Garden Suburb Trusts, or by Co-partnership Societies, will afford opportunity for a greater degree of grouping of buildings. In streets of cottages and small villas one of the difficulties arises from the fact that the unit is so small and becomes so wearisome owing to the degree of repetition. A great improvement can be made where, instead of rows of houses all alike, a number can be designed as a definite group, and this may be carried further, and three or more of such groups may be designed so that they form together a still larger group. Thus, it becomes possible within limits easily practicable to create units in the street of sufficient size and importance to dominate the picture, although still composed of individual cottages each complete in itself, and with comparatively little variation in the plan and general arrangement.

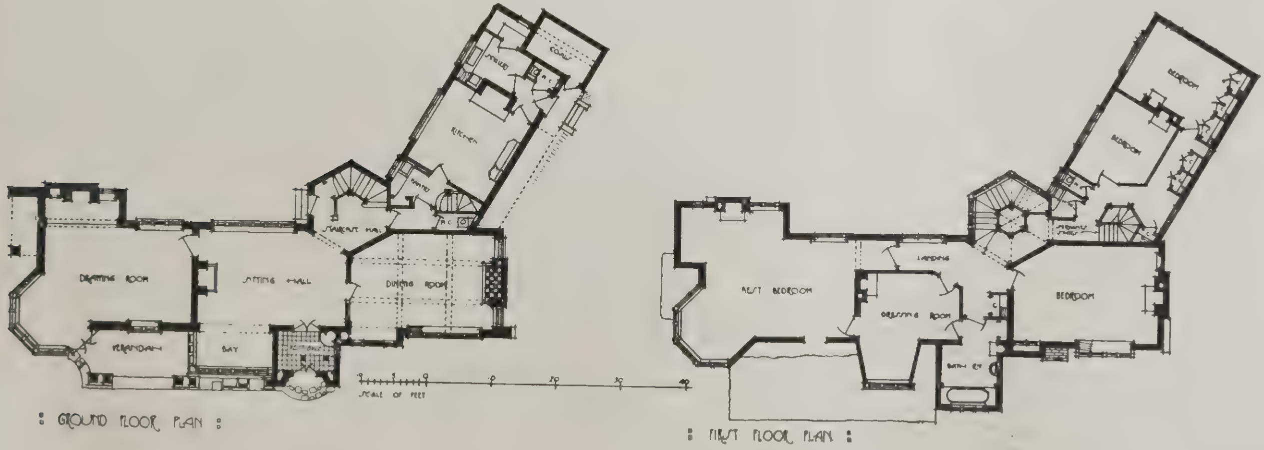
With what a sense of pleasure and relief anyone wandering among the dreary ugliness that abounds in the neighbourhood of Southwark Street, comes suddenly upon the little group of almshouses at the corner of Holland Street. These are as simple almost as the cheapest rows of cottages built, as they are of London stocks, relieved only by coigns; but it is the grouping of these almshouses around the simple grass court which takes approximately a cruciform shape that is so pleasing and affords such a contrast to the surrounding rows. Surely, we may from such groups of tenements as these derive much suggestion for the treatment of residential buildings and roads. In these days, when the main thoroughfares are rendered dusty, noisy, and smelly by much motor traffic, it is eminently desirable that houses should be built just off the main street, and deriving inspiration from our college quadrangles, the groups of almshouses, or the closes of cathedral cities we may, I think, add greatly to the pleasure of life in our suburbs, and to the interest of our suburban roads.

Co-operative City Building.

I want to suggest to you that fine city building which is, after all, the end and aim of the art of town planning, is essentially a co-operative art, and, indeed, I believe the art of architecture itself is very much more a co-operative art than many people seem to think. It is more and more necessary to bring to bear upon even our individual buildings types of skill and ability seldom all united in one man, and our offices are really much in the nature of guilds turning out work which is the result of a high degree of co-operation between the principal and the assistants working with him. In the same manner, fine city building can only result from a high degree of co-operation between all the architects working on the individual buildings. Something may be done on limited areas and on private estates, as at Bedford Park or Hampstead, for example, to produce unity of effect by bringing all the buildings under the controlling influence of the ideas of one man, whose attention is centred on the whole effect, rather than on the individual buildings; but these are, after all, makeshift methods. Art is not a thing easily to be controlled, and unity of effect in a whole town can only be expected when the whole of its architects are joined together by some common aim, some common appreciation of the whole effect which is being worked up to. This may seem much to expect from the present chaotic and individualistic condition of the architectural profession; but I cannot help hoping that the opportunities afforded almost for the first time in this country by the Town Planning Act, enabling us to consider as a whole, and to guide and to control the development of our towns along definite and well thought out lines planned with the due consideration for architectural effect, will so stimulate in all of us an enthusiasm for the beauty of the whole, that it will become as natural to think first of the whole, and to see our buildings in the true perspective as parts of a great street picture, as it has been natural under the conditions which have held sway in this country for so many years, for our attention to be concentrated exclusively on our own work. This is the right, the ideal form of compulsion, the compulsion exercised upon each one of us by our zeal for some ideal which shall be shared by the whole guild of architects. We should do all that is possible in our own practice, and in the education of those who are coming forward to help us and take our places in due course, to foster this spirit, because it is only by the development of this compulsion from within that we shall be able to justify ourselves in resisting some form of compulsion from without.

HOUSE AT GERRARD'S CROSS.

This house has been recently built at Gerrard's Cross, Bucks., for T. D. McMeekin, Esq., on an elevated site overlooking the River Colne. The external walls are whitewashed and the roof thatched with Norfolk reeds, by Mr. Farman, of Walsal, Norfolk. The half-timber work is oak, left rough from the saw and with pins projecting. A feature is made of the hall, which is oak panelled to the walls, with a large ingle fireplace, built in Dutch bricks, and old pieces of stone. Heavy oak beams form the ceiling of the dining room, and the two rooms are designed to form one large room when the doors are opened. The staircase is octagonal, and constructed in oak and Oregon pine, the casement windows forming a frieze with rough tile panels at ends, immediately under a domed ceiling. The architect was Mr. A. Jessop Hardwick, F.R.I.B.A., of Eagle Chambers, Kingston-on-Thames, and the contractor Mr. J. Bailey, of Gerrard's Cross. All iron casements and leaded lights are by Messrs. Humphries, Jackson, and Ambler, of London, and the door furniture by Messrs. Hope and Co., whilst the rain-water heads are by the Bromsgrove Guild.



: GROUND FLOOR PLAN :

: FIRST FLOOR PLAN :

HOUSE NEAR GERRARD'S CROSS, BUCKS. A. JESSOP HARDWICK, F.R.I.B.A., ARCHITECT.

Legal Notes.

Builders and contractors who have to move large quantities of stone and other heavy materials about the country in order to fulfil large contracts, are sometimes accused of causing damage to the roads. The highway authority may recover the cost of making good the damage caused by "extraordinary traffic." Formerly, the person "by" whose order the traffic was led was the person responsible; since 1898, however, the person "by or in consequence of whose order" the damage was caused, may be made party to the action. But what is "extraordinary traffic"? The courts have decided that, in solving the question, regard must be had to the normal traffic of the district. A recent case (which is reported in the November "Law Reports") makes it plain that the nature of the road in question is to be regarded. In that case, the defendants bought standing timber from Lord Penrhyn, which they cut down and led away. Their defence was that timber growing was a recognised industry in the district. It was pointed out, however, that the road in question was a narrow road, generally used only for agricultural traffic, and had steep gradients. Taking this into account, a county court judge held that the traffic was extraordinary so far as the particular road was concerned, and found against the contractors, and his decision was upheld by the Court of Appeal. Builders and others should be careful to select a road which will bear heavy traffic.

Expert Witnesses.

Architects and surveyors often appear in court as expert witnesses. If the expert knows nothing of the party who desires him to give evidence, he will be well advised to demand payment of his fees before he consents to go to court at all. As a general rule, of course, if the party who calls him wins the case, the witness's fees are included in the costs paid by the other side; and sometimes the costs of his attendance to inspect and view the property are also included. In a case which was reported in the November "Law Reports," the question was whether a "qualifying fee" was payable to a geologist. He had been subpœnaed to give evidence as to whether kaolin was a mineral or not, and had visited Cornwall in order to make investigations. Mr. Justice Eve said: "Although I am not for a moment saying it is necessary that every scientific witness called in a case of this sort should view the *locus in quo*, I am perfectly certain the experience of most of us is that a scientific witness, however eminent, is far more useful to those conducting the case if in fact he has had the advantage of viewing the *locus in quo*. . . Here he had had to make a careful examination of the strata." In the event the fee was allowed. Architects and other experts should remember that their qualifying fee may be allowed, and should not therefore hestitate to emphasise the importance of seeing what they are going to give evidence about.

Children and the Law of Negligence.

Every builder and builder's foreman has had trouble with trespassers on the job Sometimes an attempt is made to keep them away by an announcement that "Trespassers will be prosecuted," or that there is "No admittance except on business." Of course, in the case of an adult, he trespasses at his peril. If a brick were to fall on his head, neither the builder nor the building owner would be liable, unless, of course, the act was deliberate, when it might come under the head of an assault. Possible danger, therefore, may act as a deterrent for adults; but this does not protect the builder from infant trespassers. Nor does an infant trespass at his own peril. In a recent case some boys trespassed on the property of a railway company and played with a turntable. In the result one of them was injured. The House of Lords held that the railway company was liable on the ground that a machine of the kind which would attract children must be properly guarded. So if a builder were to leave a crane unguarded, and a child was to be injured by playing with it, the builder would probably be held liable. It is therefore important for children to be kept away from the works at all costs.

Law Cases.

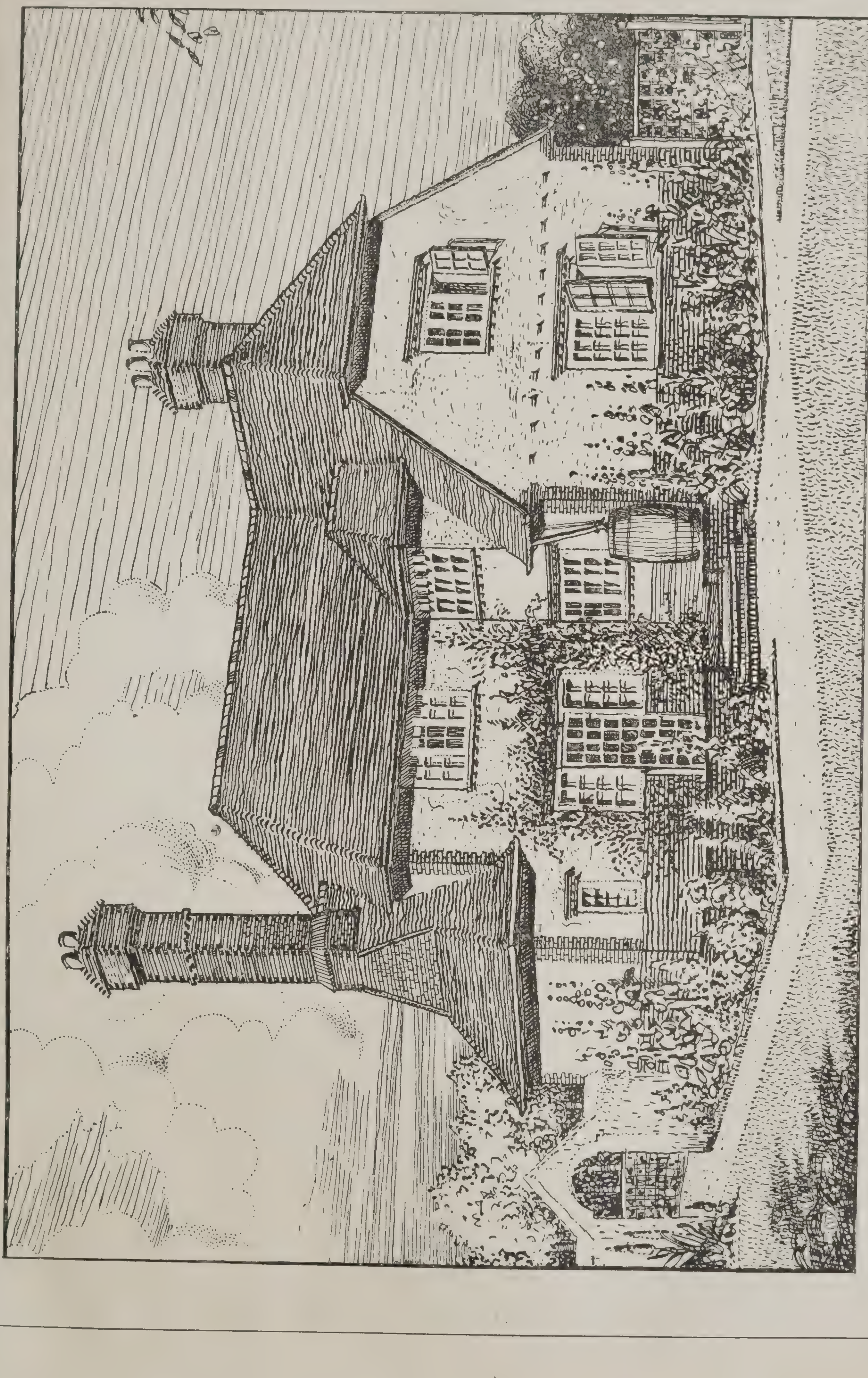
The Composition of Mortar.

At the Portsmouth Borough Police Court, a group of fourteen builders were arraigned upon a charge of contravening a local bylaw as to the composition of the mortar that had been used during the previous June on houses which they had had in course of erection at that time, and the case excited great interest throughout the building trade of the town, the Court being packed by those in the trade who desired to hear the arguments. The by-law in question is by-law 13, which was made on the 12th April, 1904, and which requires the mortar in use to be compounded of "white chalk lime and clean sharp sand or other suitable material in the proportion (by measure) of one part of lime and not more than three parts of sand, or other suitable material; or (b) of good cement; or (c) or of cement mixed with clean sharp sand in the proportion (by measure) of one part good cement, and not more than four parts of clean sharp sand." It was alleged that mortar had been used which did not comply with the requirements of this by-law. The first summons taken was that against William Richard Tanner, in respect of houses in Comeragh Road, Milton. Mr. S. H. Emanuel, LL.D., barrister (instructed by Messrs. Hobbs and Brutton) defended, and Mr. Sparkes, the deputy Town Clerk, prosecuted. Mr. Sparkes said that in this case a sample was taken by a building inspector on the 15th June in the presence of the defendant, and when it came to be analysed, it turned out to be made up of one part lime to 16.3 of sharp sand. Certain formal points having been admitted on the part of the defendant, John Henry Charles Gosling, a building inspector in the employ of the Corporation, spoke to the taking of a sample of the mortar in use on the buildings in question on the 16th of June last. Mr. F. W. F. Arnaud, the borough analyst, gave evidence as to the result of his analysis of the sample taken from the defendant's buildings. He said the result of his analysis was that he found the mortar contained 81.37 of sand and grit, in weight; it contained 12.53 of earthy matter which was not combustible, and .71 of earthy matter which was combustible; the amount of pure lime in the sample was 1.61 per cent. in weight. The conclusion that he arrived at from that analysis was that there was an excessive quantity of earthy matter and that the lime was deficient because calculating that in volume there was not more than one part of good lime to 19.5 of other materials. A Magistrate: What is the proportion of lime to sand and grit?—The proportion of lime to sand and grit, that is, including all earthy matters, is not more than one part of lime to 16.3. Mr. Emanuel then submitted a point of law to the effect that the by-law under which this information had been laid (by-law 13) dealt only with the mortar which had been used in external or enclosing walls. It had nothing whatever to do with the mortar used in party walls, or in inner walls that divided rooms, and therefore mortar of the composition mentioned in this by-law, though wanted for the outside walls, was not wanted for the inner walls that did not enclose the building, and there had been no evidence given that any of it had been used on any enclosing wall, and for all they knew it might all have been used on the inner walls. Therefore, he submitted the information must fail. —The Bench having considered the point raised, the Chairman announced that whilst they were not altogether prepared to agree with Mr. Emanuel's point of law, they were of opinion that in this case, as to the application of the mortar in question, there had not been sufficient evidence, and therefore the case would be dismissed.

The next case taken was that of William T. Bayley, in respect of the mortar alleged to have been used in two houses he was building in Liss Road.—Mr. Gosling, building inspector, said he saw defendant's men using the mortar on party walls, cross walls, division walls, and external walls.—In reply to a cross-examination, he said that since the occurrences which led up to this case, the instructions were to take samples of mortar from between the bricks, and not from the heaps, and the process was as under the Food and Drugs Act, leaving one with the builder that he might have an analysis made in his own defence.—Mr. Murch, the borough surveyor, said proper material for use with lime in mortar was clean, sharp sand; other suitable materials were hard, well-burnt brick, thoroughly ground, or good clinker which came from a destructor; this was very hard when burnt.—Col. Owen: Would it pay to use brick?—It would not pay in small buildings.—Mr. Arnaud gave evidence as to the analysis of the sample, which, he said, contained 80.13 per cent. of sand and grit, 8.22 of incombustible earthy matter, and .77 of combustible earthy matter, making the total earthy matter 8.99, the pure lime being 2.55 per cent. in weight. The lime present was not more than 1 per cent. to 12.1 of other materials. In this case there was an excess of earthy matter, and it was deficient in lime. He was emphatic that his method of dealing with the sample was perfectly fair, but he concurred with expressions of opinion by Mr. W. C. Ball and Mr. Vernon Inkpen, the former suggesting that three samples of 2lb. each, and the latter a half-shovelful should be taken.—Mr. Emanuel, for the defence, submitted that there had been no identification of the sample, and that no case had been made out.—Defendant said he had built hundreds of houses. He used the mortar mixed in the proportions of three to one. The mortar used for inside work was kept separate from that used for the outside work.—In this case, too, the Bench expressed themselves as not being satisfied that the mortar was used on the enclosing walls, and the information was therefore dismissed.—Mr. Emanuel said that he should take the same course in the other cases, but the Bench suggested that they should be adjourned *sine die*.—After some discussion, Mr. Sparkes intimated that the other cases would be withdrawn.—Mr. Emanuel commented on the fact that the method of taking the samples had been altered.

The New General Post Office Buildings.

At the Consistory Court of London, before Dr. Tristram, K.C., Chancellor of the Diocese, sitting in St. Paul's Cathedral, an application by the vicar and the churchwardens of Christ Church, Newgate Street, for the court's approval and ratification of an agreement come to between them and the Postmaster-General in respect of compensation for interference with certain easements of light and air consequent upon the erection of the new Post Office buildings, was heard. —The petition stated that the Postmaster-General has acquired the fee simple of certain land and premises forming part of the site of Christ's Hospital immediately contiguous to Christ Church, Newgate Street, and by the Post Office Sites Act, 1907, he is empowered to erect buildings there. All public and private rights and easements in, over, or relating to the Post Office site are extinguished, but the Act provided that any person might recover from the Postmaster-General such compensation as he might be entitled to under the Lands Clauses Act for any private rights or property of which he might have been deprived. The new building erected by the Post Office was in closer proximity to the church than the buildings which formerly stood there, and they were at a much greater height. A claim for compensation had been made for this interference with the church's easements of light and air. Under the advice of competent architects and surveyors, an agreement had been en-



THE WHITE COTTAGE. J. ALGERNON HALLAM, ARCHITECT.

The above is a sketch for a small cottage, the walls to be covered with rough plaster, the roof with hand-made tiles. When built the first floor will be carried up straight over the living room ingle, this will give space for a fourth room on the bedroom floor, the present large bedroom being made a little smaller. The chimneys are to be constructed of small bricks unpointed.

tered into between the vicar and churchwardens and the Postmaster-General for the settlement of such claim by payment of £1,000, and the Court was now desired to approve and ratify that agreement and to direct the payment of such compensation to the Ecclesiastical Commissioners in order that by its investment the income might accrue for the benefit of the incumbent for the time being. In reply to the Chancellor, Mr. Charles said the sum granted for compensation—£1,000—had been fixed after consultation between Sir Henry Tanner, representing the Post Office, and Mr. Blomfield Jackson, representing the parish. Mr. Opie Smith, on the part of the Post Office, concurred in the petition. The Chancellor said he should make the order as prayed.

Apprenticeship Agreements.

A case of much trade interest came before the Stipendiary Magistrate (Mr. E. M. E. Welby) at the Sheffield Police Court, on Friday last, and occupied the attention of the Court for nearly four hours. The matter had been adjourned on several occasions, owing to the illness of the Stipendiary. The plaintiff was a member of the Sheffield Association (Mr. A. J. Belton), who sought to enforce an apprenticeship agreement entered into with an apprentice named Harold Gosling. Mr. P. Richardson appeared for the plaintiff, and Mr. Arthur Neal defended.—Mr. Richardson said that the boy, who was 16 years of age in November, 1906, became apprenticed to Mr. Belton in June, 1906. Mr. Belton had occasion to remonstrate with him, and to encourage him to give better attention to his work, Mr. Belton increased the lad's wages, so that the lad was receiving altogether 3s. per week more than the agreement stipulated. Mr. Belton, however, was put to much inconvenience by the lad's indifference to his employer's interests. On September 1st this year matters had reached such a pass that Mr. Belton consulted his solicitor, who wrote to the lad's mother to the effect that, although his client was loath to proceed to extreme measures, he would now require the lad to return to work at the wages stipulated by the apprenticeship agreement. As a result, the lad promised to obey if Mr. Belton would still continue the extra money, and this Mr. Belton consented to do. Subsequently Mr. Belton felt it his duty to bring the matter before the Court as a point of principle. On October 1st, the lad left his work absolutely, and had entered the service of another employer. Plaintiff now asked that the lad be ordered to go back and do his duty according to the apprenticeship indenture. Mr. Belton gave evidence in support of the statements of his solicitor.

Four men in the employment of plaintiffs deposed that the lad had been persistently negligent, and had on occasions absented himself as much as four or five hours at a stretch.—The lad Gosling stated in evidence that at first he had received instruction from a man who had been apprenticed with Mr. Belton, but when he left there was no one to teach him. Cross-examined by Mr. Richardson, he would not deny that Mr. Belton had complained personally and by letter, but he had never done work wrong intentionally. Since he left plaintiff, he had been in temporary employ at 5d. per hour, and made perhaps 5s. per week more than he was getting with plaintiff.

The Stipendiary, in delivering judgment, said that this was a case which contained some highly important points, and they had very properly been brought to the notice of the Court. There had been a complaint that the apprentice did not receive sufficient personal superintendence. That was necessary at the outset, but it could not be held that after three years an apprentice was incapable of working to instructions and designs, even if he had not done exactly the same work before. He therefore thought that the complaint about personal superintendence was rather overdrawn. As to the apprentice being taught, cases had come under his notice where it was evidently intended that the master should personally be the teacher. The plaintiff's trade seemed to divide itself into two branches—the shop, and buildings, or outside work. On the former, it did appear that there was some ground of complaint, that there was not a sufficient amount of competent superintendence. So far as the outside work was concerned, it was not disputed that a competent joiner was in charge. But, at any rate, if there was slackness in the teaching, it was for the apprentice to complain to the master that he was not fulfilling his engagement under the apprenticeship deed, in the same way as in the present case the master complained that the apprentice did not fulfil his part of the engagement; and he was bound to come to the conclusion that the apprentice had not done so, and must be ordered to fulfil his duties, because the complaint was that the apprentice worked uncertainly at times, and it was quite evident that he could work properly and industriously, instead of which he had taken two hours over a job requiring only twenty minutes. He was afraid he had got out of liking for his master, like so many apprentices when the time comes that they begin to feel that they can do better out of their apprenticeship, and become slack, with the object of getting the apprenticeship indenture thrown up. What the apprentice had to do was to place himself into a position in which there was no complaint against him, and then if he had a valid complaint against his master of slackness in teaching what he has to be taught, the master must be ordered by the Court to put that right. Under all the circumstances, there must be an order that the apprentice go back and fulfil his duties as a proper apprentice under his apprenticeship agreement.—The plaintiff asked for costs, not necessarily to be enforced, but Mr. Neal, on behalf of defendant, held that it was unusual to award costs against an apprentice, and the Court refused to make an order.

ENGINEERS v. PLUMBERS.

Board of Trade Arbitrator's Award.

The decision of Alderman T. Smith, J.P., the arbitrator appointed by the Board of Trade to determine the question of dispute between the parties has now been issued, and is as follows:—

"I decide that no claim has been established giving to plumbers the exclusive right to fit and fix all pipes and fittings in hard metals used in connection with ventilation, heating, warming, laundry, cooking, and general hot and cold water domestic (or other) supplies or services. I therefore award and determine that, in the water area of the Leicester Corporation, the demarcation of work shall be as follows:—

> (a) "All lead work in connection with hot and cold water domestic (or other) supplies or services, shall be plumbers' work. All domestic waste, soil, or ventilating pipes above ground, from w.c.'s, baths, lavatories, sinks or other sanitary conveniences or appliances, shall be plumbers' work.
>
> (b) "All other work in connection with ventilation, heating, warming, laundry, cooking and general hot and cold water domestic (or other) supplies or services, in which iron, brass, copper, or other similar hard metal is used, may be done either by hot water heating and ventilating engineers, fitters, or by plumbers, as may be provided in plans or schemes prepared by hot water, heating and ventilating engineers, or by master plumbers, or others."

This vindicates the right of the heating and domestic engineers to do the work in question and establishes what they have maintained all along, viz.:—"That all lead work be considered plumbers' work, but that a neutral line be taken as regards all iron, brass, copper or other metal work, which may be executed by engineers or plumbers." The plumbers' contention that, irrespective of the metal used, the work is theirs and theirs alone to the exclusion of any other trade, is thus set aside and disposed of.

NATIONAL LABOUR EXCHANGES AND THE BUILDING TRADES.

(*Communicated.*)

There is probably no industry to which the Labour Exchanges Act, 1909, of more importance than to the building trades, and at the moment when the Board of Trade is preparing the necessary organisation, it will be of interest to consider the workings of the Exchanges as they affect these trades.

As showing the intimate relations likely to exist between the Exchanges and these trades, it may be mentioned that out of 9,642 applicants who came under the notice of the central unemployed body for London during a given period, no less than 1,661, or over 17 per cent. came from the building trades.

As to the Exchanges in general, the country has been divided into ten great districts, varying in size according to population and industrial nature. Each district will have a central office and a divisional superintendent, under whose control will be a number of Exchanges. Each Exchange will work primarily in its own area, and report to its divisional officer. The divisional offices being in constant touch with one another and with the headquarters at the Board of Trade in London, it will be seen that a worker may hope to ascertain promptly and definitely what labour is in demand, not only in his own area, but all over the country, instead of, as at present, being limited to those jobs which he can actually visit, with the addition, perhaps, of a little information passed on to him by his friends.

The Exchanges are to be of three classes, according to the requirements of the various towns and districts, supplemented by a system of sub-offices—practically only waiting-rooms—at prominent resorts of casual labour, such as the docks in London and Liverpool.

The advantages of such Exchanges may be summarised as follows: For casual labour, to "de-casualise" the nature and incidence of such work; and for the skilled worker, to avoid, or at least to shorten, the trying, dangerous, and demoralising breaks between spells of work, by bringing the man and his work together with the least possible delay.

Obviously, a completely successful Exchange will be one in a locality where every worker looks to the Exchange as his source of information, and every employer goes or sends there for his labour; and the first question that arises is: To what extent are both sides going to use the Exchanges? As regards the men, there is little reason to anticipate any reluctance, as a man out of work is generally ready to give at least a trial to anything having any claims at all to be a means of finding him work. Men in the building trades, at any rate, have only been deterred from using such Exchanges as at present exist by the suggestion of "relief" or "distress," which clings to them by reason of their origin, they having been inaugurated by the Central Unemployed Body for London. That body are entitled to every praise for what they have achieved in the face of all the difficulties and handicaps which they have had to encounter, but the fact remains that most building trade operatives avoid such Exchanges as long as they can, from their objection to being associated with distress measures. As a matter of fact, the present Labour Exchanges are completely separate, in organisation, from the relief works of the central body.

All in the building trades know that, in questions of engaging labour, the term "employer" means in effect, the general foreman or else the various trades foremen. Their present system (the average seeker after work would probably smile at the use of the term "system" in such a connection) may be briefly described as taking on at the gate. Now, whilst this is a fairly easy method for the foreman, especially during the slackness prevailing in the trade during the past year or two, when he wants men, it causes him endless trouble when he does not. Moreover, the Exchanges will give him a much wider field of selection, as he can choose from every man available at the moment in his entire area, or even, as already described, from the entire country if he likes, whilst now he can only choose from those whom chance has brought to his own particular gate at that particular moment. Most foremen attach considerable importance, and naturally so, to having, if possible, men who have worked for them before this personal connection can be perfectly well preserved under the new conditions, as, it being known in what area any individual man will have registered if seeking work, it will be a matter of a very few minutes to ascertain (telephones will play a very important part in the work of these Exchanges) definitely whether or not that man is available.

Turning again to the case of the men, it is to be hoped the various trade societies will look with favour upon the advent of the Exchanges. Certainly they should do so, as one of the first effects will be to save a considerable portion of the trades unions' expenditure on "out-of-work" pay. The vacant books of the various societies do in a small way at present, of course, the work of Labour Exchanges, but only to a very limited extent, and it should be one of the first thoughts of those concerned to extend the usefulness of these books by handing over that portion of their work to the Labour Exchanges.

Another most important point is the action of the Exchanges in case of labour disputes. This will, no doubt, not be left to the discretion of individual superintendents of Exchanges to determine, but will be covered by the regulations drawn up by the Board of Trade. There is much to be said for the policy of the present Exchanges in suspending all action in such cases, but it must be admitted that this policy amounts to some extent to taking sides against the employer, an objection which will apply more and more as the Exchanges become more fully developed, because to just such extent as the employer comes to look upon the Exchanges as his only source of supply for labour, precisely the attitude, be it noted, which he is asked to adopt, to just that extent will the policy mentioned amount to cutting off his supply. This action would amount to a grievous hardship where he was not at fault in the dispute. Such action could then hardly be defended as the attitude of neutrality which an employer has a right to expect in a national organisation. On the other hand, to ignore the dispute and to continue to notify the vacancies as if such dispute did not exist would be to take sides against the men. It is probable that the soundest policy in these cases will be found, as in so many others, in a compromise, by which the vacancies are notified, but accompanied by an intimation of the state of affairs causing the vacancy, as is at present done in Berlin and in most of the German cities.

The great consideration amongst the building trades, as indeed in all others, should be that here is the first really scientific attempt to deal with unemployment.

Mr. John Allen, of Gloucester, who has died in that city at the age of seventy-two, was formerly a partner in the firm of Moffatt and Allen, timber merchants.

* * *

Mr. James Ebenezer Saunders, of Chelviston, Eltham Road, Lee, architect and surveyor, formerly deputy-alderman and afterwards Alderman of the Ward of Coleman Street, some time a member of the Metropolitan Board of Works, and of the London School Board, one of the oldest members of the City Lieutenancy, to which he was appointed in 1876, a member of the Geological, Royal Astronomical, and Zoological Societies, and of the Fishmongers', Blacksmiths', Painters', Curriers', Needlemakers', and Wheelwrights' Companies, who died on November 24th, aged 79, left estate of the gross value of £8,983, with net personality £5,767.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION
Dec. 18.	TRAINING COLLEGE FOR TEACHERS, Kirkstall Grange, Far Headingly, Leeds. Architects practising in Leeds are invited to submit competitive designs for the above College. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed Assessor. Copies of the conditions of competition and instructions, a plan of each floor of the educational blocks and of the hostel blocks, also an estate plan, showing a suggestion for grouping the various buildings, may be obtained from James Graham, Secretary for Education, Education Department, Leeds. Designs to be delivered not later than 12 o'clock noon. Deposit: £2 2s.
Dec. 31.	SOUTHEND-ON-SEA. NEW COUNCIL SCHOOL. Limited to Architects practising in the Borough. Conditions of competition and plan of site on application to J. W. Barrow, Clerk to the Education Committee, Education Offices, Municipal Buildings, Southend-on-Sea.
1910. Jan 1.	LARNE. TECHNICAL SCHOOL IN VICTORIA STREET. For the Larne Technical Instruction Committee. Total cost, including fixtures and enclosing of ground, not to exceed £3,600. Premium, £21, merged. Successful competitor will receive commission of 5 per cent. for supervision, including plans, specifications, estimates, and *Bills of Quantities*. Particulars of Thomas Clearkkin, Secretary, Technical In-Instruction Committee, Larne.
Jan. 1— Mar. 1.	NEW BUSINESS PREMISES, LEEDS.—The Directors of the Leeds Industrial Co-operative Society (Ltd.) invite competitive drawings and estimates for new Business Premises and Offices, to be erected on the site of the old "Mercury" Office, Albion Street, Leeds. Premiums of £100, £50, and £25, respectively are offered, and will be awarded to the authors of the designs and plans placed first, second, and third by the Assessor. Conditions of competition, and lithographed plans and other particulars, will be forwarded on application to the Secretary, on or before Jan. 1, 1910, on receipt of stamped addressed foolscap envelope, accompanied with a deposit of £2 2s. Competitive designs and plans to be sent in to the Secretary, John W. Fawcett, Leeds Industrial Co-operative Society (Ltd.), 10, Albion Street, Leeds, not later than March 1, 1910. To the architect deciding not to compete, and returning all documents within seven days, the deposit will be returned.
Jan. 15.	ELEMENTARY SCHOOL, KEIGHLEY.—The Education Committee invite competitive designs and estimates for a new Public Elementary School for older children to be erected at Highfield, Keighley. Printed instructions and conditions, with a lithographed plan of the site, may be obtained on application at the Education Offices. Designs and estimates to be sent by Jan. 15 to H. Midgley, Secretary, Education Offices, Keighley. Only architects residing or carrying on business within the Borough are invited to compete.
Jan. 31.	NATIONAL MUSEUM OF WALES. The Council desires to receive competitive designs for the erection of a new National Museum at Cardiff, Three premiums are offered of £200, £150, and £100, for second, third, and fourth. The Council have appointed Sir Aston Webb, R.A., Mr. John J. Burnet A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A., as Assessors. Particulars and plans of the site will be supplied to competitors on payment of a fee of £2 2s., returnable if all papers are returned within 14 days. Inquiries to be addressed to Dr. Wm. Evans, Hoyle, Director of the Museums. City Hall, Cardiff.
Feb. 1.	OLDHAM, EXTENSION OF THE TOWN HALL. Restricted to Architects practising or residing in the Borough. Premiums of £50, £30 and £20, for the three designs placed 1st, 2nd and 3rd, and a sum of £5 will be paid to all unsuccessful competitors who send in a complete set of plans in accordance with the instructions. Plan of site, with instructions and suggestions for architects obtainable from E. C. Foote, Borough Surveyor, Town Hall, Oldham. Deposit: 21s.
Mar. 1.	GLAZED BRICKWORK DESIGNS AND ESSAYS. A committee of glazed brick manufacturers invite designs for works to be executed in glazed brickwork, also essays as to the advantages to be derived from the use of this material in accordance with conditions to be obtained from J. Johnston Green, 142, Liverpool Road South, Southport. Premiums of 100 guineas, 50 guineas and 25 guineas awarded to designs and essays jointly. Assessor Mr. Max Clarke, F.R.I.B.A., appointed by the President, R.I.B.A.
No Date.	CRADLEY HEATH. The trustees of the United Methodist Church invite Architects to submit designs on approval for Sunday School with seating accommodation for about 1,000. For particulars, Mr. C. Clee, Cradley Heath, Staffs.

Correspondence.

[The Editor declines responsibility for the statements made or opinions expressed by correspondents.]

Builders' Locked-up Capital.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Your correspondent "A. G. W." is within the mark when he says that some architects have to be worried into settling accounts.

But why this appalling apathy of builders? There is no other industry carried on by these happy-go-lucky methods. Yet builders attempt the impossible. No wonder there are so many left by the wayside, financial cripples.

Any builder of lengthy experience can give you many instances of honest hard-working men who have had their lives made almost unbearable and sadly shortened by this custom of holding up balances. Several recent instances have come to my knowledge.

1. A builder put up a public hall for a religious body five years ago. He has a balance of some £400 outstanding.

2. Hospital built by public authority. Extras of upwards of £600 ignored by architect in his final certificate. The issue of legal process backed by the builders' Federation has, I understand, now succeeded in getting a settlement of this case.

3. A religious body erected premises and occupied them twelve years ago. The builders time after time sought a settlement. After extraordinary pressure, and heaven knows how much mental wear and tear, the builders obtained some £3,000 outstanding, nine years after due date!

4. A large mill occupied over two years. Builder is waiting for his balance of £2,000.

Your correspondents complain of many cases. Similar ones are of common knowledge. What remedy is to be applied to gather in these dead balances?

First, the insistence on an arbitration clause in all contracts as in the form agreed upon between the National Federation and R.I.B.A.

Secondly, the insertion in that agreement of a date after which the ascertained balance due the builder carries interest.

The building owners would then be anxious for a speedy settlement, instead of holding the architect back from settling up, as in many known instances.

The evil is so widespread that I am afraid a good many builders think it is only a natural state of things, and despair of its ever altering. The only people that will force an alteration are the builders themselves.

If the builders' Federation is going to justify its existence, it is by finding a solution to such questions as this.

A LANCASHIRE BUILDER.

Mr. Chas. T. Overmann, 21, Spring Gardens, Manchester, informs us that in addition to representing Messrs. H. Hope and Sons, Ltd., of Birmingahm, for casements, patent glazing, etc., he has been appointed sole agent for Messrs. Gibbs and Canning, Ltd., terra cotta manufacturers, of Tamworth

Trade and Craft.

Eternit Tiles; Keltic Pattern.

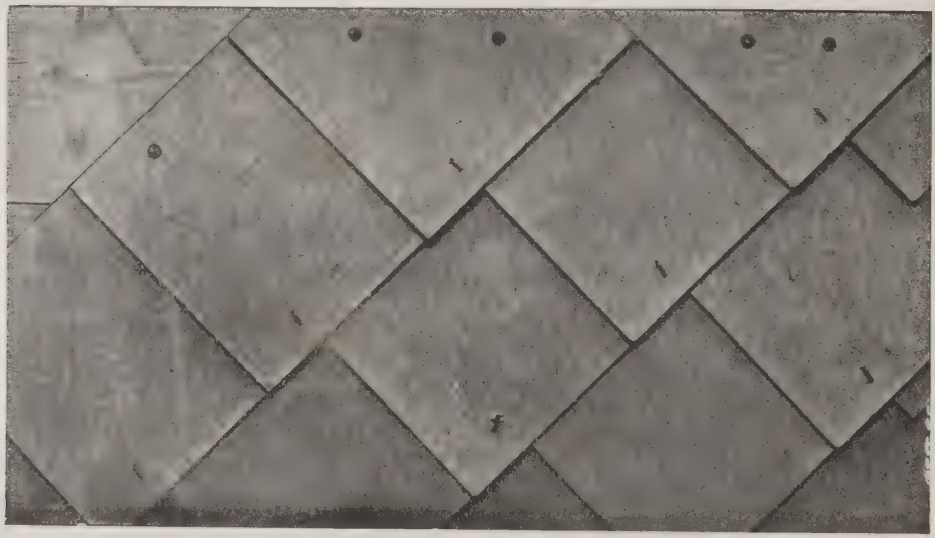
The Eternit tiles, which are accepted by all fire assurance companies as being fire-resisting and incombustible, are made of a material that is also of the highest value as a non-conductor of heat and cold. The tiles are non-absorbent, weather-tight, and damp-resisting, the perfectly smooth faces permitting of their being laid diagonally and with close joints. While very light in weight, they are extremely tough and strong, so that the risk of breakage in handling and in transit is nearly nil, while the tensile strength is 5,781lb. per square inch, and the crushing force 8,281lb. per square inch. Yet the weight of an Eternit roof is only about 21lb. per square yard, allowing for 2¾in. lap. The tiles are stocked in three colours—grey, blue, and terra-cotta—and they may be fixed in either of three patterns, denoted as "C," "F" (or honeycomb), and Keltic. An illustration of the Keltic pattern is here shown. This pattern of eternit tile is well suited for fixing on steel-framed roofs, great economy resulting from the fact that the steel laths are spaced at 13in. centres for 15¾in. by 15¾in. tiles at 2¾in. lap, as in the case of Roman roof tiles. The æsthetic effect of this arrangement of tiles is, we think, distinctly pleasing. Full details may be obtained from G. R. Speaker and Co., contractors to H.M. Government, 29, Mincing Lane, London, E.C.

The Invisible Slate Clip.

We have received for notice samples of a new slate clip called "The Invisible," and justifying the name. The clip is exceedingly simple in construction, comprising two pieces—namely, a steel eylet and a steel toothed spring, an ordinary nail serving as a wedge. The average roof repairer uses lead, copper, or zinc clips, and sometimes copper wire, all of which are visible and are very liable to get out of position through the action of the sun and snow, with the result that the roof again requires attention. This clip is subject to none of these disadvantages, and can be used for any size slate, but it cannot be used for tiles. It commends itself to architects, because it enables the repair of broken slates without rendering the roof unsightly, and it effectually prevents slates from slipping out of position. Full particulars and illustrations showing the method of fixing may be obtained from Kerner-Greenwood and Co., King's Lynn.

W. Gradwell and Co., Ltd.

Messrs. W. Gradwell and Co., Ltd., of Barrow-in-Furness, have just completed the following contracts: Timber piled dolphins at the Egremont Ferry in the river Mersey; driving 196 iron piles at Fleetwood for the Fleetwood Victoria Pier Co., Ltd. They also have the following contracts in hand: Timber piled groyne and concrete work at Workington for the Workington Iron and Steel Co., Ltd. Timber piling on the river Eden for the Workington Iron and Steel Company, Ltd. Concrete piling at the Fish Dock, Fleetwood, for the Lancashire and Yorkshire Railway Company. Pile-driving foundations and submarine concrete work at the Lighter Shed, Cavendish Dock, Barrow-in-Furness, for Messrs. Vickers, Sons and Maxim, Ltd.



ETERNIT TILES LAID IN KELTIC PATTERN.

Coming Events.

Wednesday, December 15.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. Andrew Muir on "Mediæval Stone Carving," 8 p.m.

EDINBURGH COLLEGE OF ART.—Professor A. D. F. Hamlin (Columbia University, N.Y., U.S.A.), on "Architecture in America," 8 p.m.

Thursday, December 16.

Annual Meeting of First Garden City, Ltd., Inns of Court Hotel, High Holborn, W.C., 3.30 p.m.

Friday, December 17.

EDINBURGH COLLEGE OF ART.—Professor A. D. F. Hamlin (Columbia University, N.Y., U.S.A.), on "Architectural Education in America," 8 p.m.

INSTITUTION OF MECHANICAL ENGINEERS.—Mr. William Mason on "Mild-steel Tubes in Compression and under Combined Stress," and Mr. C. A. M. Smith on "Compound Stress Experiments," 8 p.m.

INSTITUTION OF CIVIL ENGINEERS.—Students' Meeting. Mr. H. T. Tudsbery on "The Foundation and Construction of Dock Walls," 8 p.m.

Saturday, December 18.

INSTITUTION OF CIVIL ENGINEERS.—Students' visit to the printing works of Messrs. Edward Lloyd, Ltd., Salisbury Square, E.C., 8.30 p.m.

Monday, December 20.

LANCASHIRE, CHESHIRE AND NORTH WALES BUILDING TRADES' EMPLOYERS' FEDERATION.—Half-yearly meeting at Liverpool.

Tuesday, December 21.

ANCIENT ARCHITECTURE LECTURES AT THE BRITISH MUSEUM.—Mr. Banister Fletcher's 12th paper. Seventh and concluding lecture on "Greek Architecture." End of Michaelmas term. 4.30 p.m.

In our notice of the Kodak Company's new buildings, at Wealdstone, in last week's issue, it should have been mentioned that the building is fitted with a number of the "Dreadnought" fireproof doors, supplied by Fireproof Doors, Ltd., 46, King William Street, London, E.C.

* * *

The Sheffield Building Trades Exchange and Club, of which the president is Mr. A. J. Forsdike, and the secretary, Mr. Thos. Smith, appears to be an exceedingly flourishing institution, which pays special attention to the social side of organisation. The neatly produced programme for the current session comprises not only a long list of such entertainments as billiard tournaments, whist drives, lectures, smoking concerts, and cinematograph exhibitions, but also an annual children's party on New Year's Day. One could hardly imagine a more effectual means of promoting sociability and of retaining and stimulating interest in the more prosaic objects for which the members are banded together.

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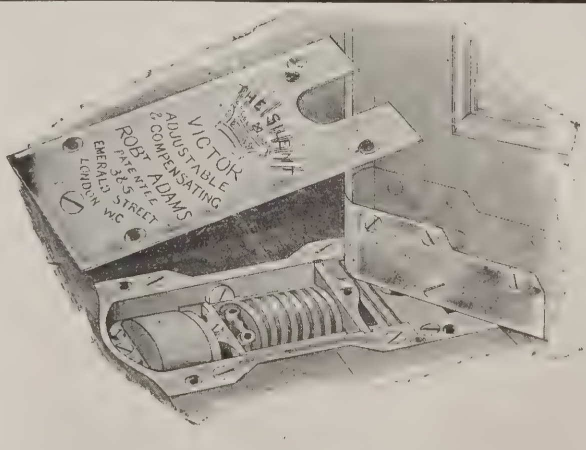

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MONTHLY OFFICIAL REPORTS.

THE NATIONAL FEDERATION.

Meeting of Executive Council and Annual General Meeting.

The Executive Council and annual general meetings have been fixed for January 25th and 26th, 1910. Matters for the agenda of these meetings should reach the National secretary not later than December 31st next.

Conditions under which Tenders are Required to be Sent in.

A similar conference to that reported in the last month's report as having been arranged with the R.I.B.A., has been arranged with the Institute of Civil Engineers for to-day.

Departmental Committee on Railway Agreements.

Mr. J. G. Robertson, of S. Shields, gave evidence before the above committee on the 8th inst. with reference to complaints of inadequate facilities for handling luggage and goods, undue delays of goods in transit and unreasonable claims for demurrage, etc., etc., occurring in the district of S. Shields.

The Comparative Statement of Wages and Hours of Labour.

Is republished in this issue with such corrections as have come to hand.

Secretarial Changes.

Mr. Costigan has retired from the secretaryship of the Southern Counties Federation, and is succeeded by Mr. F. Wolley, of 5, Portland Street, Southampton.

Mr. Bigwood has retired from the secretaryship of the Birmingham Association, and is succeeded by Mr. G. H. Wright, 22, Winchester House, Victoria Square, Birmingham.

The Only Way.

In adopting a new set of rules and generally re-organising, the Nottingham Association have adopted the following: "The official journal of the Federation will be supplied by the Association each week, free of cost, to all ordinary members whose subscription is paid for the current year."

This is the only way to make an official journal truly justify its title, and should be generally imitated.—A. G. White, Secretary.

LANCASHIRE, CHESHIRE, AND NORTH WALES FEDERATION.

The monthly meeting of the Administrative Committee of the Lancashire, Cheshire, and North Wales Federation was held at the Board-room, Manchester, on Friday, November 12th, when the president (Mr. W. Cooke, jun.) occupied the chair. Before proceeding with the business on the agenda, the president referred in sympathetic terms to the death of Mr. G. H. Storrs (brother to Mr. James Storrs, J.P.), and the tragic circumstances attending it, and moved a vote of condolence and sympathy with Mrs. G. H. Storrs, Mr. James Storrs, and Miss Lindley.

It was reported that a deputation from the Bolton Association had waited upon a firm of architects in that district who had recently made a practice of asking for a three years' maintenance in their contracts, with the result that they had agreed to leave the time open to be agreed upon at the time the contract is signed. The Bolton Association were asked to keep the committee fully informed as the matter proceeds.

Messrs. J. G. Davies and Co., builders and contractors, Crodsham, were elected to individual membership of the Federation.

Notice of several alterations to the Conciliation Board rules was read from the National secretary, and after discussing the same at some length, it was resolved: "That with the exception of proposal (c), which is entirely a matter between the operatives themselves, this Committee cannot recommend the adoption of the suggested amendments."

A letter was read from the National secretary stating that owing to the fortnight's recess in the House of Commons the meeting of the Departmental Committee on Railway Agreements had been postponed, and that the time allowed for the preparation of evidence thereon had been extended in consequence. It was agreed that a copy of the communication be sent to the local associations with a request that they give the matter their consideration.

It was agreed to invite suggestions from the local associations on the question of the "Conditions under which tenders are sent in," to be forwarded on to the National Committee, who are at present dealing with the matter.

A communication was read from the secretary of the Northern Centre on the question of "uniformity of Federation rules," and it was agreed that copies of the rules of this Federation be supplied as requested, with an intimation that this committee recommend their adoption as a basis for uniformity.

It was reported that the dispute between the Altrincham Association and the Operative Joiners' Society, regarding their boundary, had not yet been settled, and Mr. J. Hamilton, Altrincham, reported their position. After discussion, the secretary was instructed to write the Manchester, Altrincham, and Stockport Associations requesting them to forward a map showing their boundaries on the Altrincham side to the Manchester Operatives' secretary, and, failing a settlement, the matter should be again reported to this committee.

The sub-committee appointed to consider the question of "Delayed Payments in Contracts," gave their report, which suggested some amendments to Clause 30 of the National contract form. Ultimately it was agreed to postpone the matter until the next meeting, and that in the meantime the recommendations of the sub-committee be printed and a copy sent to every member of this committee. The secretary was also instructed to write asking that the matter be placed on the agenda for the next meeting of the National Administrative Committee.

The secretary reported that the recommendations of the sub-committee appointed to consider the Government schedule of contract prices had been sent on to the National secretary.

A letter was read from the Bury Association on the question of "guarantors to corporate and other bodies," and it was agreed that the matter be placed on the agenda for the next meeting, and that each member of the committee be supplied with a copy of the letter.

The secretary presented a preliminary statement of the reserve fund account, and asked for instructions therein. It was resolved that a further appeal should be sent to all local associations.

Some discussion took place regarding the affiliation of the Adlington district with the Bolton Association, but as the secretary had for some time been endeavouring to organise that district with Chorley, the matter was left in his hands.

The quarterly meeting of the Plasterers' Trade Committee of the Federation was held at the Boardroom of the Liverpool Master Builders' Association, 24, Sir Thomas Street, on Wednesday, December 1st, when Mr. James Higson, J.P., Manchester, presided over an attendance of six representatives from the various towns.

The report of the sub-committee appointed to consider the desirability of amending the sub-contract form was then considered, together with a draft amended form. After considerable discussion, it was resolved that, subject to one or two amendments, the proposed form be sent on to the various trade committees, with a request that they will give the same due consideration.

The chairman gave his report on the recommendations made to the schedule of contract prices for Government work, which was considered satisfactory.

Other matters of branch trade interest were discussed, but no formal resolutions were passed.

The Finance Committee met at the Boardroom, Manchester, on Friday, December 3rd, to consider matters of Federation finance, and their report will be presented to the Administrative Committee at their next meeting.

The half-yearly general meeting of this Federation has been fixed to be held at the Hotel St. George, Lime Street, Liverpool, at 2.30 o'clock, on Monday, December 20th next.

The Executive Board will hold their quarterly meeting at the same place prior to the half-yearly meeting at 12.45 o'clock (noon).—JOHN TOMLISON, Secretary.

BARROW-IN-FURNESS ASSOCIATION.

Secretary: J. Baker.

The monthly meeting of Barrow-in-Furness Association was held on November 23rd.

Communications were read from the firm written to regarding the providing of quantities with tenders for over £30, and also from the railway company regarding better telephonic communication. The secretary was instructed to ask for an interview with the former; the latter matter is still pending.

A communication was read from the operative plasterers with respect to others than their own trade doing their work. It was resolved to reply that the job in dispute was so small that it was not deemed worth while to send for a man specially to do the work.

Two new members were balloted for and accepted. The secretary reported that tenders had been asked for without quantities for work in connection with the Labour Exchange's proposed offices, the cost of which would amount to considerably more than the limit allowed for by rule. The secretary had communicated with the members, who had been invited to tender, and also with the authorities requiring the tenders, and it was now understood that quantities were being prepared.

Arrangements were made for the annual dinner.

MANCHESTER, SALFORD, AND DISTRICT ASSOCIATION.

Secretary: John Tomlison.

The monthly meeting of the Master Plasterers and Painters' Branch of this association was held at the Boardroom, Blackfriars Street, on Tuesday, November 9th, when Mr. T. A. Locan occupied the chair.

The question of fixing a subscription to meet incidential expenses incurred by the branch was considered, and a recommendation made to the General Committee.

The question of rescinding Rule 3 of the branch rules was down for consideration, and after discussion it was decided to postpone the matter until the next meeting.

The proposed agreement with the Plaster Partition Manufacturers regarding the fixing and finishing of their partitions was again on the agenda, but owing to the decision regarding the branch rules, it was thought advisable to defer the matter until the next meeting.

The monthly meeting of the Plaster Partition Manufacturers was held on Tuesday, November 16th, when the chief matter under consideration was the proposed agreement with the master plasterers.

The quarterly meeting of the General Committee was held at the Boardroom, on Thursday, November 18th, the president (Mr. Samuel Gerrard) in the chair.

The half-yearly report, as drafted by the secretary, was taken as read, and recommended to the half-yearly general meeting.

A communication was read from the L.C. and N.W. Federation regarding the Altrincham boundary, and the secretary was instructed to write to the secretary of the Manchester Operative Joiners' Society in accordance with the Federation's request.

A recommendation from the Plasterers' and Painters' Branch to impose a subscription on members of the branch to cover incidental branch expenses was duly confirmed.

The half-yearly general meeting of the association was held at the close of the above meeting, when the president (Mr. Samuel Gerrard) again occupied the chair.

The half-yearly report as presented by the committee was taken as read, and was adopted for circulation to the members. The report which gives a full account of the workings of the association during the past half-year is very satisfactory, considering the very depressed state of trade, and in very concise form shows the usefulness of a strong building trades organisation in a city like Manchester.

The secretary was instructed to call, before issuing the report, a meeting of the bricklayers' branch, with a view to getting them to appoint their trade committee.

A recommendation from the committee to amend Rules 5 and 9, so as to provide that the monthly meetings of the committee and the half-yearly general meetings shall be held on "third" instead of "second" Thursdays in the month, was considered and adopted.

It was agreed to adopt the Federation arbitration rule locally, and to print the same in the rule books.

The question of strictly enforcing the inter-trading rule was referred to the General Committee.

It was agreed that the association should nominate Mr. Thomas Rowbotham, plumber, in addition to the two present members—Messrs. H. Matthews, J.P., and Wm. Tinker—to represent the L.C. and N.W. Federation on the National and Northern Centre Executive Councils.

Communications were read from the L.C. and N.W. Federation with reference to the "Departmental Committee on Railway Agreements" and the "Conditions under which tenders are sent in." but it was decided to take no action in the matter.

A recommendation from the plasterers' and painters' branch to adopt a rule that each member of the branch shall pay a subscription of 4s. 6d. per annum in addition to the annual subscription to the association, to meet incidental expenses incurred by the branch, was unanimously adopted

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A special meeting of the Master Builders' Committee of the association was held at the Boardroom, on November 26th, to consider the conditions for the Salford Town Hall Annexe Extension contract. After considering the matter at some considerable length, it was resolved that a letter be sent to the Town Clerk informing him that the conditions were such as could not be ac-

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cepted by members of this association, and requesting him to receive a deputation thereon.

The secretary was also instructed to circularise the members informing them of the decision of this meeting, and requesting them to refrain from tendering until the conditions are considerably modified.

As a result of the action taken by the association in this matter, and the deputation's interview with the Town Clerk, it is expected that the conditions will be somewhat amended, but definite information is not yet to hand. It is, however, officially understood that the time for the tenders to be sent in has been extended, and that therefore the matter is receiving the consideration of the Borough Committee.

In accordance with instructions received from the half-yearly general meeting, a meeting of the bricklayers' branch was called on Thursday, December 2nd; and although there was only a very meagre attendance, the Branch Trade Committee was duly appointed, subject to confirmation at a fuller meeting.

YORK ASSOCIATION.

Secretary: J. Hague, Solicitor.

An Executive meeting of York Association was held at the Old George Hotel Pavement, on Wednesday, December 1st, the Lord Mayor in the chair.

Mr. Biscombe reported the result of the discussion at last Federation meeting on the draft sub-contract form, with reference to which a suggested addition had been made by the local association.

Correspondence was read from the secretary to operative plasterers re formation of joint committees, decision on which would be sent us after their December meeting. A letter was read from the Yorkshire Federation with reference to tendering for certain work, as to which a difficulty had arisen owing to the objectionable nature of the conditions. It was resolved that we notify our members as to the desirability of not tendering until the conditions were considerably modified.

It was unanimously agreed that the president, vice-president, treasurer, and secretary be recommended for re-election at the annual meeting.

With reference to the Executive, it was considered that, having regard to the importance of the work to be done and the undoubted spread of interest amongst the members in the work of the association and Federation generally, it was very desirable that the number of members composing the committee should be increased. It was felt that such a step would also encourage still more the interest of the younger members, and considerably add to the progressive nature of the association. It was therefore decided to recommend to the general annual meeting that the existing rule be amended in order to allow the introduction of five additional members on the Executive.

It was resolved that the chairman should make a special appeal to the members at the annual meeting to support the National reserve fund.

Proposed amendments to National Conciliation Board rules were read and considered, but no recommendation was made at the meeting. It was considered the proposals required further consideration. It was thought that the proposals, if carried, would remove the question of settlement of disputes away from the proper quarter; and the appointment of a fixed paid official of the Board of Trade was thought unlikely to prove the most satisfactory way of dealing with any dispute which got so far as the National Board, and which even they were unable to settle. It was resolved to recommend thorough discussion of the proposals at the next general meeting.

The meeting recommended that a register of accidents to workmen would be most useful to the association, and the matter would be placed before the annual meeting for adoption.

Two new members were elected.

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Provisional List.—Subject to Further Revision.

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COMPARATIVE STATEMENT showing the hours worked per week, and the rate of wages per hour in the various branches of the Building Trade in the undermentioned Federated Towns.

EXPLANATORY.—The towns are grouped by Centres and Federations, each group in two sections—A, containing towns and cities of over 100,000 inhabitants, and B those of 100,000 inhabitants and under.

Information as to non-federated towns may be had from the undersigned on application.

A. G. WHITE, Secretary, 31 & 32 Bedford Street, Strand, London, W.C.

NOTES.—Where a sliding scale of hours is worked in winter the average of hours is given. The Mason's rate given is for Bankers; Fixers usually ½d. per hour extra. Abbreviations—l-dk, light to dark; a-m, As Men. B=Bankers; F=Fixers.

NOTICE.—This list is subject to further revision, the returns being incomplete at the time of going to press.

ENGLAND AND WALES.	MASONS.				BRICKLAYERS.				CARPENTERS and JOINERS.				PLASTERERS.				SLATERS.				PLUMBERS.				PAINTERS.				MASONS' LABOURERS.				BRICKLAYERS' LABOURERS.				PLASTERERS' LABOURERS.			
	SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.	
	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.
NORTHERN CENTRE.																																								
Northern Counties Federation.																																								
A. **Newcastle-on-Tyne**	44½	9½	41½	9½	50	9½	44	9½	50	9½	44	9½	50	9½	44	9½	50	9½	44½	9½	53	9	47	9	50	8½	37	8½	a-m	6¼	a-m	6¼	50	6¼	44	6¼	50	6¼	44	6¼
Sunderland	B47 F50	9½	B41½ F44	9½	50	9½	44	9½	50	9¼	44	9½	50	9½	44	9½	50	9½	42	9½	53	‡38/6	53	38/6	50	8½	l-dk	8½	a-m	6¼	a-m	6¼	50	6¼	44	6¼	50	6¼	44	6¼
B. **Blyth**	44½	9½	41½	9½	50	9½	44	9½	50	9½	44	9½	50	9½	44	9½	50	9½	44½	9½	53	9	47	9	50	8½	37	8½	a-m	6¼	a-m	6¼	50	6¼	44	6¼	50	6¼	44	6¼
Hartlepools	50	9½	41½	9½	53	9½	44½	9½	50	9¼	44½	9¼	53	9½	47	9½	50	9½	..	9½	53	9	53	9	53	8	..	8	50	6½	41½	6½	53	6½	44½	6½	53	7	47	7
Middlesbrough	49½	9	47	9	52	9½	47	9½	50	9¼	44	9¼	52	9½	52	9½	50	9½	44½	9½	53	9	53	9	52	8	40	8	49½	6¼	47	6¼	52	6¼	47	6¼	52	6¾	52	6¾
Shields (North)	44½	9½	41½	9½	50	9½	44	9½	50	9½	44	9½	50	9½	44	9½	50	9½	44½	9½	53	9	47	9	50	8½	37	8½	a-m	6¼	a-m	6¼	50	6¼	44	6¼	50	6¼	44	6¼
Shields (South)	44½	9½	41½	9½	50	9½	44	9½	50	9½	44	9½	50	9½	44	9½	50	9½	44½	9½	53	9	47	9	50	8½	37	8½	a-m	6¼	a-m	6¼	50	6¼	44	6¼	50	6¼	44	6¼
Stockton-on-Tees	50	9	47½	9	52	9½	47½	9½	50	9¼	44	9¼	53	9½	47	9½	52	9½	43	9½	53	9	53	9	53	8	44	8	50	6¼	47½	6¼	52	6¼	47½	6¼	53	6¾	47	6¾
Yorkshire Federation.																																								
A. **Bradford**	49½	9	l-dk	9	49½	9	l-dk	9	49½	8½	41½	8½	49½	8½	44	8½	49½	9	47	9	49½	9	46	9	52	8	48	8	49½	6	l-dk	6	49½	6	l-dk	6	49½	6½	44	6½
Halifax	49½	9	40	9	49½	9	40	9	49½	8¼	43½	8¼	51½	8½	48	8½	51½	8½	48	8½	49½	8	49½	8	50½	8	42	8	49½	6	40	6	49½	6	40	6	51½	6½	48	6½
Hull	53	9¼	45½	9¼	53	9	45½	9	53	9	45½	9	53	9	45½	9	53	9	45½	9	53	9	45½	9	53	8	45½	8	53	6½	45½	6½	53	6½	45½	6½	53	6½	45½	6½
Leeds	49½	9½	l-dk	9½	49½	9½	l-dk	9½	49½	9	42½	9	49½	9½	44	9½	50	9	45	9	49½	9	44	9	50	8	44	8	49½	6½	l-dk	6½	49½	6½	l-dk	6½	49½	7	44	7
Sheffield	49½	9½	44	9½	49½	9½	44	9½	49½	9	45½	9	49½	9	45	9	52	9	47	9	49½	9	47	9	55	7½	48	7½	49½	6	44	6	49½	6	44	6	49½	6	45	6
B. **Barnoldswick**	48½	8	42	8	48½	8	42	8	55	7½	46½	7½	49	8	38	8	49	8	38	8	54½	8½	46½	8½	55	6½	45	6½	48½	6	42	6	48½	6	42	6	49	6	38	6
Barnsley	49½	9	44	9	49½	9	44	9	49½	8½	44	8½	50	9	44½	9	50	8½	44½	8½	50	8½	50	8½	Var	8	Var	8	49½	6½	44	6½	49½	6½	44	6½	50	6½	44½	6½
Bridlington	55	8½	44	8½	55	8	44	8	55	7½	44	7½	55	8	44	8	55	10	44	10	55	9	44	9	55	7½	44	7½	55	6	44	6	55	5	44	5	55	5	44	5
Dewsbury	49½	8½	44	8½	49½	8½	44	8½	49½	8	44	8	49½	8½	44	8½	49½	7½	44	7½	49½	7½	44	7½	49½	7½	44	7½	49½	6	44	6	49½	6	44	6	49½	6	44	6
Grimsby	53	9	49½	9	53	9	49½	9	53	8	49½	8	53	9	47½	9	53	8½	47½	8½	53	8	41½	8	53	7½	41½	7½	53	6	49½	6	53	6	49½	6	53	7	47½	7
Harrogate	49½	9	45	9	49½	9	45	9	49½	8½	45	8½	49½	9	45	8	50	8½	44	8½	49½	9	43½	9	49½	7½	45	7½	49½	6	45	..	49½	6	45	6	49½	6	45	6
Huddersfield	49½	9	49½	9	49½	9	49½	9	49½	8½	49½	8½	49½	8½	49½	8½	49½	9	49½	9	50	8½	50	8½	52½	8-8½	42	8-8½	49½	6	49½	6	49½	6	49½	6	49½	6	49½	6
Malton	52	8	48½	8	54½	7½	48½	7½	54	7	48	7	54½	7½	48	7½	54½	8	48	8	54½	7	48	7	54½	7	48	7	52	5½	48½	5½	54½	5	48½	5	54	5	48	5
Morley	49½	8½	44	8½	49½	8½	44	8½	49½	8	41½	8	49½	9	44	9	49½	9	44	9	..	..	..	..	..	..	..	..	49½	6	44	6	49½	6	44	6	49½	6	44	6
Scarborough	52	8½	44	8½	52	8½	44	8½	52	8	44	8	52	8	44	8	52	8	44	8	52	8	47	8	53	8	44	8	52	6	44	6	52	6	44	6	52	6	44	6
Selby	53	9	48	9	55½	9	48	9	55½	8	48	8	55½	9	48	9	55½	9	48	9	55½	7½	48	7½	55½	7	48	7	53½	6	48	6	55½	6	48	6	55½	6	48	6
Shipley	49½	8¾	l-dk	8¾	49½	8¾-9	l-dk	8¾-9	49½	8½	41½	8½	49½	8½	44	8½	49½	8½	42	8½	49½	9	47	9	52	7¾	40	7¾	49½	6	l-dk	6	49½	6	l-dk	6	49½	6	l-dk	6
Wakefield	49½	9	l-dk	9	49½	8½	l-dk	8½	49½	8	l-dk	8	50	8	l-dk	8	50	8½	l-dk	8½	50	7½	l-dk	7½	52½	7½	l-dk	7½	49½	6	l-dk	6	49½	6	l-dk	6	50	6	l-dk	6
York	50	9	41½	9	53	9	44½	9	53	8¼	44½	8¼	53	9	44½	9	53	9	44½	9	53	8	47	8	49½	7½	44	7½	50	6	41½	6	53	6	44½	6	53	6	44½	6
Lancashire, Cheshire, and North Wales Federation.																																								
A. **Birkenhead**	46½	10	42¾	10	49½	9½	42¾	9½	46½	10	46½	10	49½	9½	44	9½	49½	10	42¾	10	49½	9½	42½	9½	49½	8¾	39	8¾	46½	6½	42¾	6½	49½	6½	42¾	6½	49½	6½	44	6½
Bolton	48½	9½	44	9½	49½	10	47	10	49½	9½	47	9½	49½	10	41½	10	49½	9	41½	9	48½	9	46	9	51½	9	l-dk	9	..	..	..	..	..	..	..	..	..	..	..	..
Liverpool	47	10	43¼	10	47	10	43¼	10	47	10	47	10	49½	9½	45¼	9½	49½	9½	45¼	9½	49½	9¾	44	9¾	49½	8¾	44	8¾	47	5	43¼	5	49½	5½	44	5¾	49½	6	45¼	6
Manchester	49½	9½	42¾	9½	54½	10	42	10	49½	9½	42	9½	49½	10	45½	10	56	9	46¼	9	49½	9½	47	9½	52	9	41½	9	46½	5½	42¾	5½	54½	6	42	6	52	7	47	7
Oldham	48½	9½	44	9½	54½	10	47½	10	51	9½	46	9½	49	9	41½	9	54	8½	46½	8½	51½	9	45	9	54	8½	45	8½	48½	6	44	6	54½	6½	47½	6½	49	7	44½	7
Preston	49½	9½	42	9½	49½	10	44	10	49½	9¼	40	9¼	49½	9	41	9	49½	8½	42½	8½	49½	9	..	9	49½	8½	..	8½	..	..	..	..	..	..	..	..	..	..	..	..
B. **Altrincham**	49½	9½	41½	9½	54½	9½	42½	9½	49½	9½	44	9½	52	10	47	10	52	8½	44	8½	49½	9	46½	9	52	8½	44	8½	49½	6	41½	6	54½	6	42½	6	52	7	47	7
Ashton-under-Lyne	49½	9½	41½	9½	54½	10	41½	10	53½	9	46	9	53½	10	40	10	..	..	..	..	53½	9	46	9	54½	8½	44	8½	49½	5½	41½	5½	54½	5½	41½	5½	53½	6½	40	6½
Barrow-in-Furness	49½	9	44	9	54	9	44	9	54	8¾	46½	9	54	9	46½	9	54	9	46½	9	54	8½	49	9	54	8¼	44	8½	49½	6½	44	6½	54	6½	44	6½	54	6½	46½	6½
Blackpool	49½	9¾	44	9¾	49½	9½	44	9½	49½	8½	44	8½	49½	9½	44	9½	49½	8¾	44	*8¾	49½	8½	47	8½	49½	8	l-dk	8	49½	6	44	6	49½	6	44	6	49½	6	44	6
Burnley	49½	9	44	9	49½	9½	44	9½	51	8½	46½	8½	54	8½	49	8½	54	8	49	8	54	8	49	8	..	..	..	..	49½	6	44	6	49½	6	44	6	54	6	49	6

ENGLAND AND WALES (*continued*).	MASONS.				BRICKLAYERS.				CARPENTERS and JOINERS.				PLASTERERS.				SLATERS.				PLUMBERS.				PAINTERS.				MASONS' LABOURERS.				BRICKLAYERS' LABOURERS.				PLASTERERS' LABOURERS.			
	SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.	
	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.
Chester	49½	9	44	9	54½	9	47	9	54½	8½	47	8½	54½	9	47	9	54½	9	47	9	54½	8½-8¾	47	8½8¾	54½	7½	44	7½	49½	5½	44	5½	54½	5¾	47	5¾	54½	5-5¾	47	5-5¾
Crewe	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Darwen	49	9½	44	9½	49	9½	44	9½	49	9½	44	9½	49	9	44	9	..	..	..	..	49	9	44	9	49	8½	44	8½	49	..	44	..	49	..	44	..	49	..	44	..
Heywood	48½	9½	l-dk	9½	53½	10	l-dk	10	53½	9	46	9	53½	9	l-dk	9	53½	8	l-dk	8	..	..	..	..	56½	8½	l-dk	8½	53½	6½	l-dk	6½	53½	6½	l-dk	6½	53½	6½	l-dk	6½
Hyde. *See* **Ashton**	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lancaster	49½	9½	41½	9½	49½	10	41½	10	49½	8½	49½	8½	49½	9	44	9	49½	9	44	9	53	8	47	8	49½	8½	49½	8½	49½	5½	41½	5½	49½	5½	41½	5½	49½	6	44	6
Leigh	53½	9½	l-dk	9½	53½	9½	l-dk	9½	48½	9½	44¾	9½	53½	9	48½	9	53½	8½	l-dk	8½	54	9	47	9	54	9	48½	9	53½	6	l-dk	6	53½	6½	l-dk	6½	53½	6½	48½	6½
Llandudno	55	8½	l-dk	8½	55	8	l-dk	8	55	7¾	51½	7¾	55	8	51½	8	55	8	51½	8	55	8	47½	8	55	7½	l-dk	7½	55	5	l-dk	5	55	5	l-dk	5	55	5	51½	5
Longridge	49½	9½	l-dk	9½	..	..	..	..	49½	7½	l-dk	7½	49½	8	l-dk	8	49½	8	l-dk	8	49½	8½	l-dk	8½	49½	8½	l-dk	8½	49½	6	l-dk	6	..	..	..	..	49½	5½	l-dk	5½
Macclesfield	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Middleton	48½	9½	41½	9½	53½	10	43	10	54	9	41½	9	48½	9	41½	9	53½	8½	l-dk	8½	54	9	47	9	54	8½	47	8½	48½	5½	41½	5½	53½	6½	43	6½	48½	6½	41½	6½
Radcliffe	48½	9½	41	9½	54½	10	41½	10	49	9½	43	9½	54	9	41½	9	54	8½	l-dk	8½	49	9	45	9	51½	8½	l-dk	8½	48½	6	43	6	54½	6½	41½	6½	54	6½	41½	6½
Rochdale	48½	9½	40	9½	53½	10	42	10	48½	9	38½	9	48½	9	41½	9	48½	8¼	l-dk	8¼	49	9	46½	9	54	8½	l-dk	8½	48½	6	40	6	53½	6	42	6	48½	6	41½	6
Rossendale	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Southport	49½	9	..	9	49½	9	..	9	49½	9	..	9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
St. Anne's-on-Sea	49½	9½	47	9½	49½	9½	47	9½	49½	8½	47	8½	49½	9½	47	9½	49½	8½	47	8½	49½	8½	47	8½	49½	8	47	8	49½	6½	47	6½	49½	6½	47	6½	49½	6½	47	6½
St. Helens	46½	9	Var	9	53½	9	45	9	50	9¼	46½	9¼	46½	9	Var	9	54	9	46½	9	54	8½	50	8½	54	8¼	50	8¼	46½	5½	Var	5½	53½	6	Var	6	46½	6	Var	6
Stalybridge. *See* **Ashton**	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Stockport	49	9½	41	9½	54½	9½	47	9½	54½	9	47	9	54½	10	47	10	54½	9	47	9	54	9	47	9	..	..	..	..	49	6	41	6	54½	6	47	6	54½	7	47	7
Wallasey	47	10	43	10	49½	9¾	46½	9¾	47	10	47	10	49½	9½	46½	9½	49½	9½	46½	9½	49½	9½	42½	9½	49½	8¾	42½	8¾	47	7	43	7	49½	7	46½	7	49½	7	46½	7
Warrington	..	8¾	..	8¾	54½	9¼	45	9¼	54½	9¼	45	9¼	54½	9½	45	9½	..	8½	..	8½	..	9¼	..	9¼	..	8	..	8	..	5 to 6	..	5-6	54½	5 to 6	45	5-6	54½	5 to 6	45	5-6
Wigan	49½	9½	41½	9½	54½	10	45	10	49½	9	44	9	54½	9	46½	9	55½	9	48	9	54½	9	47	9	54½	8½	39	8½	49½	5½-6	41½	5½-6	54½	6½-7	45	6½-7	54½	6¼	46½	6¼
MIDLAND CENTRE.																																								
A. **Birmingham**	51	10	45	10	51	9½	45	9½	51	9½	45	9½	51	10	45	10	..	..	..	..	..	..	..	..	..	..	..	..	51	6½	45	6½	51	6½	45	6½	51	6½	45	6½
Derby	53	9	44	9	56	9	47½	9	56	8½	47½	8½	56	9	47½	9	56	9	47½	9	56	8½	47½	8½	56	7½	47½	7½	53	5½	44	5½	56	5½	47½	5½	56	6	47½	6
Leicester	53	9½	47	9½	53	9	47	9	53	9	47	9	53	10	47	10	..	..	..	..	53	9	47	9	..	..	..	..	53	6½	47	6½	53	6½	47	6½	53	..	47	..
Nottingham	51½	9½	41½	9½	51½	9	41½	9	51½	9	41½	9	51½	10	41½	10	51½	9	41½	9	54	9	47	9	51	8½	41	8½	51½	6½	41½	6½	51½	6½	41½	6½	51½	6½	41½	6½
B. **Bromsgrove**	56½	8	51	8	56½	7½	51	7½	56½	7	51	7	56½	7½	51	7½	56½	7½	51	7½	56½	8	51	8	56½	6	51	6	56½	4	51	4	56½	4	51	4	56½	4	51	4
Burton-on-Trent	54	8½	47	8½	54	8½	47	8½	54	8½	47	8½	54	8½	47	8½	54	8½	47	8½	54	8	47	8	54	7¼	47	7¼	54	6	47	6	54	5¾	47	5¾	54	..	47	..
Coventry	53	† 9	44	9	55½	9	47	9	55½	9	47	9	55½	9	47	9	55½	9	47	9	55½	9	47	9	55½	8	47	8	53	6	44	6	55½	6	47	6	55½	6½	47	6½
Dudley	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
King's Norton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Leamington	56½	8½	48	8½	56½	8	48	8	56½	8	48	8	56½	8½	48	8½	56½	8	48	8	56½	8	48	8	56½	7	48	7	56½	5	48	5	56½	5	48	5	56½	5	48	5
Long Eaton	54	9	44	9	54	9	44	9	54	8½	44	8½	54	9	44	9	54	9	44	9	54	8½	44	8½	54	7	44	7	54	6½	44	6½	54	6	44	6	54	6	44	6
Malvern	56½	†8	45	8	56½	8	45	8	56½	8	45	8	56½	8	45	8	56½	8	45	8	56½	8	45	8	56½	6½	45	6½	56½	5½	45	5	56½	5	45	5	56½	5	45	5
Mansfield	55	8½	45	8½	55	8½	45	8½	55	8	47½	8	55	..	45	..	..	..	..	..	55	8½	47½	8½	55	7	45	7	55	5½	45	5½	55	5½	47½	5½	55	..	45	..
Northampton	55½	8½	47	8½	55½	8½	47	8½	55½	8½	47	8½	55½	8½	47	8½	55½	8½	47	8½	55½	8½	47	8½	55½	8½	47	8½	55½	5½	47	5½	55½	5½	47	5½	55½	5½	47	5½
Newark	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
North Staffordshire	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Nuneaton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Redditch	56½	7½	48	7½	56½	7½	48	7½	56½	7½	48	7½	56½	7½	48	7½	56½	7½	48	7½	56½	7½	48	7½	56½	7	48	7	56½	4½	48	4½	56½	4½	48	4½	56½	5	48	5
Stafford	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Stourbridge	56½	8½	45	8½	56½	8	45	8	56½	8	45	8	56½	8½	45	8½	‡	..	..	..	56½	8	45	8	56½	7	45	7	56½	5½	45	5½	56½	4½	45	4½	56½	5	45	5
Walsall	55½	9	50½	9	55½	8½	49	8½	55½	8½	49	8½	55½	8½	49	8½	55½	8½	49	8½	55½	8½	49	8½	55½	7¼	49	7¼	55½	6½	49	6½	55½	5¾	49	5¾	55½	6	49	6
West Bromwich	54	9½	45	9½	54	9	45	9	54	8½	45	8½	54	9	46	9	..	..	..	..	56½	8	42½	8	56½	7	42½	7	54	6½	45	6½	54	6	45	6	54	6	45	6
Wolverhampton	53	9	37	9	53	9	37	9	53	9	37	9	..	..	..	..	53	8	37	8	53	9	37	9	54	7½	42½	7½	53	6	37	6	53	6	37	6	..	..	..	..
Worcester	54	*8½	42½	8½	54	8½	42½	8½	54	8½	42½	8½	54	8½	42½	8½	54	8½	42½	8½	54	8½	42½	8½	54	8½	42½	8½	54	5½	42½	5½	54	5½	42½	5½	54	5½	42½	5

* Fixers ¾d. extra. † Fixers ½ d. extra. ‡ Done by sub-contract.

ENGLAND AND WALES (continued.)	MASONS.				BRICKLAYERS.				CARPENTERS and JOINERS.				PLASTERERS.				SLATERS.				PLUMBERS.				PAINTERS.				MASONS' LABOURERS.				BRICKLAYERS' LABOURERS.				PLASTERERS' LABOURERS.			
	Summer.		Winter.		Summer.		Winter.		Summer.		Winter.		Summer.		Winter.		Summer.		Winter.		Summer.		Winter.		Summer.		Winter.		Summer.		Winter.		Summer.		Winter.		Summer.		Winter.	
	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Wages per Hour.	Hours per Week.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.
SOUTH-EASTERN CENTRE.																																								
Eastern Counties Federation.																																								
A. **Norwich**	56	8	48	8	56	8	48	8	56	8	48	8	56	8	48	8	56	8	48	8	56	8	48	8	56	6½	48	6½	56	5	48	5	56	5	48	5	56	5	48	5
B. **Cambridge**	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Yarmouth	56½	7-7½	47	7-7½	56½	7½	47	7½	56½	7½	47	7½	..	..	..	..	..	..	..	..	56½	7½	47	7½	56½	6	47	6	56½	4½	47	4½	56½	4½	47	4½	..	..	..	..
London Federation.																																								
A. **London**	50	10½	44	10½	50	10½	44	10½	50	10½	44	10½	50	11	44	11	..	..	..	..	50	11	44	11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Southern Counties Federation.																																								
A. **Brighton**	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Portsmouth	55½	8½	45	8½	55½	8½	45	8½	55½	8	45	8	55½	8½	45	8½	..	..	..	..	..	7½	..	7½	55½	6½	45	6½	55½	6	45	6	55½	6	45	6	55½	6	45	6
Southampton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
B. **Chatham**	55½	8	49	8	55½	9	49	9	55½	8½	49	8½	55½	9	49	9	55½	9	49	9	55½	8½	49	8½	55½	7	49	7	55½	5½	49	5½	55½	5½	49	5½	55½	5½	49	5½
Maidstone	55½	8½	45½	8½	55½	8½	45½	8½	55½	8½	45½	8½	..	..	..	..	..	..	..	..	55½	8½	45½	8½	55½	7½	45½	7½	55½	5½	45½	5½	55½	5½	45½	5½	55½	5½	45½	5½
SOUTH-WESTERN CENTRE.																																								
South-Western Federation.																																								
A. **Bristol**	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
B. **Bath**	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bridgwater	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cheltenham	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Exeter	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Gloucester	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hereford	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Stroud	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
South Wales Federation.																																								
A. **Cardiff**	54	9	45-8	9	54	9	45 8	9	54	9	45 8	9	54	9	45 8	9	54	9	45-8	9	54	9	45-8	9	54	8	45-8	8	54	5½-6½	45-8	5½6½	54	5½-6½	45-8	5½6½	54	5½-6½	45-8	5½6½
B **Newport (Mon.)**	56½	8½	47½	8½	53½	8½	47½	8½	56½	8½	47½	8½	56½	8½	47½	8½	56½	8½	47½	8½	56½	8½	47½	8½	56½	8	47½	8	56½	5½	47½	5½	56½	5½	47½	5½	56½	5½	47½	5½
Swansea	54	8½	48	8½	54	8½	48	8½	53	8½	47	8½	54	8½	48	8½	54	8½	48	8½	54	8½	48	9	54	8	48	8	54	5½-6	48	5½-6	54	5½-6	48	5½-6	54	5½-6	48	5½-6
Pontypridd	54	8½	50½	8½	54	8½	50½	8½	54	8	50½	8	54	9	50½	9	54	9	50½	9	54	8	50	8	60	7½	40½	7½	54	6	50½	6	54	6	50½	6	54	6	50½	6
IRELAND.																																								
A. **Dublin**	54	8½	SS½	8½	54	8½	SS½	8½	54	8	SS½	8	54	8	SS½	8	54	8	SS½	8	54	8	SS½	8	54	8½	SS½	8½	54	7½	SS	7½	54	4½	SS	4½	54	4	SS	4
Belfast	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
SCOTLAND.																																								
Scottish Federation.																																								
A. **Aberdeen**	51	8	45	8	..	..	..	..	51	8	45	8	51	8	40	8	51	8	40	8	48	8½	45	8½	51	8	40	8	51	5	45	A5	..	..	..	..	51	A4¾	40	A4¾
Alloa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dingwall	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dumfries	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dundee	50	8½	45	8½	55	10	44½	10	50	9	44	9	50	9	44	9	50	8½	44	8½	50	9	44	9	50	8½	44	8½	50	5½	45	5½	55	5½-6	44½	5½-6	50	5½	44	5½
Edinburgh	51	8½	45	8½	51	9½	45	9½	51	9	45	9	51	..	45	..	51	..	45	..	51	9	45	9	..	..	..	..	51	5-5½	45	5-5½	51	5½	45	5½	51	6	45	6
Glasgow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hawick	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
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Kilmarnock	51	8	47	8	51	8½	47	8½	51	9	45	9	51	9	45	9	56	8	47	8	51	8½	51	8½	51	9½	47	9½	51	5	47	5	51	5½	47	5½	51	5½	45	5½
Oban	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Paisley	51	9	40	9	51	9½	40	9½	51	9	45	9	51	9½	40	9½	51	9	40	9	51	9½	45	9½	51	9	45	9	51	6	40	6	51	6	40	6	51	6½	40	6½
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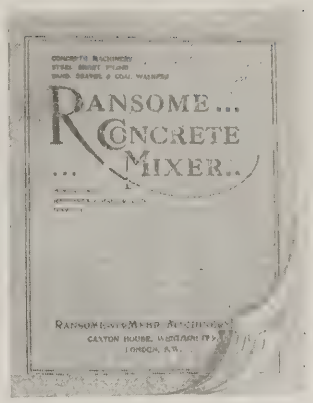

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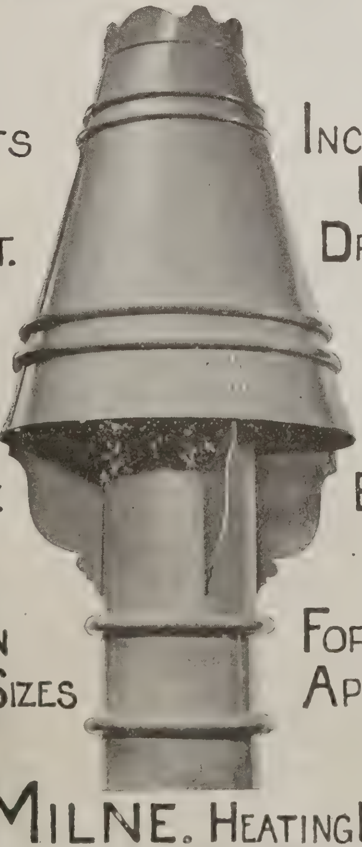

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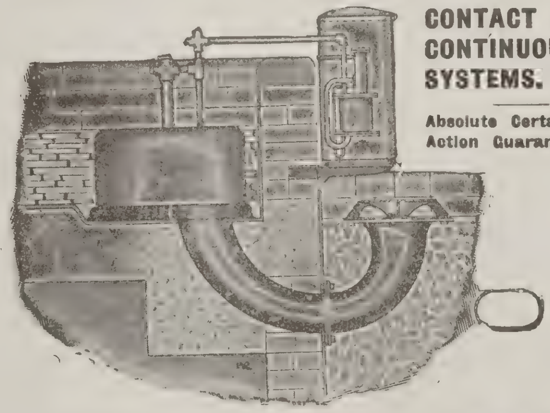

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Tenders.

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Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Barnsley.—Accepted for erection of a boys' grammar school in Shaw Lane, Barnsley, for the Governors of the Barnsley and District Holgate Grammar School. Messrs. Crouch, Butler and Savage, Birmingham, architects:—

W. R. Unwin, Ecclesfield, Sheffield, £12,795.

Cardiff.—For erection of fourteen cottages, etc., at Capel Llanilltern, near Creigiau, Llantrissant, Glamorganshire, for the Corporation of Cardiff. Mr. Wm. Harpur, M.I.C.E., city engineer.

J. H. Maggs and Co., Romilly Crescent	£7,920	0	0
E. Turner and Sons, Penarth Road	7,778	14	10
W. H. Evans, West Luton Place	7,249	0	0
Blacker Bros., Clive Road	7,100	0	0
Knox and Wells, Bangor Street	6,787	0	0
John and West, Llantrissant	6,669	19	3
W. Symonds and Sons,* Rectory Road	6,547	0	0

Rest of Cardiff.

*Accepted.

Coventry.—For erection of new warehouse at Upper York Street, for Messrs. Alfred Herbert, Ltd. Messrs. Tait and Herbert, architects, Leicester and Coventry.

A.

W. Higgins	£2,649	0	0
Exor. of C. Garlick	2,425	0	0
T. Hancox	2,195	0	0
Wellerman Bros.	2,165	10	0
F. Elliott	2,137	10	0
J. G. Gray*	2,037	0	0

B.

T. Hancox	£469	0	0
W. Higgins	438	0	0
Exor. of C. Garlick	425	0	0
J. G. Gray*	418	0	0
Wellerman Bros.	417	6	0
F. Elliott	412	17	0

*Accepted

Crediton.—For building a new secondary school for girls, for the Haywards Education Authority. Mr. Percy Morris, county architect (education), 1, Richmond Road, Exeter. Quantities by Mr. S. W. Haughton, 22, Courtenay Street, Plymouth.

J. Coats, Bristol	£9,798	1	3
H. Berry, Crediton	8,370	0	0
H. C. Goss, Torquay	7,998	18	10
D. Davies and Sons, Cardiff	7,647	19	5
W. E. Blake	7,500	0	0
W. E. Bennet, Bodmin	7,175	18	7
R. Pickett, Ilfracombe	7,081	10	9
Pollard and Co., Ltd., Taunton	6,950	18	6
Dart and Francis, Crediton	6,947	2	3
G. B. Turpin	6,947	0	0
A. N. Coles	6,913	0	0
Wakeham Bros.	6,839	6	11
Westcott, Austin and White, Exeter	6,750	0	0
F. J. Badcock, Ashburton	6,697	12	9
Pethick Bros.	6,572	0	0
J. Barnsley and Sons, Birmingham	6,514	0	0
C. Bryer, jun.,* Bridgwater	6,500	7	6

*Reserved for acceptance.

East Kirkby.—For the erection of a house, Diamond Avenue, East Kirkby, for J. G. Shacklock, Esq., J.P. Walter H. Woods, M.R.S.I., architect Central Chambers, High Street, Long Eaton, near Nottingham. Quantities by the architect.

J. Tate and Son, Annesley, Woodhouse	£469	10	0
Coleman and Blackburn, East Kirkby	445	0	0
Bains, Kirkby-in-Ashfield	439	10	0
A. W. Hoole,* Kirkby-in-Ashfield	429	15	0

*Accepted.

Egham.—Accepted for erection of an isolation hospital upon land at Northcroft Road, Englefield Green, for the Egham Urban District Council. Mr. Walter Gray, architect, Westwood, Egham Hill:—

King and Son, Egham Hill, Surrey, £2,439.

Evesham.—For erection of small detached house in Owlett's End, Cooper's Lane Estate, for Rev. R. Starling Boulter. Messrs. Dicks and Waldron, architects, Journal Buildings, Evesham.

Wm. White	£550
Espley and Co., Ltd.	510
Gorton and Shapcott, Gloucester	447
J. E. White	445
A. Cliff and Co.*	430

*Accepted.

(*Tenders continued on page viii.*)

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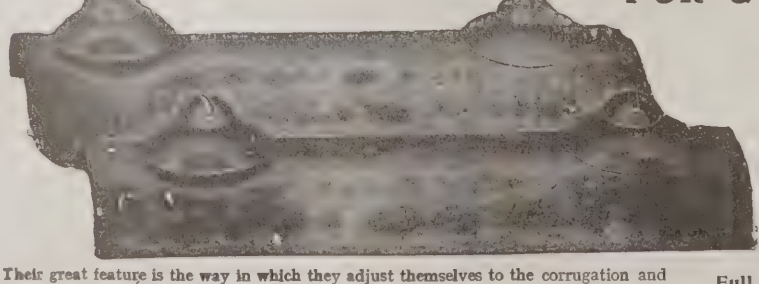

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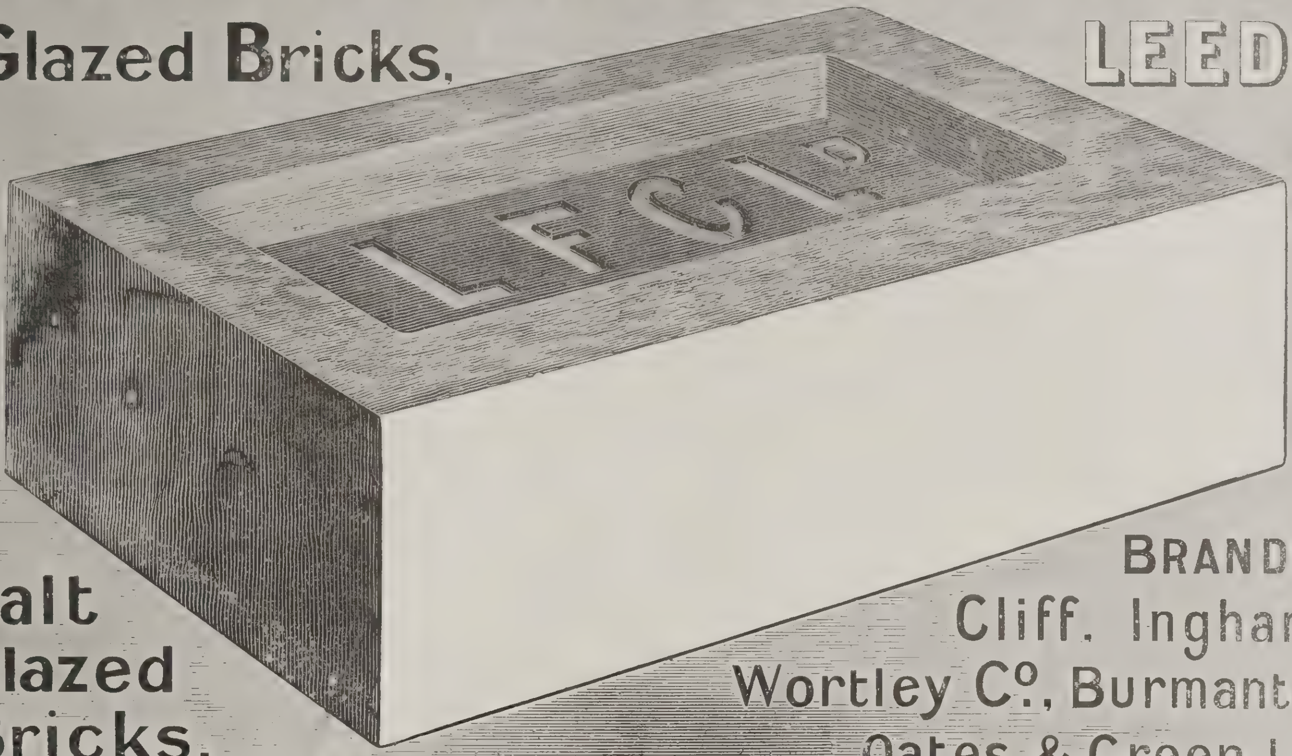

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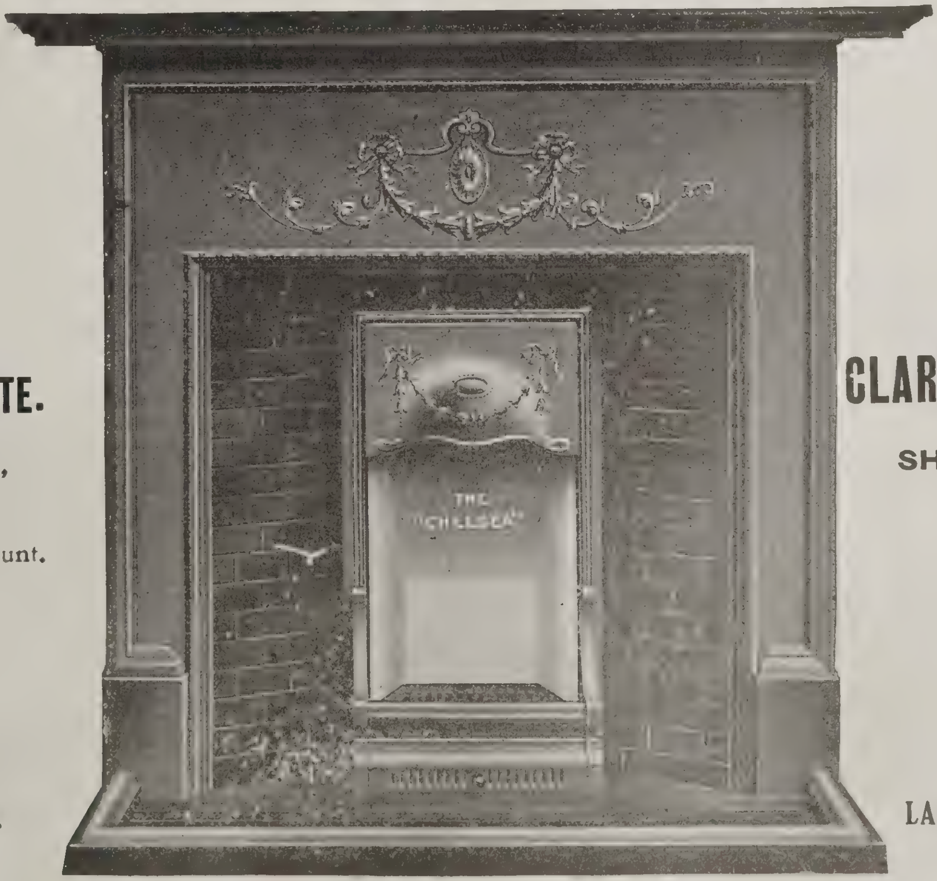

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(Tenders continued from page vi.)

Great Yarmouth.—Rebuilding N. Wing of front for "Palmers." Messrs. Geo. Baines and Son, 15, Cements Inn, London, W.C., A. S. Hewitt, Bank Chambers, Gt. Yarmouth, joint architects.

	Estimate No. 1.		(Reduction for 1 month extra time.)	Estimate No. 2.	
Chas. Wm. Wiseman	£3,740	0	£200	£3,540	0
G. E. Hawes and Son	2,989	0	15	2,974	0
Jas. Laggett	2,775	0	—	2,775	0
Carter and Wright ...	2,749	17	60	2,689	17
J. Youngs and Son ...	2,745	0	86	2,639	0
J. Eastoe*	2,797	0	145	2,652	0

***Accepted.**

Heavitree (Devon).—For new Council school (Ladysmith Road) for 360 infants, including covered shed, tar paving, etc., for the Devon County Education Committee. Mr. Percy Morris, county architect (education), 1, Richmond Road, Exeter. Quantities by Mr. B. Dawson, 6, Old Queen Street, Westminster, London, S.W.

E. P. Bovey and Sons, Torquay	£4,465	0	0
J. Honour and Sons, Tring ...	4,443	9	9
Lapthorn and Co., Plymouth...	4,295	0	0
Ham and Passmore	4,048	15	9
A. N. Coles, Plymouth ...	3,961	12	2
G. Setter and Son	3,949	6	11
Westcott, Austin and White ...	3,599	0	0
W. G. Coles, Alphington ...	3,575	6	7
Pethick Bros., Ltd., Plymouth	3,535	0	0
Stephens and Sons, Ltd. ...	3,534	9	2
J. Triggs	3,519	9	3
J. Pulman	3,498	17	8
G. Pollard and Co., Ltd., Taunton	3,482	11	9
Wakeham Bros.,* Plymouth ...	3,423	6	4

Rest of Exeter.
***Accepted.**

London, S.W.—For erection of a storehouse at Battersea, for the Metropolitan Water Board.

H. V. Smith and Co., Ltd. ...	£5,963	1	8
W. Reason	5,952	17	0
A. N. Coles	5,660	0	0
A. Monk	5,373	0	0
British Fireproof Construction Co.	5,170	0	0
H. C. Clifton	5,165	0	0
Foster and Dicksee, Ltd. ...	5,098	0	0
F. Webster and Son	5,064	0	0
W. Shurmur and Sons, Ltd. ...	4,986	0	0
A. Roberts and Co., Ltd. ...	4,955	0	0
H. Lovatt, Ltd.	4,903	17	6
F. and H. F. Higgs	4,880	0	0
E. Lawrence and Sons, Ltd. ...	4,816	0	0
J. Smith and Sons, Ltd. ...	4,795	0	0
W. J. Renshaw	4,795	0	0
Higgs and Hill, Ltd.	4,794	0	0
J. Carmichael	4,703	0	0
W. J. Fryer and Co.	4,698	0	0
T. Neath, Ltd.	4,662	14	10
Dick, Kerr and Co., Ltd. ...	4,630	0	0
Spencer, Santo and Co., Ltd ...	4,618	18	0
J. Mowlem and Co., Ltd ...	4,590	0	0
Kirk and Randall	4,581	0	0
C. Gray	4,569	0	0
W. Lawrence and Son ...	4,554	0	0
J. Garrett and Son	4,499	0	0
Perry and Co. (Bow), Ltd ...	4,489	0	0
Holloway Bros. (London), Ltd.	4,475	0	0
R. E. Nightingale	4,424	0	0
J. Aird and Sons	4,393	1	10
Nicholds and Reynolds, Ltd. ...	4,243	0	0
W. Pattinson and Sons, Ltd.*	3,997	0	0

***Accepted.**

Longworth (Berks).—For alterations and additions to Longworth House, for Mr. C. G. Hyde, M.P. Messrs. R. England and Son, architects, Oxford. Quantities by the architects.

Parnell and Son	£4,858
Estcourt and Sons	4,670
Kingerlee and Sons	4,467
Benfield and Loxley	4,120
Hutchings and Sons,* Oxford ...	3,980

***Accepted.**

March (Cambs.).—For erection of new grammar school buildings and alterations to the school house situate on the Station Road, March, for the Governors of the March Educational Foundation. Messrs. J. G. Stallebrass and Sons, architects, North Street, Peterborough, and Broad Street, March. Quantities by the architects.

Freeman, Oundle	£3,915	0	0
Whye	3,832	8	4
Moss, Loughborough	3,821	0	0
Cracknell, Peterborough ...	3,817	0	0
Rands, Wisbech	3,723	5	0
Redhead	3,682	0	0
Papworth	3,621	6	0
Spragg	3,620	0	0
Christmas	3,585	10	0
Guttridge, Peterborough ...	3,582	0	0
Gray, Peterborough	3,550	12	2
Heath	3,530	10	0
Eggitt	3,511	3	0
Wilkinson, Wisbech	3,494	15	4
Bridgefoot, Peterborough ...	3,458	0	0
West, Wisbech	3,373	3	0
Shanks,* Chatteris	3,235	0	0

Rest of March.
***Accepted.**

Matlock Bath.—For erection of a pump room and pavilion, for the Matlock Bath and Scarthin Nick Urban District Council. Mr. Jno. Nuttall, M.S.A., architect, Matlock. Quantities by Mr. Fred. S. Smith, Grafton Street, Manchester.

S. and J. Whitehead	£11,932	0	0
T. C. Gluyas	10,519	0	0
G. Pillatt	10,418	0	0
J. Haynes	10,148	2	0
Evans Bros.	10,148	0	0
G. Longdon and Sons, Ltd. ...	10,050	0	0
Hallwood and Co., Ltd. ...	10,000	0	0
W. Walkerdine	9,974	0	0
W. Pattinson and Sons, Ltd.	9,731	0	0
Walker and Slater	9,600	0	0
Hughes and Stirling	9,533	0	0
G. W. Walker	9,392	0	0
T. Long	9,370	0	0
J. Dickenson	9,181	0	0
C. Griffiths	9,055	0	0
J. W. Wildgoose	8,999	0	0
W. Ford and Sons,* Derby ...	8,694	0	0

***Accepted.**

Middlesbrough.—For additions and alterations to North Ormesby Hospital. Messrs. J. M Bottomley, Son and Wellburn, architects, 28 and 30, Albert Road, Middlesborough.

G. P. Petch	£2,503	9	0
J. Davison	2,482	13	0
Vinter and Davison	2,433	12	0
J. E. Robson and Sons ...	2,432	17	7
H. McNaughton	2,292	18	3
G. Radge	2,263	0	0
Allison Bros.	2,250	0	0
P. Rhodes	2,237	0	0
W. A. King and Sons, North Ormesby	2,234	0	0

Penpont (Cornwall).—For the erection of a new china clay kiln, sheds, tanks, etc., also for taking out the earthwork for sidings at Penpont, in the parish of St. Breward, Cornwall, adjoining the London and South-Western Railway, near Wenford Bridge Station, for the directors of the North Cornwall China Clay Company, 1908, Ltd. Mr. T. H. Andrew, engineer, Market Hill, St. Austell.

Runnalls and Sons, Liskeard...	£4,990	0	0
Warne Bros., Bugle, St. Austell	4,535	0	0
W. T. Stevenson, Plymouth ...	4,490	0	0
W. E. Bennett, Bodwin ...	4,150	0	0
L. Jacob Bugle, St. Austell ...	3,799	0	0
Steer and Pearce, Plymouth ...	3,770	0	0
W. Nankivell and Sons,* St. Breward, Bodwin	3,695	0	0
Worth and Hawken	3,100	0	0
J. H. Pomroy, Ashburton, Devon	2,200	10	6

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Art and Mathematics. The discussion which followed the reading of Professor Hamlin's paper on "Architectural Education in America," before the R.I.B.A., brought out some interesting divergencies of opinion on the perennial subject of the education of the architect. Mr. T. G. Jackson expressed the somewhat unorthodox view that general culture is by no means a primary necessity for success in the profession of architecture. He contended that the artist is born, not made, and that no amount of learning could supply natural deficiency. That is obviously true enough as far as it goes; but the schools that are powerless to create genius are surely incapable of quenching it. Superlative genius is so rare that we cannot legislate for it, and so forceful that we need not. Yet surely genius has its degrees, its types, and its temperaments, and what would stimulate one type might stifle another; and we would gently hint that the somewhat outworn *nascitur non fit* theory may be easily pushed too far. Mr. Reginald Blomfield, on the other hand, confessed to a preference for the man of general culture—a view that has been consistently supported in these pages. Several of the speakers confessed—perhaps with a dangerous approach towards "the pride that apes humility,"—to a lack of the higher mathematics. But would Wren have been a better architect if he had been a worse mathematician? Professor Hamlin, in reply, vindicated very thoroughly the system of instruction that he had described. The two years' liberal education, he contended, were a necessary adjunct to the general equipment of the architect. The preliminary course, he contended, was contributory to the actual study of architecture; and in this sense it was an essential factor in the scholarly development of an enduring art. The necessity for mathematical training is doubtless greater in America than in this country, and we must admit that Mr. Jackson hit upon a truth when he hinted that there is certainly some disparity between the artistic and the mechanical mind, Wren's rather rare case notwithstanding. It seems probable that, in this country, in view of the growing adoption of American systems of construction, the American system of architectural education may be very profitably studied, and we are very grateful to Prof. Hamlin for the exposition of it that he has so clearly set before us.

A Matter of Business. We receive, through the post, by the telephone, and even by special messengers and personal visits, so many enquiries with respect to commodities, that a vast amount of time and trouble is expended in looking up the required data. So far as our readers are concerned, we do not complain. On the contrary, we are glad to be of service, and are indeed delighted to know that the journal is so generally esteemed for its practical helpfulness. Nevertheless, we feel bound to protest that much of the labour that thus devolves upon us would be rendered unnecessary if the vendors of the goods were more keen to keep them in evidence by means of constant advertising. It is quite clear to us that very much business is lost owing to this neglect; for it may be reasonably assumed that the enquirers who take the trouble to seek our aid in the search for a commodity that, ipso facto, is insufficiently advertised, represent only a fraction as compared with those who, from various causes—as urgency of requirement and dread of delay, or fear of troubling us in a matter concerning which our interest may not be clearly apparent—make no effort to obtain the particular goods they prefer, but adopt some more easily procurable substitute. Evidently, therefore, much custom is lost from lack of publicity. Upon our own position in the matter we do not wish to lay undue stress; but we must add that, while, on the one hand, we are very glad to be of service to subscribers, on the other hand we feel that it is not quite fair that we should be thus required to act as the unpaid agents of those traders who are so unbusinesslike as to make their goods a matter of enquiry and research. It is not simply a question of turning up a name in a directory. Very many enquiries refer to special lines with arbitrary names, registered or unregistered, and it is often very difficult, and in some quite impossible, to trace them. A typical instance is before us. A surveyor, in asking us to supply an address, states that he prices largely for builders, and is often at a loss for addresses where specialities may be obtained, because the vendors do not advertise. Surely, to allow good things to sink into obscurity in this deplorable fashion is to neglect one of the first principles of business. Constant and systematic publicity is, as all experience shows, essential to a full measure of prosperity, even when the commodity is of such approved value as to cause it to be sought for—often, as we have shown, in vain, because the vendors have allowed themselves to drop out of notice.

Nathan the Unwise. Municipal ideas on art are apt to be—very municipal, even though the municipality happens to be that of Rome, where, if anywhere, good taste might be supposed to reign supreme. The Mayor, Commendatore Nathan, however, is doing his best, or his worst, to correct that impression. He had put forward a scheme for uniting the three Capitoline palaces. It was unanimously rejected by the Supreme Council of Antiquities and Fine Arts, a body which, we are assured, is composed of all the leading archæologists and art critics of Italy. Their action is approved by almost the entire Roman press and people, who regard it as sacrilegious to tamper with the work of Michel Angelo. The Mayor, although his name is more suggestive of the meekness of Moses than of the obduracy of Pharaoh, has hardened his heart and let loose the vials of his wrath. It was he who recently gave a public warning to foreigners that they were not wanted in Rome if they dared to disagree with municipal ideas of beauty. He now heaps scorn on the Supreme Council, and declares that, in spite of it, he will carry out his fell purpose. In retort, he is warned that his action would be in direct contravention of the law of 1909—passed, apparently, not a moment too soon—for the preservation of historic and artistic monuments. The only question is whether the Capitoline palaces come under that head, and pending decision on this point, much irreparable damage may be done by a determined Bœotian of the type of Commendatore Nathan, who is surely not a descendant of Nathan the Wise. The conflict will be watched with considerable interest by those who are anticipating similar troubles with strong-minded municipalities in our own country as almost the first fruits of the Town Planning Act, which, at the outset, is pretty sure to be interpreted with more zeal than discretion. This lesson from Rome will not be lost on those who fail to see the necessity for strengthening the hands of the advisory committee that has been formed for the direction of town-planning reform into right channels. The Roman father (civic variety) is not unknown in this country, and his severities will have to be kept in check by some influential counteracting force.

Professional Tendering. The proposed erection of a small chapel at Cwmgorse, which, from internal evidence, would seem to be somewhere in Wales, is doubtless an insignificant matter in itself; but it happens that the terms in which the project is advertised favour a system to which architects strongly object. Tenders are invited for plans, specifications, quantities, and superintendence. Hence, it would appear that the status of the architect is either gravely misunderstood or coolly ignored. Architects, the good people of Cwmgorse should know, have a recognised scale of fees, and it seems, on the face of it, rather cynical to invite them to underbid each other. The tendering system, as we have said on former occasions, may possibly be justified in its application to practical building operations, in which the factors of the problem are many and diverse, in so far that, by more or less ingenious juggling with the permutations and combinations of men, materials, and methods, it may happen that one contractor, in particular circumstances—favouring sometimes one tradesman, sometimes another—may be able to do the work more cheaply than others, without injury to himself, his competitors, or the client. The professional man has no such scope for organisation and adjustment. Moreover, to a professional man, higgling and huckstering, and bargaining and bidding, are demoralising and abhorrent. Professional tendering, therefore, is not likely to flourish; but any instance in which it is sought to impose it is worthy of attention, in order that the matter may be more clearly understood, and the tendency thereby checked.

The Town-Planning Conference. The two days' conference on town planning, held at the Westminster Palace Hotel last week, under the very appropriate presidency of Alderman W. Thompson, of Richmond, did not make the mistake of attempting too much, and there was little or none of the vapid rhetoric that usually discounts the value of such meetings. The chairman made the very sensible suggestion that the ratepayers should, at the outset, pay for the best skilled advice available in arranging for the development of their towns. Alderman Bennett, of Warrington, was no doubt correct in his belief that even intelligent and well-informed people have at present only a vague and shadowy idea as to what town planning means, and that there is a good deal of apathy, ignorance, and obstinacy to overcome before the public can be expected to take kindly to ideals that are at present so new and strange. It is wise, therefore, in the Town Planning and Housing Council to inaugurate a campaign of popular education on the possibilities implied in the new Act, and to send round a well-qualified man to address citizens on the subject. Surely, however, one man is utterly insufficient. A score would scarcely suffice for the rapid conversion of the heathen, even supposing the additions of travelling vans and lantern slides. But we are glad to welcome even the smallest beginning of active missionary work. We are sure that it is sorely needed. Merely to overcome ignorance and prejudice is not enough. The public must be educated up to the point of appreciation of what is good, of discrimination and preference, before our essays in town planning can rise to any degree of dignity or beauty. A certain well-marked, pettifogging, and sordid spirit must be overcome, and the people taught to "think in millions," unless every project is to be ruined by the blight of petty parsimony; but the ascent to higher views must be carefully graduated. That large and liberal expenditure on worthy planning and building is money well invested is a gospel that, in these hard times, is likely to be scorned and scoffed at by the multitudinous disciples of Mr. Gradgrind, to whom cheapness and meanness are as cardinal virtues. The Act, we fear, reverses the usual order of things, and is rather in advance of the times; and the revolution in thought, habit and feeling necessary to its successful application can only be achieved by patient, persistent, and enlightened effort. The promoters of garden cities and suburbs, and improved industrial villages, have done noble pioneering work, without which the mere passing of the Bill would have been quite impossible. It remains to do in bulk what they have done in sample, and we should be glad to see some clearer indication of an effort to do it in the grand manner. Money and men are forthcoming for flooding the country with windy political propaganda; and yet it seems almost chimerical to suggest that a band of capable architects should be commissioned to deliver throughout the country, expository lectures on the infinitely more important subjects comprised in the Housing and Town Planning Act. It is a matter in which all the educational authorities in the country ought gladly to cooperate; and, indeed, the subject, giving practical application and combination of many educational items that are at present dealt with in detached and abstract ways—as geography, history, art, and hygiene—might, we think, be profitably introduced into the curricula of the schools. To come back to the conference and the advisory council, we are glad to think that the right direction has been taken; but we should be glad to see it pursued with greater boldness and aggressiveness; a meek and quiet spirit being ineffectual in these blatant times.

Correspondence.

The Editor declines responsibility for the statements made or opinions expressed by correspondents.]

Builders and the Budget.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In reference to the comments upon this subject in your issue of November 23rd, I should be much obliged if you will let your readers know the facts.

Soon after the Budget proposals were published it was considered that land and building development would be seriously affected by its provisions. Careful enquiries were made, letters were written to the Government, and cases quoted by many builders, and finally Mr. Edwin Evans, who is well known as an expert upon such matters, was consulted, with the result that meetings of builders and others interested were held all over London to explain and fully discuss the provisions as they seem to to affect the business above referred to.

Mr. Lloyd George himself was approached, and also the chief valuer at the Inland Revenue office, with the result that it became perfectly clear that both the dealings in land and the building of houses would receive a serious check, and the opportunities of obtaining capital so necessary to carry on the business would be practically closed. These fears were confirmed by many builders, who testified to the calling in of moneys hitherto at their disposal, and the impossibility of tapping fresh sources of supply.

It was found that in no cases since the Budget proposals were put forward had any increase in workmen employed taken place, but on the other hand the shrinkage in number was from 10 to 80 per cent., or on an average something like 35 per cent. whilst no builder could be found who had been bold enough to purchase any fresh stock of building land during the whole of this time. In consequence a private meeting was called on November 17th, at Anderton's Hotel to consider what steps should be taken, at which I had the honour to be called to the chair. This is the meeting referred to in your article, and at which the suggestion of a Federation of master builders and workers was made. Your readers will see it was merely the suggestion made at a first meeting. Since this two or three further meetings have been held, and if you will allow me the privilege, I hope shortly to report to you a movement which I venture to think will be of the greatest importance to the building industry, and which will in no way clash with the National Federation of Building Trades Employers of Great Britain, or any other such useful association.

What our provisional committee desire is to form an association of those more particularly interested in building development. We are quite sure that had the interest of this particular industry been backed by a strong association of those engaged in it, the land clauses as now drawn would never have received the sanction of either the Liberal or Labour Party in Parliament.

I enclose for your perusal a rough proof of a short pamphlet we are issuing.

Yours truly,
H. R. SELLEY.

TWO NOTEWORTHY EXAMPLES

We think that many of our readers will be specially interested in two noteworthy announcements which appear in the advertisement columns of this week's issue. An eminent firm of manufacturers, desiring to erect a large dining hall, which may also serve for concerts, invites the assistance of an architect who has had experience in such work. This is a rather refreshing departure from the usual method of promoting a competition, and it seems to us to be a more certain means of discovering the right man to do the work.

We hope that this example may be followed by many public bodies and building owners. However small a building may be, apparently it is thought correct to promote a competition as the sure way of obtaining a cheap and efficient building. We shall welcome other similar advertisements, and we feel sure professional men throughout the country are in this respect in agreement with us. In another instance a prominent firm of engineers invite applications for a highly responsible position in their drawing office.

Messrs. Walter Lawrence and Son, building contractors, of Canal Works, Waltham Cross and Moselle Works, Tottenham, have removed their head office to 21, Finsbury Circus, London, E.C., where all communications should now be addressed.

* * *

A fire broke out last week at Birmingham Small Arms Factory, which is one of the largest manufacturing concerns in Birmingham. The whole of the fire brigade turned out. The first started in the stationery department—a range of buildings covering an acre and a half. In the same building many thousands of parts of unfinished cycles are stored. The whole of the roof of the stationery department and warehouses was gutted, and damage to the extent of several thousands of pounds was done. The lower rooms, in which cycle components were stored, were filled with water. About 2,000 men are employed at the factory, but it is hoped there will be only a temporary interference with the work.

ARCHITECTURAL EDUCATION IN AMERICA.*

By Professor A. D. F. Hamlin.

The Centennial Exhibition in 1876 at Philadelphia was to two or three millions of people a revelation of the beauties and possibilities of the arts, especially of the industrial and decorative arts. Out of this movement grew such great architectural schools as those of Columbia University and the University of Pennsylvania.

The return of peace in 1865 had been followed by a sudden awakening, especially in mining and the development of railway building and manufactures in the west. This led to the establishment of numerous technical schools, following the lead of Columbia College, which had even in the midst of the war established its school of mines in 1863. The great Massachusetts Institute of Technology was opened at Boston shortly after that date —I think in 1866. At any rate, in that year Professor William R. Ware, then practising in Boston, was charged to study in Paris the system and methods of the department of architecture of the Ecole des Beaux-Arts, with a view to obtaining data and suggestions for a similar department to be created by the Massachusetts Institute. Mr. Ware fulfilled this commission, and the new department was opened in September of that year, with Mr. Ware as its professor of architecture and director. Shortly afterward M. Eugène Létang was invited from Paris to become the instructor in design. This department was placed under the direction of an accomplished scholar, Charles Babcock. A year or two later the State Industrial University of Illinois at Champaign, in that State, followed the example of Cornell, opening a department of architecture under the direction of Professor N. Clifford Ricker. It is a striking evidence of the youth of the American system of architectural school education that the three founders of these first three American schools are at this writing still living, so far at least as I am at present informed. Thus, at the time when the Philadelphia Exhibition marked the close of the Civil War epoch, and ushered in the American Renaissance, there were in the United States three well-established schools of architecture, and these were the only organised and publicly recognised means for obtaining a professional training in architecture. [Professor Hamlin then gave an interesting résumé of the history of American architecture, the main facts of which have been recently dealt with in this journal.]

Of all the Continental European Schools to which Professor Ware might turn for suggestions the great Ecole at Paris was the only one that promised practical results. M. Eugène Létang was called to the new post, which he filled for well-nigh twenty years. The Boston School acquired a high reputation, which it has maintained ever since, in spite of the multiplication of large and well-equipped schools throughout the country. After the death of M. Letang there followed a period during which the school lost somewhat of its pre-eminence in the matter of design; but in 1892 or 1893 M. Despradelle was called from Paris to the chair of design, which he has ever since filled with conspicuous success.

The school at Cornell University and that of the Illinois State University at Champaign, Ill., paid less attention to design and to the artistic side of the course, and more to the practical and engineering sides.

In 1881 Professor Ware was invited by the Trustees of Columbia College in the city of New York—the institution founded as King's College under a charter from George II. in 1754, and which has since developed into the great Columbia University—to undertake the organisation and conduct of a department of architecture, upon the same general lines as that which had achieved such distinguished success under his guidance in Boston. The invitation was accepted, and the new school was opened in 1881 with four students. The department of architecture, developed into a distinct school of architecture, though under the Faculty of Applied Science of the reorganised university, was in 1902 made an independent school, with a view to its later incorporation into a proposed Faculty of Fine Arts. This latest stage of its development was accomplished in 1906.

The present organisation of the course recognises three classes of students: first, those who aspire to the highest achievement in the profession, and to that end seek for a broad foundation of liberal culture through non-architectural studies before taking up their strictly professional courses; secondly, those who, without this broader foundation, desire to pursue a "systematic course of architectural study for three or four years, and to receive a definite academic recognition of their attainment; and, finally, young men, already more or less experienced as draftsmen in the profession, who desire to pursue special studies in architecture, while unable to afford the time or expense of the complete curriculum.

The curriculum leading to the degree of Bachelor of Architecture comprises the following groups of studies:—(*a*) Mathematics and engineering (analytical geometry, plane trigonometry, the differential and integral calculus, mechanics, graphical statics), and architectural engineering — a specialised course in strength of materials, and the calculations for masonry, columns, beams, and trussed constructions, with specific problems to be worked out in full; (*b*) architectural history, including a three years' course in the history of architecture and the history of ornament, with at least one year of readings in archæology and architectural history in French or German; (*c*) office-work and specifications comprising parallel causes in the materials and forms of building and in specifications, and a certain amount of certified work in architects' offices; (*d*) drawing and modelling exercises, occupying from six to ten hours per week through the entire period of study, in architectural draughting, modelling in plasticine, and free-hand drawing from elementary cast, drawing to life, drawing from the nude, and including a considerable amount of training in architectural water-colours; (*e*) graphics, advanced shades and shadows, perspective, descriptive geometry and stereotomy; and finally (*f*) design, considered as the crowning feature of the course, the end and aim to which all other branches pursued are contributory. This course comprises lectures on the theory of planning, composition, colour, and decoration, and a graded series of problems beginning early in the first year of study, and extending to the end of the course, culminating in the graduating thesis—the design of a building upon a programme selected by the student, and upon which he prepares a fairly complete set of scale working drawings and specifications, with strain-sheets, calculations, and structural details of a given part of the edifice.

After many years of experiment, the system followed in the Columbia University School has shaped itself in the following manner. The newly-entered student, already possessed of some slight acquaintance with the Orders and of the elements of drafting, is for three or four months subjected to a further drill in these subjects, in order to be able to express himself with some freedom in architectural form. The Orders are not treated as the sole language or the sole alphabet of the art, but simply as *one* form of architectural expression, and are carefully and thoroughly studied at the outset because there can be no free expression until one has mastered some one medium of expression. The remainder of the first year is then devoted to exercises in composing simple architectural structures with these elements: gateways, porches, vestibules, pavilions, and the like being the subjects assigned. The designs, carefully rendered with all shadows cast in Indian ink, are handed in at a given time, and criticised and judged by some member of the school staff. Upon the completion of a sufficient number of these introductory exercises—usually at the opening of the second year—the student is admitted to the lowest grade in the regular school competitions in design. There are three of these grades—the elementary, intermediate, and advanced. In each of these grades there are from five to seven or eight major problems given out during the academic year, and as many minor or sketch problems, the former requiring each from three to seven weeks for their completion; the latter one day only. The programmes for these problems are prepared by a committee consisting of the six teachers and honorary professors of design, who administer the three *ateliers* or draughting-rooms maintained by the University. The programmes are given out on a day set in the calendar, and the designs must be handed in on another set day, or they are not received at all. Shortly after this they are hung in

RUTHRIESTON ELEMENTARY SCHOOL, ABERDEEN. J. A. O. ALLAN, ARCHITECT.

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*Abstract of a paper read before the Royal Institute of British Architects, Monday, December 13th.

a suitable exhibition hall, and judged by a jury consisting partly of members of the committee and partly of practising architects invited *ad hoc*.

In style and scale as to drawing and presentation, the designs of the two higher grades somewhat resemble those ordinarily seen at the Ecole des Beaux-Arts Exhibitions of current work, and are of fully equal average quality. But the tendency is away from imitation of Parisian models; more attention is paid to composition and proportion, less to mere draughtsmanship, and the problems, while selected to give full scope to artistic expression, are all more or less practical and American in character.

The brilliant reputation of the Paris school, the fifty years' tradition of the advantages for American students ever since the days of Hunt and Richardson, the influence of the Beaux-Arts Society and its competitions, and the glamour of the affixed title of *Diplômé de l'Ecole des Beaux-Arts*, all tend to draw Pariswards the young American graduate who desires to visit the Old World or to acquire further discipline in design. But the Columbia University School seeks to discountenance the waste of time and duplication of work already done, involved in acquiring the Paris Ecole *diplôme*.

The Society of Beaux-Arts Architects of America numbers now some two or three hundred members scattered through the Union, and including some of the most distinguished of the younger and middle-aged architects. Its very active committee on education issues each year, according to a carefully prepared calendar, two classes of problems, each comprising seven or eight major problems and as many *esquisse-esquisses* or one-day sketches. The printed programmes for these are given out on a set day at a dozen or more centres in different cities, under a representative, in each place, of the Society, who gathers the sketches (the competitors retaining tracings of them) and sends them to the New York office. Anyone may compete; the majority of those availing themselves of the privilege being young draftsmen in the offices, who work upon the designs at night, in *ateliers* conducted by themselves under the direction of a patron or critic belonging to the Society. A select jury judges each set of designs, awarding medals and graded mentions, and the highest premiated designs are published in one or more periodicals.

Discussion.

Mr. T. G. Jackson, R.A., in opening the discussion, thanked Professor Hamlin for his extremely clear account of architectural development in America. It appeared that in their colleges there were three distinct courses in operation—A, leading to a diploma in architecture; B, leading to a certificate, no degree being conferred; and C, a general training for men who, perhaps without the intention of turning their knowledge to account, wished to know something of the art of architecture. Continuing, Mr. Jackson observed that too much stress was laid upon the necessity for general culture. General culture was one thing, and architectural education quite another. English architects sometimes, in the manner of the Americans, went to a University, and afterwards applied themselves to the study of architecture. In the first instance, however, he thought it was mixing up two distinct things to try, by a fictitious pretension, to give what was deemed necessary for the students' general cultivation. Class B, it appeared, was more exclusively professional and less of the character of a liberal education. He was the last to deplore general culture. The more the knowledge the greater the usefulness. General culture could never make a man an artist. If they looked at the careers of many of the greatest artists they would find that in a large number of instances they had risen from the ranks. And the same applied to architects. If he was not mistaken, many philosophers were slaves. And when they came to look at the masterpieces of mediæval art, they would find that they were the productions mostly of illiterate men. By attaching such great importance to a scheme of general culture, they were doing no good. They might look, he thought, for better architects among the men with no scholastic decoration. There appeared also to be more stress laid upon mere technicalities than on design. He confessed that his own mathematics did not go beyond the first four rules. People had considerately prepared excellent tables which were quite sufficient for the purpose when mathematics were in demand. Any matter referring to, for instance, heating, ventilation, drainage, or electric lighting should be exclusively the province of the engineer. These matters were so much beyond architectural training, that probably if the architect attended to them himself they would be done very badly. It was not necessary, therefore, to go to the extent which the curriculum imposed. They all realised the difficulty of the American students; they had no old buildings in their own country. Although it was true that all styles were essentially developed from the old ones, and that no style ever came into the world fully equipped, it had often occurred to him that the Americans had valuable opportunities to shut the book of the old country, with its catalogue of examples, and to attempt to evolve a style free from the influence that the study of old work must necessarily hold. It had given him great pleasure to listen to the very interesting lecture of Professor Hamlin.

Mr. Reginald Blomfield observed that it showed how important this matter had become, when Mr. Jackson came down and gave them the benefit of his opinions on educational matters. They had it on the authority of Ictinus, he believed, that in the middle ages architects were extremely well educated men. Regarding the distinction between general and technical education, he believed that in America the former was of necessity preliminary to the latter. This involved a practical point. He personally would infinitely prefer to have in his office the man who had gone through the schools. The well-trained mind was preferable to the ill-trained. The American system of education was unquestionably based upon the Ecole des Beaux Arts. The Blondel method was, if they troubled to examine it, on all fours with that of Professor Hamlin. In times gone by more importance had been attached to draughtsmanship than to architecture. Apprenticeship had not, he believed, taken well in America. The training in an architect's office afforded by the sytem of apprenticeship, was, he thought, going out of fashion even in this country. He would sacrifice the training to be gained in schools rather than give up the training of the office. Concluding, Mr. Blomfield said that he seriously doubted whether England would ever be able to build up systematic architectural education as France had done, and as America would undoubtedly do.

Mr. John W. Simpson said that the delightful task of proposing the vote of thanks to Professor Hamlin had fallen to him. All art, he proceeded, was founded upon tradition. The difference between a race with established schools, and one without them was, that the former learnt by tradition, and the latter fought for itself. Professor Hamlin's regard for the year 1866 as of much antiquity reminded him of what a lady had recently said—the youthfulness of the Americans was one of their oldest traditions.

Professor C. H. Reilly observed that he had had the pleasure of visiting the schools of America during his recent visit, and he had been greatly impressed by what he had seen. What had struck him most of all was the enormous improvement of American architecture during the last decade. At Cornell University he had been surprised to find students working at 10 o'clock at night, and obviously engrossed in their work. These same students were in attendance at a lecture delivered at 7 o'clock the next morning. Mr. Reilly accounted for students' enthusiasm by the fact that opportunities were afforded them of carrying out monumental architecture.

Mr. H. H. Statham said that in the old Colonial houses they saw the classic style transformed by the influence of timber. In the modern work he had felt for a long time that there was far too much Ecole des Beaux Arts. For many years he had been in the habit of going to the Salon, and it always seemed to him that they had all Ecole, with but little or no individuality. He personally had no mathematics; and he regretted the want every day. When they came to details, such as drainage, electric lighting, etc., they should, he thought, know sufficient of the principles to tell whether they got the right thing.

Professor Elsey Smith said he wished to tell Professor Hamlin that they did not all agree with the sentiments of some of the previous speakers with regard to general education. Columbia University undoubtedly took the lead by insisting that all its students should go through a two years' course of general culture. In no country, with the exception, perhaps, of Germany, was education so well understood as in America; and he was quite willing to confess that he agreed to every point in the curriculum which the students were to follow. He hoped to see students entering for a course of study for four years instead of for two, as now.

Professor Hamlin, responding to the vote of thanks, said that he did not think the respective problems of education had been muddled. The two years' general education were required before the actual process of education in the profession of architecture began. It had been said that general culture would never make an artist. Perhaps so; but the man who had artistic fire in him would be immeasurably the better by his culture, and would make an infinitely better architect than the man who, deprived of that culture, possessed but ordinary training. In New York, mathematics were rendered a necessity by the new forms of high building. Architects had new problems to solve, to prepare adequately for excessive wind pressure; and a knowledge of mathematics was the only safeguard. These problems would sooner be trusted to men with a diploma than to men with a certificate, for solution. Englishmen took to themselves, somewhat selfishly, the traditions of the past, and expected a new land to perform impossibilities. Would they remember Shakespeare was as much theirs as ours; that precedent was as much theirs as ours? It was inherited in the blood, and could no more be ignored than could the language. It was impossible to produce architecture without tradition. No architecture could ever be created of itself.' Their resolve was not to be slaves to precedent, but to awake to the opportunities afforded by a new land. He very heartily thanked them for their kind reception of a brother from across the sea.

Messrs. Smith, Major, and Stevens, Ltd., have just been instructed by the Lords Commissioners of the Admiralty to supply and erect on board the new Dreadnought Battleship, H.M.S. "Neptune," four of their electric passenger lifts, the order having been obtained after an exhaustive enquiry into the merits of the lifts in question.

* * *

A lecture on "The Story of Fountains Abbey" was given at the Leeds Institute by Mr. Thomas W. Thornton, who lamented that so little was known of the craftsmen who built the great cathedrals and abbeys of churches of the great Gothic period. It was true, he said, that the buildings were devised by master-minds, but the details were carried out by men who knew their craft, who were not mere machine-minders, but men with minds to conceive and ability to construct the beautiful fabrics which, after eight centuries, were still the admiration of mankind.

NOTES ON DECORATION.

By Arthur Seymour Jennings.

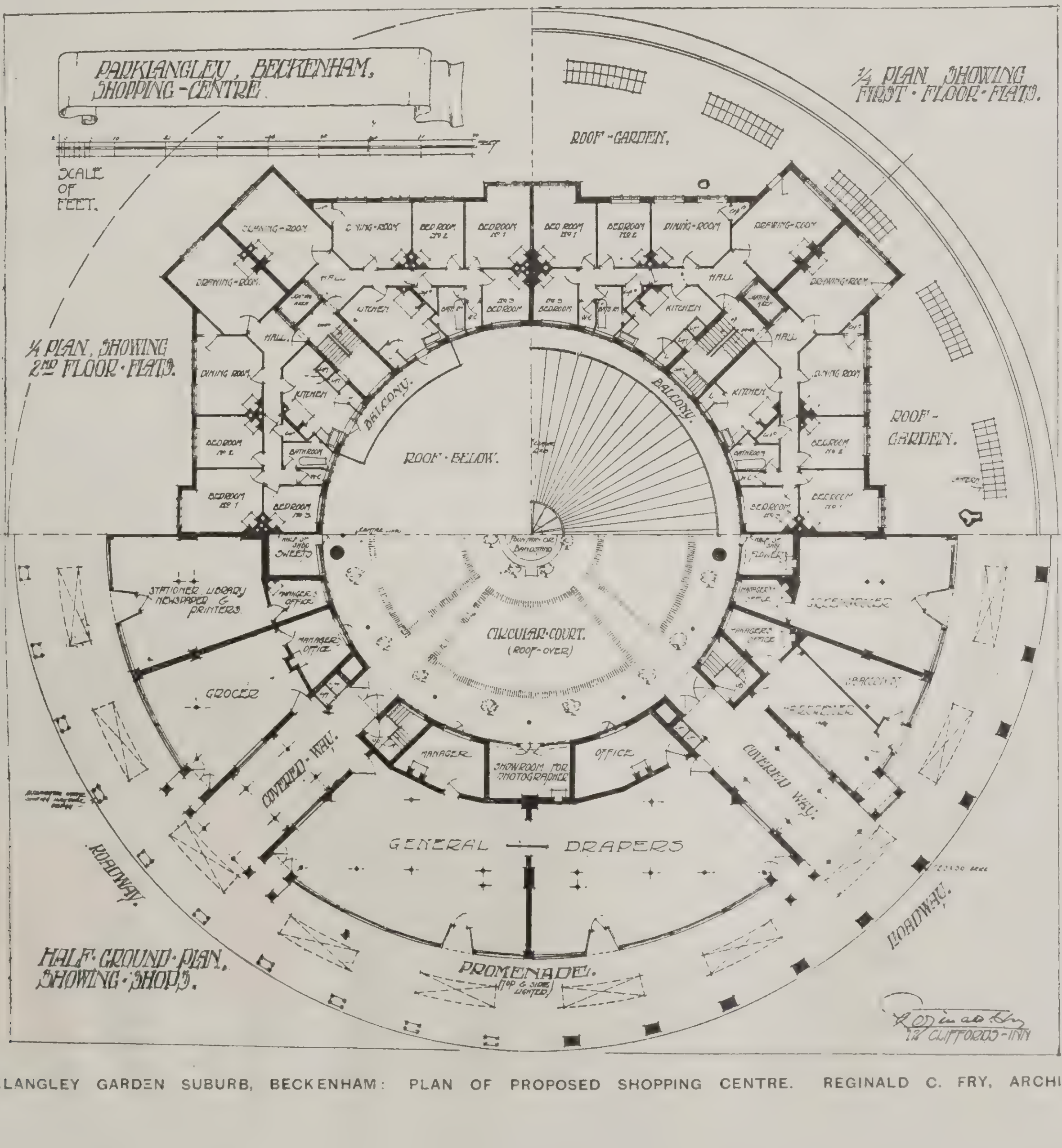
A question which often arises among architects and builders is as to how varnish may be practically tested with a view of discovering its probable durability. Some people seem to imagine that analysis will give important data upon which to work, but this is entirely a mistake. Analysis in the case of paints, if properly read, will yield facts upon which one can determine to some extent the probability of the paint lasting when exposed to the elements. But in the case of varnish analysis is almost useless, excepting that it may indicate the presence of resin, but this can be ascertained without the use of chemistry at all. If a varnished surface when dry is kept wet for a few hours, white milky spots will appear if the varnish contains resin. The usual and simplest plan is to charge a sponge with water and allow it to remain on the varnish surface overnight.

How, then, it will be asked, can one test varnishes? Is there no plan by which at least some reasonable probability of the lasting value of the sample may be ascertained?

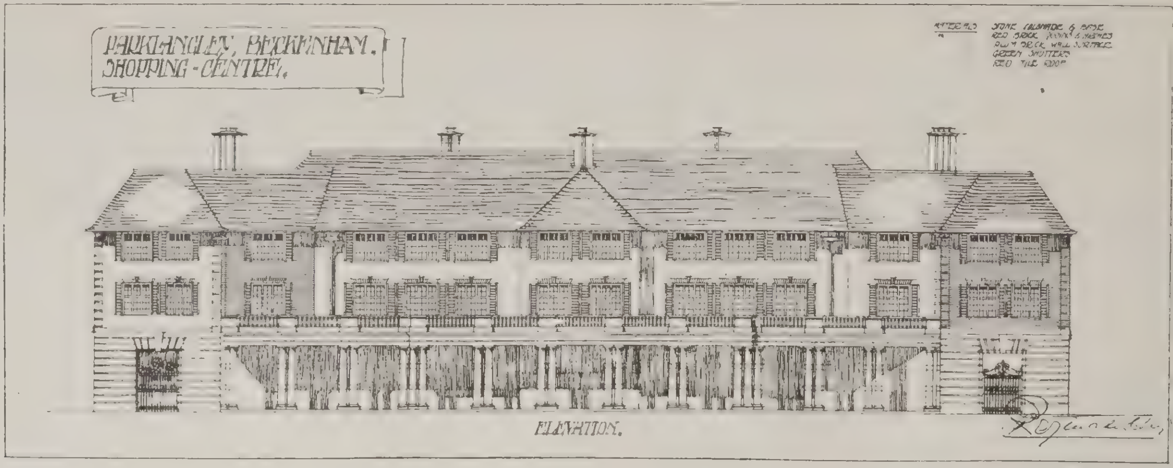
The answer is, yes, with a reservation that there is no method which can be looked upon as absolutely accurate. Of course, the price at which a varnish is sold or the name of the manufacturer in ordinary practice should satisfy one to a great extent as to what the quality of a varnish is likely to be. But we will assume that say ten samples of oil varnishes are submitted to test without any indication as to their value, or to the name of their manufacturer. We will assume, further, that they are put up in small bottles. In such a case the first thing to be done would be to examine each varnish for clearness. This does not mean colour, as a light varnish is only more valuable than a dark one when it is to be applied over light work. In other cases the lightness or darkness is not important. In examining, however, the ten samples, we shall probably find that two or three of them will be more or less cloudy or torpid, and these should be rejected, as in all probability they had not been properly tanked, and stored.

And here it may be useful to break off from our experiments for a moment to consider what a varnish is. By "varnish" is meant one prepared from oil or turpentine, and not a spirit varnish. Ordinary oil varnishes are made by dissolving with aid of heat certain resins or gum resins in linseed oil. The essentials are that they shall be in sufficiently liquid form to admit of application by means of an ordinary brush, that they shall dry hard and lustrous, and that the brilliancy shall remain more or less permanent. The actual resins, or gums, as they are frequently called, employed vary very largely in character, the hardest being such gums as Zanzibar, copal, the medium such gums as Kauri, and the soft those obtained from Brazil, Borneo, and other parts. Frequently, a mixture of gums is effected. But without going into the technology of varnish manufacture, it should be explained that in the case of every oil varnish, it is essential that the product be kept for a considerable time, say one or two years at least, in a tank placed in a room, which is kept night and day at a uniform temperature. This has the effect of causing the "foots" or impurities to settle to the bottom, and the varnish being drawn off at some distance up the tank, the foots or sediment are left at the bottom, and are afterwards drawn off for other purposes. The maturing of varnish in this manner has unquestionably a very material bearing upon its brilliancy and durability, but as obviously it locks up a good deal of money, there are not a few varnishes placed on the market which are so new that they quickly perish. There are no recorded experiments of any very definite nature that bear on this interesting part of varnish making and varnishing, but it may be taken as a broad fact that even a well-made varnish produced from copal is not so durable as one which is made of slightly inferior materials, but which has been thoroughly well matured. New wine, new whisky, and new varnish are therefore to be severely left alone.

To return to our experiments. It is always advisable in testing all kinds of materials to endeavour as far as possible to reproduce the conditions which exist in the actual work for which those materials are intended. Assuming that we have six good clear samples to test, one against the other, the following plan may be carried out. Take a ten-inch board,



PARKLANGLEY GARDEN SUBURB, BECKENHAM: PLAN OF PROPOSED SHOPPING CENTRE. REGINALD C. FRY, ARCHITECT.



PARKLANGLEY GARDEN SUBURB: ALTERNATIVE ELEVATION FOR PROPOSED SHOPPING CENTRE. REGINALD C. FRY, ARCHITECT.

say six feet long, mark off a space three inches wide from end to end, and divide the remainder of the board into six equal parts. Number each of them one, two, three, and so on. Then number each bottle with corresponding numerals. Prime and paint the board with three coats, omitting red lead altogether, as this is very destructive to even the best varnish. Take care to rub down carefully between each coat, so that the finished surface is quite smooth and clean. If the divisions have become obliterated it will be necessary to mark them in pencil again on the finished surface. Now obtain a sample of a really first-class varnish of some well-known maker, paying at least a guinea a gallon for it, and varnish the surface of the three-inch space which runs from end to end. Then varnish each space separately with number one, number two, and so on, taking care, of course, not to mix the samples. The usual plan in making these tests is to place the board on a table or bench, but this is perhaps a little misleading, as most work that is varnished is in an upright position, such, for example, as the case of a door, and it is better to place a board leaning against a wall so as to reproduce the actual condition of varnishing as nearly as possible. This work should be done in a room free from dust, and one heated at about 60 degs. F. A dry day is the most favourable for success. At the end of two or three days all of the varnishes should have dried quite hard, but it will be useful between to note the actual condition of each, so as to ascertain which is the quickest and which is the slowest drier. Speaking generally, it may be said that the quicker a varnish dries the less durable it is likely to be. But this rule must not be enforced too rigidly. When dry, the various specimens should be scratched across, when the toughness, hardness, and brittleness will become to some extent apparent. If the surface breaks up under the scratch of a sharp point with a ragged, uneven edge, the varnish is probably poor. If it gives an even and firm scratch the probability is that it is good. In other words, the varnish should almost scratch like one would expect a tough piece of leather would do. The different results obtained by scratching the different samples of varnish, as compared with the standard, will yield a good deal of valuable information as regards the relative qualities of the different samples. Possibly the reader has at hand one of the cheap roll-top American desks. Let him scratch this, and he will almost always find that the surface is very brittle and the scratch ragged, the reason being that cheap resin varnish is usually employed for these desks.

Professor A. P. Laurie, the Principal of Heriot-Watt College at Edinburgh, some time since patented an apparatus for testing varnishes, which consists simply of an appliance for scratching. It comprises a blunt point, which is pressed down upon the dried film of varnish to be tested, the pressure being regulated by means of a spring and a screw. The varish in this case is applied to the surface of glass, and the scratches give valuable information concerning the qualities of the different varnishes experimented with.

Of course, the very best test that can be applied is that of actual exposure, and a board with its six samples and its standard, making the seventh, after being scratched in the manner described, should be exposed by being nailed to a wall. If a careful record is kept of the condition, say at the end of each month, for two or three years, of the different samples as to their brilliancy, we shall have some useful facts upon which to work. In a London atmosphere the soot and dirt accumulate so quickly that it is advisable on each occasion when examining the samples to lightly wash down the surface with a chamois leather dipped in lukewarm water, and then to lightly polish with a dry chamois leather. If architects, painters, and builders would only take the trouble to make such experiments as those above described, they would find it of considerable service to themselves as well as to their clients and customers.

HOW TO PREVENT ACCIDENTS.

For the prevention of accidents, a builder is almost entirely in the hands of his foreman. Some foremen are considered "lucky" because no serious disaster happens on works under their control. It is probable, however, that luck has little to do with their good record, which is really based on their more complete understanding as to what constitutes danger and dangerous procedure. Believing that the extension of such knowledge would be a boon to the trade, we purpose giving from time to time an account of a typical accident with suggested means of prevention.

A flooring of steel joists had been fixed but not filled in. The workmen to cross it had a run laid two boards wide. It was shaped as the letter T. In other places floor boards were laid loosely, and in some cases singly. One of these was placed close to an angle formed by the run (see illustration). A workman using the run with a load, found his way impeded by a stanchion. He incautiously stepped from the run on to the loose flooring board, which broke under him, and he fell.

Rule.—Runs should be of sufficient width and well defined.

Skylights in roofs are a regular source of danger to workmen engaged in their repair. This is increased in such cases where the premises are old and the framework of the light is of wood. Three typical accidents will illustrate the dangers.

The first happened to a man who was repairing a zinc guttering at the bottom of the light. He was confined as to space and incautiously placed one foot on the light. It gave way and he fell and was killed.

The second accident occurred to a man who was reputtying the sash. He used one board for support. It slipped, throwing him on to the light, through which he went and was fatally injured.

The third case was somewhat different. The man was proceeding to his work by way of a duck run when he tripped, and the skylight on which he fell, failed to support him. Fortunately the result was not fatal.

Rule. Skylights being generally of light construction, should be sufficiently boarded over when near to men who are working or passing to their work.

Painters' trestles and steps at all times form insecure supports to carry boards for men to work from.

The danger is added to when the trestles or steps are improperly fixed. Often this is difficult, as, for instance, when they stand on landings or stairs. Compared with their height, the area of the base is often small, and the work of a painter or plasterer generally necessitates the use of some force which tends to overturn them.

A fatal accident is known which occurred from this cause. On two quarter-space landings with a short flight of steps between them, two pairs of steps were stood to carry the necessary boards. They were not opened out, but leant against the wall. The man on the platform in his work pushed one pair of steps over and he fell.

Rule. When the trestles or steps cannot be fully opened out to give the most secure base, they should be fixed at the top or otherwise prevented from moving.

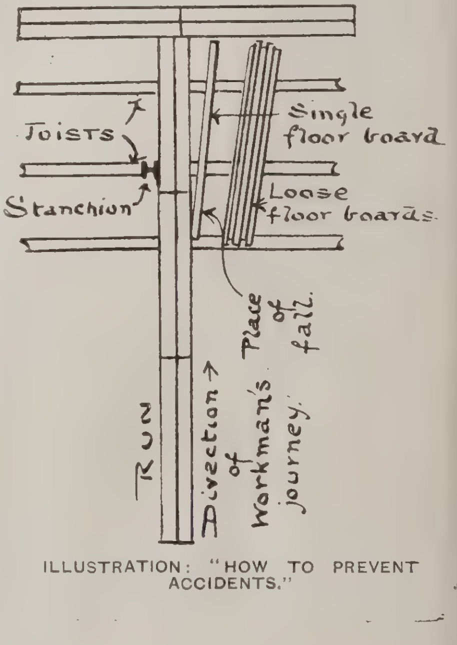


ILLUSTRATION: "HOW TO PREVENT ACCIDENTS."

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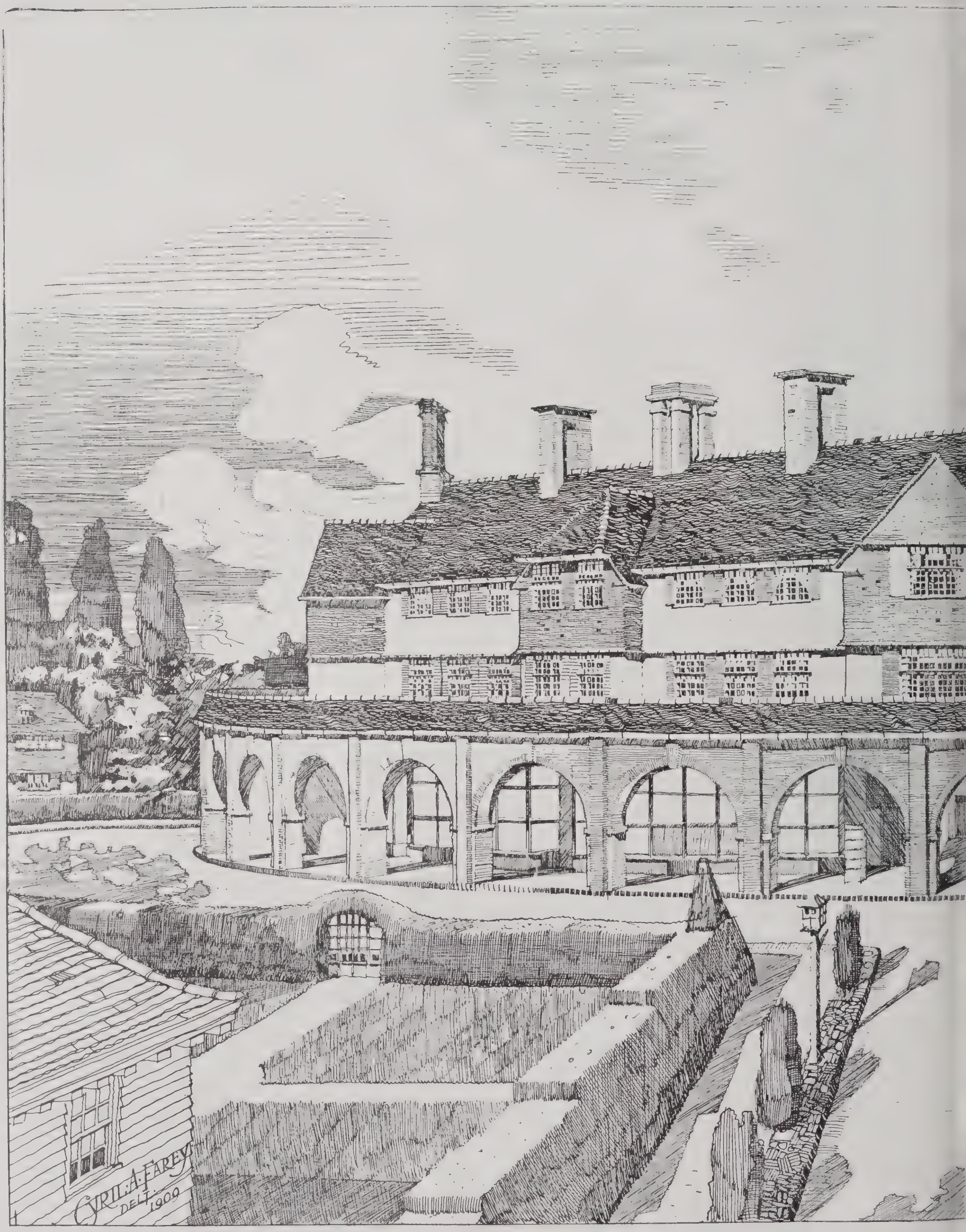
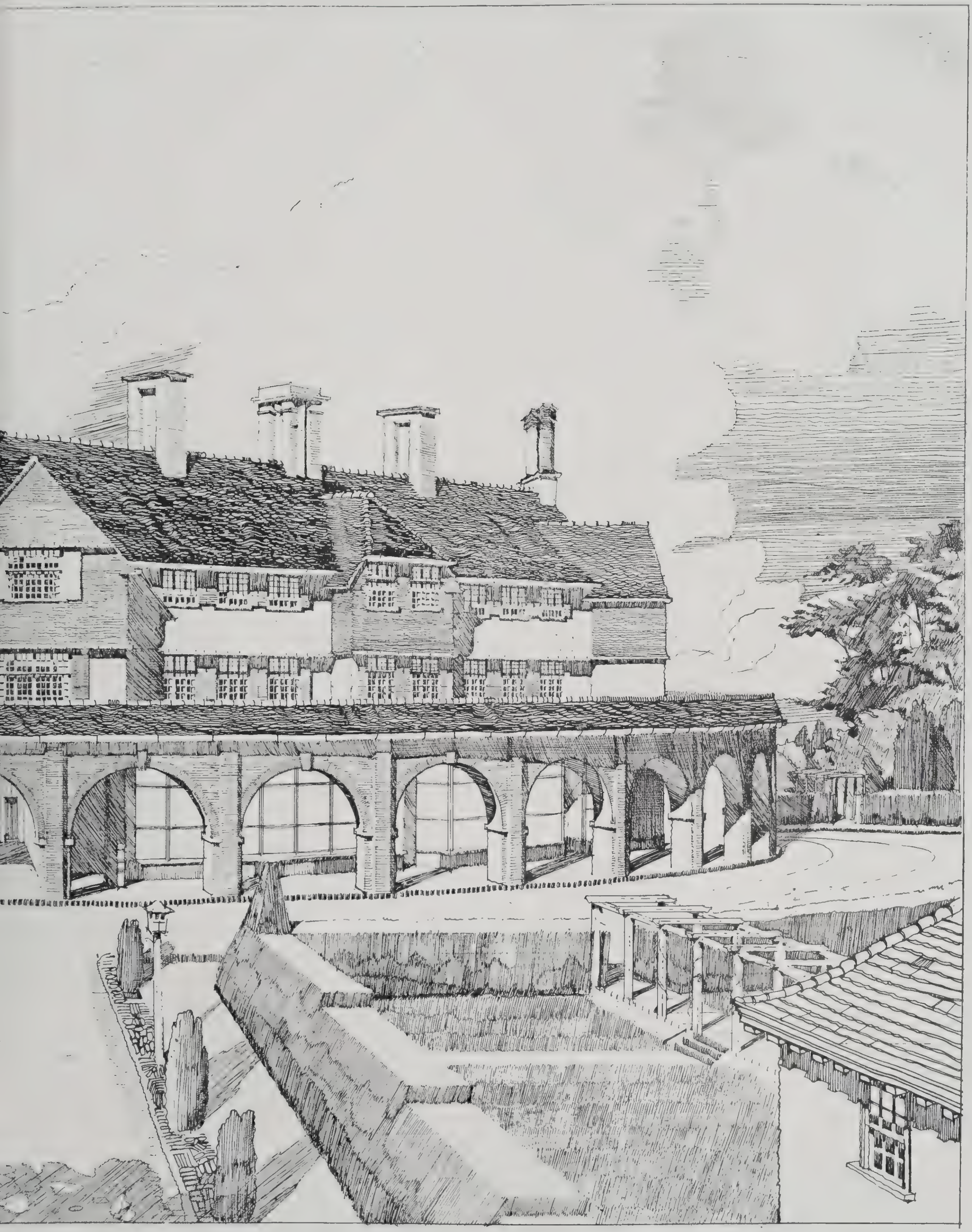


PROPOSED SHOPPING CENTRE, PARKLA


REGINALD . C . FRY ARCHITECT 12 CLIFFORDS INN E.C.

ARDEN SUBURB, BECKENHAM, KENT.

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Proposed New Works.

ABERDEEN.—It is proposed to erect a new theatre at the corner of Carmelite and Guild Streets, Aberdeen. The decoration is to be carried out in fibrous plaster, and the outside mason work will be in granite.

BALLYMONEY, IRELAND.—The Town Council have received a letter from the General Post Office, London, stating that, although there are several difficulties to be overcome, there is every probability of the proposal to build a new post office being carried into effect.

BOURNEMOUTH.—A L.G.Board enquiry has been held at Bournemouth into the application of the Town Council to borrow £77,000 for the erection of a pavilion, reading, and assembly rooms, etc., on the site of the Belle Vue and Pier Hotel, and upon land forming part of the Central Pleasure Gardens. In a letter to the L.G. Board, the local residents' Association submit that the Council should curtail expenditure.

BURY.—A L.G. Board enquiry was recently held into the application of the Corporation to borrow £15,500 for the purpose of a scheme for the erection of working-class dwellings. It is proposed to erect fifty-two houses to let at rents ranging from 4s. 4d. to 6s. 3d. per week. Evidence was given to the effect that at present there were only two working-class houses in Bury unoccupied, and that the proposed scheme would do away with overcrowding. The Master Builders' Association contended that they could meet the demand if given the same terms as the Corporation by the ground landlord.

DERBY.—An application has been made to the Derby licensing justices for a music and dancing licence for the proposed Hippodrome at the corner of Green Lane and Macklin Street, the plans of which have been approved by the Improvement and Construction Committee of the Corporation. The building, which is estimated to cost £15,000, will have accommodation for 1,900 persons. An advantage to the town will be in the widening of Macklin Street, as the promoters are giving up land to the value of £1,000 for that purpose. The decision has been deferred.

DUBLIN.—The Chief Engineering Inspector to the L.G.B. has held an enquiry relative to the proposal of the City Council to reduce the rents charged in respect of stalls in the Iveagh Market, Francis Street. The enquiry was also concerned with the application of the Corporation for sanction of the following loans:—1, £8,200 for the completion of the Bride's Alley area scheme under the Housing of the Working Classes Act and 2, £10,000 for the widening and repairing of Annesley Bridge.

EDINBURGH.—In the City Chambers, Edinburgh, recently, a private meeting of ladies and gentlemen was held, under the chairmanship of the Lord Provost, to consider a proposal to establish in Edinburgh a hospital for the treatment of diseases peculiar to women. A vote taken at the conclusion of the meeting was unanimously in favour of the scheme.

HARROGATE.—It is proposed to erect a new hydropathic establishment on the St. James's Park estate. The dining-room, it is estimated, will seat 300 people, and besides this there will be a smaller one for use in winter, together with drawing, reading, billiard, and recreation rooms, and a large lounge in the centre of the building. The main frontage will be to the south and the entrance at the north side of the building, which will extend some 350ft. Baths of an up-to-date character will be erected in the basement, and include Turkish, Russian, and plunge baths, and electrical facilities. The men servants of the establishment will also have accommodation here, and an up-to-date laundry and other conveniences will be provided. The grounds will be elaborately laid out by Messrs. Cheal and Sons, of Crawley and London, and a terrace will grace the south frontage of a considerable width. Mr. S. Stead, of Harrogate (late borough surveyor) is the architect.

HENGOED.—A L.G.B. enquiry has been held here to enquire into the application of the Gelligaer U.D. Council for a loan of £11,408 to erect an isolation hospital.

HOUNSLOW.—In a competitive scheme for a proposed new undenominational church and schools at Hounslow, the designs submitted by Mr. J. W. Winter, St. Peter's Close, Sheffield, have been selected. Mr. Winter has received instructions to supervise the erection of the buildings in accordance with his plans and quantities. About a dozen London architects competed. The scheme is estimated to cost about £3,000.

INVERURIE.—A new Carnegie library is to be built here from the designs of Mr. Maclennan, of Messrs. Jenkins and Marr.

LEEDS.—At a recent meeting of the City Council, it was decided definitely to reject the Quarry Hill site for the proposed Smithfield Hall.

LOFTUS. The North Riding Education Committee are proposing to erect a new school here; but this scheme is being strongly opposed by the ratepayers of Liverton, who ask that the school at Liverton Mines shall be extended.

WATERFOOT.—An inspector of the L.G. Board has conducted an enquiry at the Municipal Offices, Rawtenstall, relative to an application by Rawtenstall Town Council for permission to borrow £1,500 for the purpose of re-constructing Waterfoot Market.

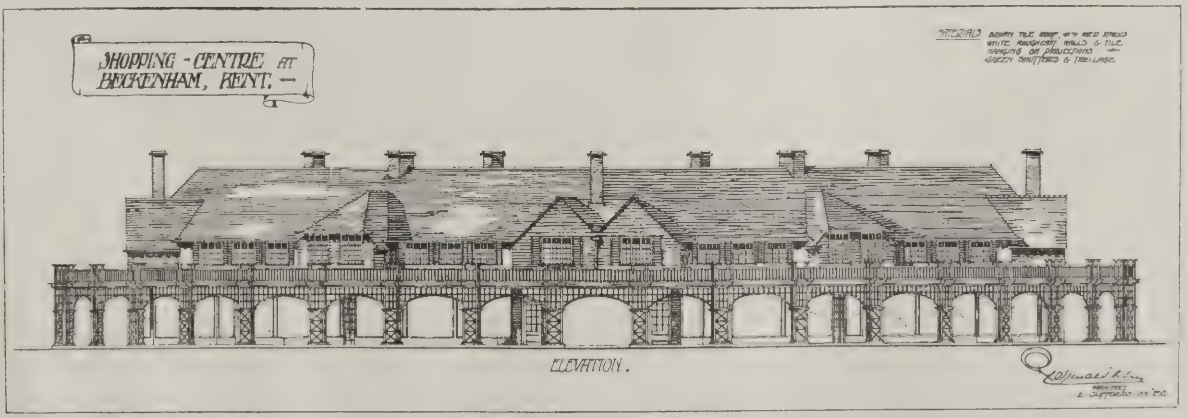
YORK.—A L.G. Board enquiry has been held into an application by the Corporation to borrow £25,250 for the purposes of a new street proposed to be made from Pavement to Piccadilly, and to include a steel girder bridge over the river Foss. The new street is designed to give better access to the city from the Hull Road and Fishergate districts, and to relieve the congestion in Fossgate and Walmgate. The scheme has already been authorised under a Provisional Order, and sanction obtained for the purchase of part of the property. The present application includes the estimated cost of the remainder of the property and of the bridge and street works.

Our Plate.

In our issue of October 27, we gave a short account and some illustrations showing the new garden suburb rapidly springing up near Beckenham, and known as "Parklangley," Kent. We now show its remarkable shopping centre and the general lay of the roads.

The plan clearly shows one-half of the circle of shops, while the other two quarter-segment give one-quarter of the first and second floors. It will be noticed that in shape it is a hollow circle surrounding a covered court yard. On the outer side, immediately within the piers, is the promenade, some 15ft. in width, covered in above, ample light being admitted through the lantern lights above. The shop fronts are ranged on the inner side of this walk, and so in the worst weather the shopping duties or pleasures would be possible in comfort. The circular courtyard is reached through four covered ways running out to the points of the compass. The centre of this courtyard will be occupied by a bandstand or fountain, while palms or ferns will be arranged around so as to give the appearance of a winter garden. Some of the shops will have their fronts facing this winter garden—photographs and pictures, sweets, fancy goods and tea shops. Probably tea would be served in this winter garden. A few of the trades, such as butcher, baker, motor and cycleman, fishmonger, oilman, ironmonger, would be ranged outside the shopping area, as some of them require workshops attendant upon them, while others carry on a class of trade which would not be suited to the shopping area.

The general lay-out of the estate has been governed by several things—first, by the magnificent avenue of trees which runs from east to west; secondly, a sewer put in some years ago by the Council; thirdly, the retaining of the old manor house, and fourthly by a road laid down some years back, taking an extraordinary line without apparent rhyme or reason. These were the difficulties which faced Messrs. H. and G. Taylors, the owners, and they called in Mr. Reginald C. Fry, who, after many attempts, drew up a plan with its basis that of Napoleon's grand conception of Paris, save that instead of making his axis a triumphal arch, he made his radiating roads and broad avenues converge on two centres for shopping. In a later plan one of these was given up, and revised more upon economic lines, and the southern shopping centre gave place to a church site.


SHOPPING-CENTRE AT BECKENHAM, KENT.—
MATERIALS BROWN TILE ROOF, WITH RED STACKS WHITE ROUGHCAST WALLS & TILE HANGING ON PROJECTIONS — GREEN SHUTTERS & TREILLAGE.
ELEVATION.

PARKLANGLEY GARDEN SUBURB: ALTERNATIVE ELEVATION FOR PROPOSED SHOPPING CENTRE, REGINALD C. FRY, ARCHITECT.

NOTES ON REINFORCED CONCRETE CONSTRUCTION.*

By Professor Stephen M. Dixon (University of Birmingham).

At no time in the history of architecture has the position of young architects been more interesting than at present. The possibilities of reinforced concrete are as yet realised only by a few. The adaptability of the material to various kinds of structures is most wonderful, and the architect has now an opportunity to show his appreciation of this combination of materials. For the last few years English architects and engineers with proverbial caution have been watching and criticising the work of others in reinforced concrete. *Festina lente* is doubtless a wise maxim to follow at certain times, but we must not be so cautious as to stand still; and just at present we find that we are left far behind by Continental and American architects in making use of reinforced concrete in all kinds of buildings. Many fine opportunities are waiting the enthusiastic architect who, with an accurate knowledge of the materials separately, and of their behaviour when combined together, has the courage to put his knowledge to the test and build in the new material.

I should have said neglected, instead of new material, for it is more than 50 years since reinforced concrete was first used in England. For many years iron embedded in concrete has been used in foundations, and it is a long time since the first concrete and iron roofs were erected; but till recently, except in foundations, the combination of the materials has been little used. To avoid being misunderstood, I should point out that though much excellent use has been made by several architects of reinforced concrete as a substitute for other materials, still, in general, its properties are not at all fully appreciated, and its use at present rarely modifies the form of a building.

If the architect is to use the material with most effect, he must make a particular study of its properties himself. Calling in the services of a "calculating man" to do the steel and reinforced concrete work may save a lot of trouble, but the ultimate effect is sure to be disappointing. The architect who has formerly learned to express his ideas in timber, stone, or brickwork, must now learn the possibilities of construction in reinforced concrete. Up to the present the material, where it has been used, has been merely substituted in the unseen and frequently neglected parts of a building, and in the majority of cases it would need a skiagraph taken by an X-ray apparatus to tell us that the buildings in question were just steel and concrete skeletons covered by stone masonry. I know that this is often defended in principle as following an example set by the older Italian architects, who covered many of their brick structures with marble; but a little reflection will soon show that the cases are not similar. If structures of timber present features characteristic of the material, which characteristics we should not imitate in masonry, so structures of reinforced concrete should be distinguished by their form from those of masonry.

It is generally easier for us to recognise the faults of previous generations; the magnificent timber arch by Wickeling at Bamberg was disfigured by timber facing representing arch quoins. In the same way, just at present owing to natural conservatism, or, rather, to the imitative instincts, which are unfortunately shared by architects and engineers, the great buildings in reinforced concrete in this country are covered by masonry. It seems as if the real characteristics of the material, strength and lightness, do not appeal to the designers of these structures, which in their exterior at least imitate masonry. For this reason pictures taken during the construction of the few great reinforced concrete structures in England are more interesting, at least to the engineer, than pictures of the finished work.

There is no doubt that this method of building proceeds along the line of least resistance, and the architect incidentally escapes a lot of lay criticism. For, in general, in this country we like those things to which we have grown accustomed, and heavy masonry gives an idea of solidity and durability which must be pleasing to many, if the hideous monstrosities to be seen in cemeteries mean anything.

On the other hand, there will always be found a few who, appreciating to the full the wonderful qualities of the material, are led into what the more sedate consider fantastic extremes. The structures erected by these enthusiasts will at least have the merit of demonstrating the possibilities of reinforced concrete work, and will doubtless point the way to what will ultimately become a characteristic style in buildings of this material.

Many causes have delayed progress in reinforced concrete construction, and foremost among them may be placed the building regulations of various municipalities. The regulations referring to reinforced concrete are frequently harmful if not merely inefficient. But, owing partly to a kind of reaction, partly to the enthusiasm of a few experts, and especially to the energy and business enterprise of various construction companies, we find just now numerous projects for reinforced concrete work.

If the architect requires a knowledge of the properties of the materials in order to adopt this method of construction, he also needs it if, with a view to saving himself trouble, he hands over the concrete work to a special firm of engineers or contractors. For, if he be satisfied to erect what seems to him an artistic shell concealing an ugly, though necessary skeleton of reinforced concrete work, how is he to choose his engineer and satisfy himself that of the innumerable so-called systems he is selecting one that is not only sound, but best suited in every way to the design in hand? Division of labour is all very well, but a truly artistic structure should show to those capable of criticising it that there is a perfect harmony between its various parts such as can rarely exist unless one mind has been responsible for the complete design. I know that objections are made to the use of the word artistic, but I must use it, and shall venture to apply it to some engineering structures and defend its use; for it is perhaps allowable to call that structure artistic which, in the opinion of those competent to judge, will satisfy Dürer's criterion quoted by Ruskin: "This for what it has to do, and the way it does it, cannot be excelled."

I have no doubt that one reason why even still so few large buildings have been erected in reinforced concrete in this country is that many of those who have already designed great works in stone and brick recognise that for the proper development of structures of the new material great changes in design will be required, and therefore they hesitate to undertake schemes which might lead them much further than they are prepared to go. Some are satisfied to leave reinforced concrete alone, saying, perhaps, that it is an untried material, and not at all suited to artistic requirements; while others may use a few steel joists in concrete in the foundations, so that, with the materials safely out of sight, they can claim to be thoroughly up to date, and yet, at the same time, proceed generally by old established methods in stone, brick, and timber.

But the younger architects must be prepared to adopt the new materials in no half-hearted way, or expect to be called to defend vigorously their neglect of them, and so a careful study of the properties of the combination is essential in either case.

It is frequently said that reinforced concrete is an impossible material from the artistic standpoint, and so must be used only in floors and foundations and other places out of sight. The strength of this combination of materials is severely criticised when some modern structure fails during erection. We are told that owing to its recent introduction we are utterly unable to say whether it is really durable, and that such great care is needed during its construction, and such strict supervision required that either the cost becomes excessive, or that dangerous flaws may be concealed. Again, many in a general way say that they dislike the idea of trying to combine two such different materials as steel and concrete, that much more experience is needed, and that further experiments should be made before this method of construction is adopted. Lastly, the more exact objectors ask definite questions: Is the steel embedded in the concrete subject to corrosion? Will this construction stand shock, vibration, and changes of temperature on a moderate scale, and in extreme cases resist the effects of fire and earthquake?

Taking these objections in the order given, we may first glance at the extremely interesting point as to whether the material is satisfactory from an artistic point of view. Let us for a moment contrast some typical works in masonry, or even steel, with similar structures in reinforced concrete, and I am afraid that in condemning the more recent structures we shall be inclined to blame the material. But is this fair? In the majority of cases all the possibilities of reinforced concrete have not been considered in reference to the problems to be solved, and so structures are presented which are merely copies of masonry or steel structures instead of being worked out on their own lines. To illustrate this point, pictures showing the Bridge of Sighs, Bridge of St. Angelo, and some heavy masonry arches on the Canadian Pacific Railway were put on the screen; and in the latter was noticed particularly the massiveness so characteristic of most stone structures. Again, the steel arches as shown in some further slides, would surely be judged artistic when tried by Dürer's criterion; and the suspension bridge as one of its best examples is generally pleasing. Such structures may be considered as types combining lightness and strength. Now, contrast with these a few unfortunate examples of reinforced concrete bridges, which examples are chosen from our own neighbourhood—the United States and Spain. In the first of these the designers seem to have had plate girders in their mind (I had almost said on the brain), and in the last a timber trestle bridge, but in no case is the result judged from any point artistic. But that good results may be obtained when a skilful designer is not afraid to use the materials to the best advantage, will be seen by looking at the magnificent Walnut Creek bridge at Philadelphia, where a fine span has been made possible by connecting two arch ribs by a reinforced concrete floor. Concrete is often condemned on account of surface appearances. This unsatisfactory condition is because too few architects and engineers in this country have yet paid attention to the finishing of the concrete surface. Engineers in England are generally satisfied with the surface just as the shuttering, very often roughly put together, leaves it, whereas few materials present such fine opportunities for effects, which may be obtained either by treatment of the surface finish or by colour.

About the strength of reinforced concrete work properly designed and executed with care, there can be no doubt. One of the most remarkable tests ever made on an engineering structure was carried out on an experimental arch built on the Monier system in 1890. In this system, practically the first adopted, the reinforcement consists of a wire mesh near the soffit of the arch, and this method might be more frequently used in the roofs of great buildings. The test arch was built with a span of 32.8ft., a rise of 3.28ft., and a width of 13ft. The depth at the crown was only 6ins. The reinforcement was a net of iron wire, .39in. and .28in. diam., placed about 3ins. centres and 2ins. from the soffit. The following tests were made: first a locomotive weighing 40 tons

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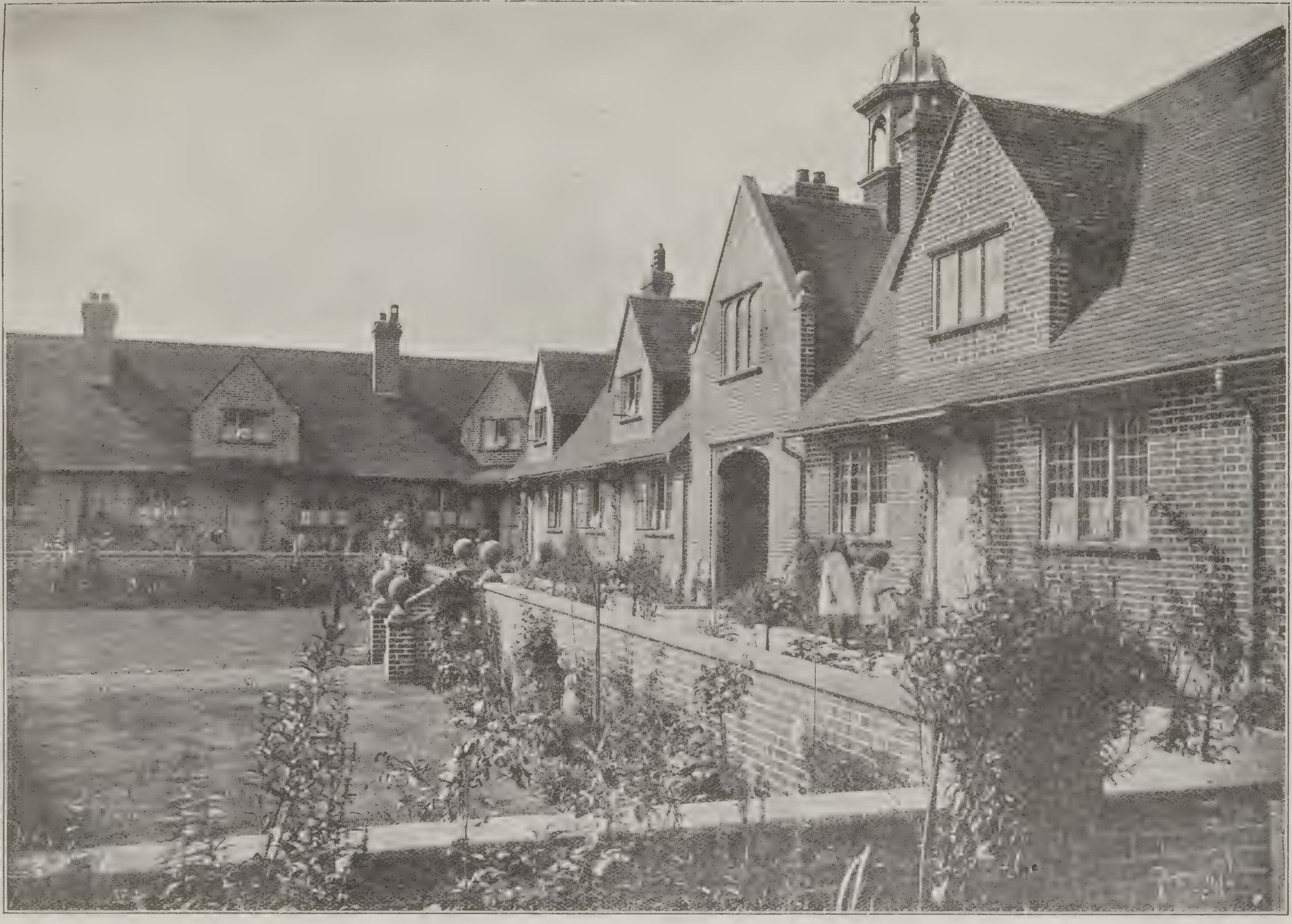
*Substance of paper read before the Birmingham Architectural Association.



THE CHURCHILL COTTAGE HOMES, CHEDDAR VALLEY, SOMERSET. SILCOCK AND REAY, F.R.I.B.A., ARCHITECTS.

These houses are arranged on three sides of a quadrangle about 120 feet square. The fourth or south side is enclosed by a low brick terrace wall. The buildings are of red brick with woodwork in oak, and tiled roofs.

was placed on the crown, then it was run off, and a 53-ton locomotive was run over half the arch. Having stood these tests successfully, a dead load of 110 tons was piled on the half span; this was about 1,000lbs. per square foot, and the deflection was only .12in. When the load on the half span was gradually increased to 2,000lbs. per square foot, the arch failed, the abutments giving away.

When the more conservative members of our professions speak of the material as not having yet stood the test of time, I think we may still have every confidence in its durability. For, though we cannot say that it, like masonry, is as old as the hills, still, it is not exactly a mushroom growth, for we find examples in Roman architecture of reinforced concrete, which date back to the year 212. It is true that the reinforcing rods in these cases are of copper, and so for a true comparison we must show that iron or steel rods embedded in concrete are as durable as those of copper. This question will be noted later, but it may be mentioned here that Mr. Edwin Thatcher quotes the case of a bar of iron which, embedded in concrete, had remained 400 years under water, and was then found free from rust. But reinforced concrete as we understand it has been many years in use. The first patent recorded is that of W. B. Wilkinson in 1854, for hoop iron in concrete floors, the hoop iron being placed in the lower side, while in 1855, at the International Exhibition in Paris, L. J. Lambert exhibited a boat built of concrete and iron. In 1851 Coignet published a pamphlet in which he suggested using a metal reinforcement in concrete, while in 1866 Monier took out his patent; and his method has been used for the last 17 years for bridges in Switzerland, Austria, and Hungary. In North America Ransome first suggested reinforcing beams in 1882, and took out his first patent in 1884, and in 25 years the development has been so phenomenal that it is certainly unnecessary in the United States to speak of the advantages of this method. In fact, when we find buildings 16 and 17 storeys high quite common, and that frequently the materials used are only indifferently good, it is probable that words of caution rather than of encouragement are needed.

No one can deny that great care and supervision should be exercised in the construction of reinforced concrete buildings; but all structures which have been designed with due regard to economy of materials require to be erected with care, and the designer relies on good materials and good workmanship. Plain concrete and masonry also require supervision during construction; and we should remember that by introducing reinforcement we greatly reduce the amount of concrete needed, and so reduce the time of laying the concrete, and consequently the time of supervision. But in any case, the architect who builds in reinforced concrete acts as his own manufacturer, and having tested the raw materials, as it were, cement, sand, gravel, and steel, he proceeds to manufacture the concrete and place it in position round the steel by ordinary labour, and, of course, this labour must be superintended.

The general objections are often urged by those who have not given much thought to the subject. In a well-designed reinforced concrete beam, to take a typical example of the work, we are not trying to mix together two unlike substances, but we are making use of the special properties of two materials, concrete and steel, in the most advantageous way. And, moreover, the construction possesses the enormous advantage that when we enclose the steel in concrete we cover it with a perfect preservative. As is well known, the weak point in trying to preserve steel or iron from corrosion, by covering it with a mixture of oil and some pigment, is the necessity of having the surface clean and absolutely free from rust before applying the paint. When, on the other hand, we embed steel in cement mortar, it is found that the best results may be obtained even with rusted metal. In fact, many architects and engineers prefer to use rusted steel in their reinforced concrete work, since they claim that the iron oxide is readily converted into ferrite of calcium. Whatever may be the chemical action, the result is that if rusted steel or iron, having been embedded in concrete for some time, is then cut out, it will be found clean and bright.

If we look at the record of work successfully executed in Europe and America, it will be apparent to everyone that already a great deal of experience has been gained under most varied conditions. In fact, owing to the enthusiastic way reinforced concrete has been taken up in the United States, English architects start with the results of experiments made on a very large scale. In the way of experimental research, of course, much remains to be done; and co-operation between various architectural associations, engineering societies, and the universities is needed, so that the laboratory work may be carried out along the most useful lines. For, though an immense amount of this work has already been done at several of the large engineering schools in the United States, there is still much to be learned.

Now, for the definite questions we have definite and, I think, very satisfactory answers.

Steel thoroughly embedded in concrete is not subject to corrosion. Your attention has been called already to the fact that as a preservative for iron, concrete acts in such an excellent manner that many authorities believe there is actually a chemical reaction between the cement and the metal. But we have more direct evidence. Some reinforced concrete piles were driven in Southampton Water, and the tops having been cut off were thrown on the foreshore, where they were continually washed by the tides. After lying there for nine years, the concrete was broken open, and the embedded steel showed no signs of corrosion, though the protruding ends had rusted away. Mr. de Vesian mentions the case of some iron embedded in the concrete of a Paris sewer, which after 40 years was in a state of perfect preservation. That with care concrete can be made watertight, is now admitted, and many watertanks have now been built of reinforced concrete. At Frankley the service reservoir of our water supply is constructed with expanded metal and concrete, and in France the Coignet Company have built wine vats of concrete and steel. I think we may admit that this is a good test.

The steel, therefore, embedded in the concrete, not being subject to corrosion, if we can show the combination is not liable to deterioration owing to shock or vibration, we have a most durable material of construction. But there is much so-called reinforced concrete work which can have no such claim. Many builders, even when convinced that a new material should give satisfactory results, are content to use it merely as a substitute, instead of seeing that the designs are so modified as to get the best results from the material. For example, it frequently happens, in current practice, that reinforced slabs are substituted for flooring, and are supported on steel joists, while the ceiling hangs from the lower flanges of these joists in a similar way to lath and plaster work. This construction, though utilising the great strength of reinforced concrete, does not bring out all the good points, for by this arrangement the joists, clips, and fastenings are all subject to decay.

That reinforced concrete will stand shock and vibration to a wonderful degree, is shown in the successful driving of piles of this material, and also in the satisfactory state of the few railway bridges already built in concrete and steel.

Its resistance to stresses due to small changes of temperature is also remarkable. We know that the coefficients of expansion for temperature of cement and steel are very nearly the same, and experiment shows that very long walls of reinforced concrete can be built without expansion joints and without any visible cracking. The stadium at Harvard University has an outside wall 1,390 feet long, built in reinforced concrete, and notwithstanding the several changes of temperature to which it is subject, there are no apparent cracks. This is really an obscure question, and further experiment is needed, for while Considère holds that reinforced concrete can expand about 10 times as much as plain concrete without cracking, Turneaure and others state that such is not the case. It seems likely that the action of the reinforcement is to substitute for a large expansion crack an infinite number of microscopic cracks which, however, if they exist, have been shown to have no ill effects on the durability of the steel inside.

Under the more severe tests of fire and earthquake, the behaviour of reinforced concrete is quite exceptional. Concrete has long been used for fireproofing, and the only thing necessary is to give the concrete sufficient thickness to make it really protective. But always great care in the selection of materials and strict supervision is needed. In the report of the National Fire Protection Association, Chicago, May, 1906, we find: "We should like to emphasise the fact that a concrete building, even if designed along the most approved lines of present-day engineering, may be very good or very poor as to fire resistance, according as the selection of materials and execution of the entire work is intelligently and honestly carried out, or otherwise."

With regard to the resistance of structures of reinforced concrete to earthquake shock, the great earthquake of San Francisco gave conclusive evidence as to their satisfactory behaviour. A number of slides were shown, on which may be seen the damage done by the earthquake to the building of Stanford University. The shock at the University was much more severe than in the city, and the effects were not complicated by a subsequent fire. It could be seen that in every case the reinforced work stood well, while brick, stone, and plain concrete buildings collapsed.

To show the amount of hard treatment the material will stand, I might call your attention to a warehouse recently built in Tunis. When the building was completed, the foundations on one side gave way, and the whole block tilted over till it was inclined to the vertical at 25 degs. By excavating under the other side and loading it, the building was levelled, though, of course, now it stands several feet lower than originally designed.

I have tried to show that in reinforced concrete we have a material strong and durable, and therefore suitable for many architectural purposes, but I have said nothing of the many so-called systems of reinforced concrete work. Too much time has been already spent in developing these various systems, differing in many cases only in the minutest details from one another. What is needed is that architects and engineers having studied the principles of construction in it, both in theory and by experiment, should set to work to design structures in such a way that the special properties of the material may be used to the best advantage. We may note the advances made in the designs of retaining walls by comparing the designs of a typical gravity wall and of a reinforced concrete wall.

Up to the present too much copy work has been done. We have become so familiar with the advantages of steel and iron that much reinforced concrete is designed, as it were, to be erected in metal alone. Girders in this material have been developed to a very large extent, but in architecture I feel sure that the great success will lie in its use for arches and vaulting, while in many cases the cantilevers supporting galleries will be superseded by ribbed floors. [Slides showed some beautiful ribbed roofs erected by M. de Bandot in France; the arched roof and main girders and cantilevers of the New Theatre in Copenhagen, by Mr. Suenson; and the galleries of the Sidwell Street Church at Exeter, by Mr. Coles.] Through the kindness of the architects, I have been enabled to show these interesting structures.

We are at present in a transition period. Many of the new designs must be merely tentative, but to use architectural effect only to conceal the main structure, must be wrong. There are but two straightforward courses, either to ignore a durable, easily worked, and cheap material, a line of action which will seriously impede progress; or, accepting the material, to study its properties, so that in our designs we may use it to the best advantage.

Societies' Reports.

nburgh Architectural Association.

To the members of Edinburgh Architectural Association Mr. F. Morley Fletcher, director of the Edinburgh College of Arts, delivered a lecture in the Association's Rooms, George Street, Edinburgh, on "Materials and Treatment in Wall Decoration." Mr. Morley Fletcher inquired into the reasons of the lack of any great modern school of wall decoration that would bear comparison with those of the great masters of the past, and suggested that the conditions of our climate and national life called for a different character of decoration, or that the reason might be simply that a proper technical method had not yet been found that would satisfy the conditions imposed by our humid climate and the impure atmosphere of our cities. He stated certain established principles, and emphasised the principle that however elaborate the enrichment of a design might be the sense of illusion should never be given to an extent that would appear to destroy the flat surface of the wall. He described and compared the methods of modern decoration as shown in the decoration of the Pantheon in Paris, the Boston Library, the lunettes by Lord Leighton at South Kensington, and the decorations carried out in Edinburgh by Mrs. Traquair. Some examples of the modern revival of fresco painting were shown and criticised by the lecturer, who said their element of failure was their inability to resist the dangers of our climate by reason of their exposed surface, and their liability to decomposition owing to the acidity of a city atmosphere. He stated that Professor Church, in examining the exterior limestone of St. Paul's Cathedral, found the limestone to be changed to sulphate of lime to a depth of three-quarters of an inch by the action of sulphurous acid in air and rain. In recommending, as an experimental method, an impervious ground of zinc white, and the complete protection of the painted surface by means of varnish and a renewable coating of wax, as more suitable than fresco to our climate and conditions, Mr. Fletcher emphasised the necessity for retaining and using the luminous power of the wall and for avoiding loaded lights. Examples of classic work were shown and compared with modern work of various types, by means of lantern slides and other reproductions of wall decoration.

Leeds and Yorkshire Architectural Society.

At a meeting of the Leeds and Yorkshire Architectural Society, a paper on the "Life and Work of Cuthbert Brodrick" was read by Mr. Butler Wilson, and in the course of his paper Mr. Butler Wilson expressed the opinion that Leeds Town Hall was perhaps his greatest work, although he was the author of the designs for several other fine buildings, including the Wells House, at Ilkley, the Leeds Corn Exchange, the Hull Town Hall, and the Leeds Institute. He submitted his designs for the Leeds Town Hall in the competition which had been inaugurated by the Leeds Corporation in 1852, and he was then only twenty-nine years of age. The estimated cost of the execution of his plans was £41,835, but the actual building, when completed with the clock tower, cost some £122,000. In later years Brodrick was one of the architects commissioned by the national authority to submit designs for a National Gallery in Trafalgar Square, London. Mr. Butler Wilson dealt with his subject in a most interesting manner, and with great wealth of detail. It seemed strange, he said, that no one had ever thought it worth while to write Brodrick's biography. One rumour that he would especially like to contradict was that which had been circulated to the effect that Brodrick was a waster and that he died in poverty. This was entirely untrue. Brodrick was always in comfortable circumstances, and at his death left a respectable fortune. A number of lantern slides illustrative of Mr. Butler Wilson's paper and a collection of original drawings by Brodrick were shown.

Before the members of the Leeds and Yorkshire Architectural Society, at the society's rooms in Park Street, Leeds, a lecture on "An Unknown Italian City" was given by Mr. Martin Shaw Briggs (London and Otley). Mr. Briggs was recently appointed an Oxford Extension lecturer, Oxford University. The lecturer said his subject—Lecce—was the capital of the province forming the heel of Italy. This district was entirely neglected by tourists, and it was only by chance that he was enabled to visit it in the spring of 1907. On that occasion he was accompanied by Mr. Ralph W. Thorp (assistant hon. secretary to the society), whose excellent drawings had subsequently appeared in the "Architectural Review." He (the lecturer) found valuable material at Lecce, historical as well as architectural, and decided to write an illustrated monograph of the district under the title of "In the Heel of Italy." It was from the chapter of this work dealing specially with architecture that he drew the substance of his lecture. Mr. Briggs pointed out the influences at work in Italy, and especially in the southern portion of the country, which contributed to produce a remarkable architectural period in this remote city. Referring to the suitability of the term "baroque" as applied to the architecture of this period, he compared its characteristics in Lecce with those in better-known cities, and urged the rare charm of a complete "baroque" city. Examples of the middle of the sixteenth century architecture in Lecce varied from a comparatively pedantic type to an extravagance of grotesqueness far from pleasing, but in a later period a more settled style became noticeable, and it was to this epoch that the city owed the majority of its buildings. The lecture was illustrated by about thirty lantern slides, mostly of architectural interest, the majority of which had been prepared from the lecturer's own pen and ink drawings. Many of them illustrated beautiful palaces and street views characteristic of the city.

Glasgow Institute of Architects.

At a meeting of the Glasgow Institute of Architects (Associate Section) held in the Rooms, 39, Elmbank Crescent, Mr. William Sinclair delivered a lecture on "Ruskin on Architecture." Mr. Sinclair briefly sketched the rise of architecture, and defined its claim to be considered as one of the fine arts, also dealing with its influence on individual and national character. Thereafter, a detailed account was given of Ruskin's plea for a better understanding of Gothic architecture, and in particular its more common use in our domestic and our public buildings. Several passages were referred to in Ruskin's "Stones of Venice" and "Seven Lamps of Architecture" in support of the lecturer's contention that as a city Glasgow had not yet attained a very high ideal in domestic architecture, especially in the homes of the workers. At the close of his lecture Mr. Sinclair made reference to Ruskin's severe criticism of the restoration of historic buildings.

Northern Architectural Association.

At the second ordinary meeting of the session, held on December 8th, Mr. John W. Simpson read a paper entitled, "With Share and Mattock." In his introductory remarks Mr. Simpson said that words of Tennyson's "Northern Farmer." "I 'a' stubb'd Thurnaby waästes," suggested so well the quiet, dull task which architects have to accomplish that he commended to those present the merits of the ploughshare and the hoe. "There has been and still remains," continued Mr. Simpson, "much waste land to 'stub,' ungenerous ground rendering slow return to the courageous labour which is ever breaking it to husbandry and keeping down the growth of evil weeds." Then, likening the every-day business of the profession to "Thurnaby waäste" and the task of the Royal Institute and allied societies to its "stubbing," Mr. Simpson dealt with some of the multifarious duties with which the Institute is charged on behalf of the profession, and reminded his hearers that much of the work of the committees and of the Council is necessarily done in private, and because of its quiet success is no more heard of. In his concluding remarks Mr. Simpson said, The Royal Institute is not a trades union; it is not a weapon to use against our clients, but rather an instrument to encourage and confirm the confidence in us their advisers. The true question, then, for its members to ask, and indeed for all architects desiring more than their own selfish ends, is not, "What has the Institute done for me?" but, "What have I done for the Institute?"

The Junior Institution of Engineers.

With the permission of Mr. Maurice Fitzmaurice, C.M.G., Chief Engineer to the London County Council, a large party of members of this institution recently paid a visit of inspection, under the guidance of the resident engineer, Mr. E. H. Tabor, M.Inst.C.E., to the Embankment Wall Works for the New County Hall, Belvedere Road. The Hall is to be erected on land reclaimed from the River Thames. This area of about two acres will be enclosed by an embankment wall nearly 600ft. long, which is now being constructed. The new wall, which will be very similar to the Victoria Embankment on the opposite side of the river, is built of concrete, with a granite facing down to low-water level, and with a granite parapet. It is being constructed inside a cofferdam, consisting of a single row of 14-in. Oregon pine piles, which have been driven into the London clay, upon which stratum the wall itself will be founded. Behind the wall is a continuous concrete raft 5ft. thick, on which foundation the main building will be erected. A width of about 40ft. next to the Embankment wall will be vaulted, the top of the vaults being paved and forming a terrace. Special precautions have been taken at the end of the work next to Westminster Bridge in order to avoid disturbing the bridge foundations. With this object a caisson, 35ft. by 20ft., has been sunk by the compressed air process close to the abutment of the bridge, and this part of the wall founded upon it. At the conclusion of the visit, Mr. Percy Young (member of the Council) expressed the acknowledgements of the members for all the facilities which had been extended in connection with the occasion.

The Carpenters' Company.

The Worshipful Company of Carpenters announces another course of lectures, to be given during the early months of next year at the Carpenters' Hall, London Wall, E.C., on Wednesdays, at 7.30 p.m. The following is a list of the dates, lecturers, and subjects:—January 12th, Professor Beresford Pite, F.R.I.B.A., "What is Artistic Craftsmanship?"; January 19th, M. H. Baillie Scot, Esq., "The Art of Building, with special reference to the use and abuse of materials"; January 26th, Banister F. Fletcher, Esq., F.R.I.B.A., "The Carpenter's Craft"; February 2nd, Sir Brumwell Thomas, F.R.I.B.A., "The Joiner's Craft"; February 9th, Arthur Stratton, Esq., A.R.I.B.A., "Native Craftsmanship in Timber, Brick, and Stone before the 18th Century"; February 16th, Lawrence Weaver, Esq., F.S.A., "The Art of the Lead Worker"; February 23rd, George P. Bankart, Esq., "The Art of the Plasterer"; March 2nd, C. F. A. Voysey, Esq., "Castles in the Air"; March 9th, Halsey Ricardo, Esq., F.R.I.B.A., "The Use of Coloured Materials in Building"; March 16th, Professor G. E. Moira, "Mural Painting"; March 23rd, R. Anning Bell, Esq., R.W.S., "Coloured Reliefs and Mosaic"; March 30th, F. W. Pomeroy, Esq., A.R.A., "Sculpture as applied to buildings"; April 6th, Thackeray Turner, Esq., F.S.A., F.R.I.B.A., "The Craft of repairing buildings." Tickets of admission to the lectures can be obtained free, from Mr. J. H. Freeman, the Clerk, Carpenters' Hall, London Wall, E.C.

These lectures will, as before, in the first place, be for all craftsmen and those engaged in actual trades in connection with the constructive arts, but all of either sex and of any trade or profession are invited to attend. Admission will be free by ticket. The lectures will last about three-quarters of an hour, and at the close, questions on them may be asked. At the end of the course prizes will be offered as mentioned later, under the following conditions:—

(1) Only craftsmen or those engaged in the actual work of carpentry, joinery, or the other arts connected with building can compete. The successful competitors, if called upon so to do, must satisfy the judges in this respect, and should any dispute occur, the judges' decision will be final.

(2) All competitors must have attended at least eight lectures of this series.

(3) No competitor can take more than one prize. The judges are empowered to withhold any, or all, prizes at their discretion. Good design will receive more consideration than skill in draughtsmanship, i.e., design thoroughly appropriate for the material dealt with. Drawings may be either in pencil or in ink, and may be coloured. Preference will be given to good working drawings. No design to be framed or mounted. The greatest care will be taken of drawings, but the company will not hold themselves responsible for them.

(4) No names must appear on the drawings, but a distinguishing motto or number must be put on each single drawing of each set. The name and address of the competitor to be enclosed in a sealed envelope, bearing on the outside the motto or number which is used on the drawing or essay.

(5) All drawings for the above competitions to be delivered, carriage paid, at Carpenters' Hall, London Wall, London, E.C., before 12 noon, on May 14th, 1910.

SUBJECTS OF COMPETITION.

1. Design for a small detached cottage to cost about £150 or £200. Plans, section two elevations, scale ⅛in. to a foot. The objects to be aimed at are simplicity and straightforward use of materials without decorative features. First prize, £5 5s.; second prize, £2 2s.; third prize, £1 1s.

2. (1) Design for a simple cottage table, (2) design for a simple arm-chair, (3) design for any decorative work, such as frieze for a room, colour scheme, or any other mode of ornament. (Only two of this section to be attempted.) First prize, £3 3s.; second prize, £2 2s.

3. Design for interior of a living room. Plan and elevations of two or more sides, showing fireplace and window. Any scale. First prize, £4 4s.; second prize, £2 2s.

4. Design for a piece of work which must be in the material of the competitor's trade. First prize, £3 3s.; second prize, £2 2s.

Mr. W. Noble Twelvetrees, M.I.Mech.E., A.M.I.E.E., M.R.San.I., has removed to 193, Bedford Hill, S.W. The telephone number, 1221 Battersea, remains unaltered.

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At the meeting of the R.I.B.A., on Monday, 13th inst., the decease of the following gentlemen was announced:—Henry Bayly Garling, Associate, 1843, Fellow 1857; Thomas W. Cutter, Associate, 1873, Fellow, 1879; George Campbell Sherrin, Associate 1882, Fellow 1898.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Dec. 31.	SOUTHEND-ON-SEA. NEW COUNCIL SCHOOL. Limited to Architects practising in the Borough. Conditions of competition and plan of site on application to J. W. Barrow, Clerk to the Education Committee, Education Offices, Municipal Buildings, Southend-on-Sea.
1910. Jan 1.	LARNE. TECHNICAL SCHOOL IN VICTORIA STREET. For the Larne Technical Instruction Committee. Total cost, including fixtures and enclosing of ground, not to exceed £3 600. Premium, £21, merged. Successful competitor will receive commission of 5 per cent. for supervision, including plans, specifications, estimates, and *Bills of Quantities*. Particulars of Thomas Clearkkin, Secretary, Technical Instruction Committee, Larne.
Jan. 1— Mar. 1.	NEW BUSINESS PREMISES, LEEDS.—The Directors of the Leeds Industrial Co-operative Society (Ltd.) invite competitive drawings and estimates for new Business Premises and Offices, to be erected on the site of the old "Mercury" Office, Albion Street, Leeds. Premiums of £100, £50, and £25, respectively are offered, and will be awarded to the authors of the designs and plans placed first, second, and third by the Assessor. Conditions of competition, and lithographed plans and other particulars, will be forwarded on application to the Secretary, on or before Jan. 1, 1910, on receipt of stamped addressed foolscap envelope, accompanied with a deposit of £2 2s. Competitive designs and plans to be sent in to the Secretary, John W. Fawcett, Leeds Industrial Co-operative Society (Ltd.), 10, Albion Street, Leeds; not later than March 1, 1910. To the architect deciding not to compete, and returning all documents within seven days, the deposit will be returned.
Jan. 15.	ELEMENTARY SCHOOL, KEIGHLEY.—The Education Committee invite competitive designs and estimates for a new Public Elementary School for older children to be erected at Highfield, Keighley. Printed instructions and conditions, with a lithographed plan of the site, may be obtained on application at the Education Offices. Designs and estimates to be sent by Jan. 15 to H. Midgley, Secretary, Education Offices, Keighley. Only architects residing or carrying on business within the Borough are invited to compete.
Jan. 31.	NATIONAL MUSEUM OF WALES. The Council desires to receive competitive designs for the erection of a new National Museum at Cardiff, Three premiums are offered of £200, £150, and £100, for second, third, and fourth. The Council have appointed Sir Aston Webb, R.A., Mr. John J. Burnet A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A., as Assessors. Particulars and plans of the site will be supplied to competitors on payment of a fee of £2 2s., returnable if all papers are returned within 14 days. Inquiries to be addressed to Dr. Wm. Evans, Hoyle, Director of the Museums, City Hall, Cardiff.
Feb. 1.	OLDHAM, EXTENSION OF THE TOWN HALL. Restricted to Architects practising or residing in the Borough. Premiums of £50, £30 and £20, for the three designs placed 1st, 2nd and 3rd, and a sum of £5 will be paid to all unsuccessful competitors who send in a complete set of plans in accordance with the instructions. Plan of site, with instructions and suggestions for architects obtainable from E. C. Foote, Borough Surveyor, Town Hall, Oldham. Deposit: 21s.
Mar. 1.	GLAZED BRICKWORK DESIGNS AND ESSAYS. A committee of glazed brick manufacturers invite designs for works to be executed in glazed brickwork, also essays as to the advantages to be derived from the use of this material in accordance with conditions to be obtained from J. Johnston Green, 142, Liverpool Road South, Southport. Premiums of 100 guineas, 50 guineas and 25 guineas awarded to designs and essays jointly. Assessor Mr. Max Clarke, F.R.I.B.A., appointed by the President, R.I.B.A.
May 31.	MUNICIPAL OFFICES, KARACHI. The Municipality offer a premium of 7,500 rupees (£500) for the best design, detailed plans and estimates for new Municipal Offices. Cost not to exceed 500,000 rupees, and the style of architecture is left open to the designers. Ferrotype plans of the site and a general arrangement of the floors of the building showing the accommodation to be provided together with a copy of instructions to architects, will be supplied to intending competitors on application to the Chief Officer and Chief Engineer, Karachi Municipality. A charge of Rs. 5 will be made therefor, which will not be refunded. Each set of drawings must be sent in anonymously, but accompanied by a sealed envelope containing the author's name and address. Each set of drawings and all the documents required, including the sealed envelope, must be securely packed in a wooden box addressed as follows:—The Chief Officer and Chief Engineer, Karachi Municipality, Karachi, India, and forwarded, at the competitor's own risk and charges, in time to reach the Chief Officer on or before the 31st day of May, 1910. It is proposed to apply to Government for permission for one of the chief architects to act as assessor to decide on the design to which the prize shall be awarded. The decision of the assessor will be final and not be open to dispute. The decision of the Municipality will be made within three months of the latest date for submission of designs, and payment of one-half of the premium will be made thereafter to the author of the selected design, the balance to be paid when the further details specified in the instructions to architects have been supplied. On payment of the premium the Municipality will have all rights in the design, with power to erect the building under its own agency, either according to the design selected or with such additions or alterations as it may deem necessary.

Works in Progress and Completed.

ACTON.—The Acton Wells new schools, which have been built off the Victoria Road, North Acton, at a cost of £17,345, were recently opened. The schools comprise three departments on three floors, and give accommodation for 1,124, while the area of the site covered by the school and playgrounds is just over four and a half acres. The architects were Messrs. E. C. P. and H. Monson, of Acton.

BIRTLEY.—The new aisle and organ chamber which have just been added to the Roman Catholic Church of St. Joseph were recently opened. The contractors for the extensions were Messrs. Burnett and Sons, Birtley, and the architects, Messrs. Boyd and Groves, Newcastle.

GLASGOW.—The new buildings erected in connection with St. Andrew's Episcopal Church in Low Green Street are now approaching completion. The architect is Mr. H. D. Walton, and the contractors for the new work are:—Mason work, Messrs. M'Leod and Campbell; wright work, James Wilson; slater work, M. Bertram; plumber work, Hugh Twaddle and Sons; plaster work, Arch. M'Kellar; measurer, Mr. A. B. Watson.

JESMOND.—The foundation-stone of a new parish hall for St. Barnabas' Church, Jesmond, has just been laid. The buildings, which are planned so as to leave enough ground for an official vicarage adjoining, are estimated to cost £1,950. Mr. A. B. Plummer is the architect.

LEEDS.—The foundation-stone of the St. Chad's Church extension at Far Headingley, Leeds, has just been laid. For the purposes of the extension the present chancel and apse have been taken down, and a new and larger chancel, 40ft. long by 24ft. wide, has been erected. A new choir and new clergy vestries are also comprised in the scheme, and it is proposed to erect a new side chapel, measuring 50ft. by 18ft. A new organ chamber is to be built, and an organ has already been promised. It is estimated that the cost of the extension will amount to about £4,800. Another £1,000, it is estimated, will be required for the proposed additional side chapel. Messrs. Wilson and Son, Headingley, are the contractors for the extension work, and Messrs. J. Gibbons and Son are the architects.

LONDON.—The new premises of St. Patrick's Benevolent Society, in Stamford Street, have just been opened. Three years ago the London County Council compelled the Society to rebuild and modernise its premises, and this work has just been completed at a cost of £10,000. The front part of the old building still stands, but is devoted entirely to administrative purposes; the old class-rooms at the back have been pulled down and rebuilt, and the playground space between the two wings is now occupied by a large assembly hall for the boys and girls.

Messrs. E. A. Roome and Co., builders, of 36, Basinghall Street, E.C., and Urswick Road, Homerton, N.E., have secured the contract for the completion of St. John the Baptist Church, Holland Road, Kensington, under the supervision of Messrs. James Brooks, Son and Adkins.

NEWCASTLE.—The new technical wing, which forms an extension to Rutherford College, Newcastle, is now being erected. The materials employed are red brick, with diaper of darker coloured bricks, and terra-cotta dressings. The roof is a concrete flat, covered with asphalte. Messrs. Middlemass Bros. are the contractors, and Messrs. Oliver, Leeson, and Wood, the architects, of Newcastle.

RADLEY.—The Council of Radley College have decided to proceed with the design for a new hall, prepared by Mr. T. G. Jackson, R.A., to correspond with the chapel built by him fifteen years ago. The new hall is estimated to cost £8,000. Messrs. Parnell, of Rugby, are the contractors.

SOUTHEND.—The new Hippodrome, which has been erected from the designs of Mr. Bertie Crewe, is English Renaissance in style, and is constructed in buff terra-cotta with dark red bricks and glazed brick dressings.

WALSALL.—The new drill hall, which it is proposed shortly to erect at a cost of £3,000, including the necessary fittings, will comprise a drill shed 100ft. long by 50ft. wide, quarter-master's store, office, armoury, etc. The architects are Messrs. Hickman and Farmer, Fellows of the R.I.B.A., and Mr. W. Wistance is the builder.

WAVERTREE, LIVERPOOL.—The new church of St. Thomas, which has just been consecrated, has been completed in every detail at a total cost of £6,845 10s. The exterior of the building is of brick, while the nave columns, the pulpit, and all the internal stone dressings are of white Bath stone. Seating accommodation for 703 persons is provided. The building contractors for the work are Messrs. Morrison and Sons, of Wavertree, Mr. R. Wynn Owen, A.R.I.B.A., of 60, Castle Street, Liverpool, being the architect.

WESTMINSTER.—The new Government office, which is to be erected in George Street, Delahay Street, and part of Charles Street, Westminster, will cost £1,000,000. The late Mr. J. M. Brydon was the architect.

The City of Paris has just been asked for a concession for a system of underground electric railways to unite the different stations of the Ouest-Etat, Nord, Est, Bastille, Paris-Lyons-Mediterranean, Orleans, with one another, and also with a station which is to be constructed near the Halles Centrales. The system, which is entirely independent of the existing Metropolitain, is intended for the rapid transport of merchandise. Its object is to relieve the congestion in the centre of Paris, which is encumbered all day by waggons of every kind. The plans contemplate a construction similar to that adopted for the system of 70km., which is to be established in Vienna for the carriage of mails, parcels, etc.

EFFECTS OF FIRE ON FIRE-RESISTING CONSTRUCTION.[*]

By A. Pordage. Firemaster of Edinburgh.

My experience has led me to the conclusion that it is not so much the matter of material as of internal arrangement of areas, floor spaces, partitions, and divisions, that is all-important in determining how far a building with its contents will resist effects of fire within its walls. The non-inflammability or otherwise of constructive material can have no retarding effect, for instance, in a light goods warehouse, where the floors are arranged in a series of galleries round a well through the centre of the building. And yet the materials in such buildings are carefully selected on the most scientific principles.

The disposition of spaces and partitions, and above all the particular uses to which the building is intended to be applied, are the governing factors in fire-resisting construction. It is erroneous to apply the term to the structure alone.

I am inclined to the belief that no building of whatever nature, stocked with highly inflammable goods, when once the stock has got well alight, will withstand the effects of the fire without sustaining serious damage to its stability.

I propose to show you the effects of fire on various building materials, by which you will see that, whilst under certain inexplicable conditions, a particular stone or manufactured material will come well out of the ordeal in one instance, it disastrously fails in another.

A most essential and deciding factor in a building during a fire, and one that has an important bearing upon the stability of stone and other material, is that of the air currents. Most materials, subjected to excessive heat in a still atmosphere, with a gradual rise and fall of temperature, will not be seriously affected; but if the same materials are subjected to sudden alternating currents of hot and cold air, the effects of expansion and contraction play havoc with walls and supports.

I will first take as an illustration the effect of fire upon what is commonly supposed to be an exceedingly reliable and "fireproof" requisite to most buildings, especially in Scotland, viz., a stone stair. As a stone stair has its slabs embedded in the wall, the effects of a sudden application of heat to the projecting portion of the slab causes it to expand. That portion of the slab which is embedded in the wall is not so suddenly affected, and if it were, it could not expand in the same ratio as the projecting portion. As a consequence, the expansion causes a fracture at the edge of the wall, and the projecting portion falls to the ground.

What makes the stone stair unreliable under these conditions is that it is not essential that the stone should come into actual contact with flame; the heat set up by fire in another portion of the building is sufficient to cause the stonework to collapse.

I have repeatedly seen, at fires in large houses where the stone stair has been taken up to the second or third floor and continued thence to the top floor by a light wooden stair, that the stonework has collapsed into fragments, and the wood stair at the top, where the greatest heat has been generated, has been almost wholly unaffected.

On the other hand, a common white wood stair often remains in position, and what is left of the unconsumed timber is sufficient to admit of firemen passing over it with safety.

A hard-wood stair, say, of 1in. treads, filled in with pugging or deafening, and a soffit of good plaster on the underside, will withstand the effects of actual contact with flame for the whole period of a fire; and, unlike stone, it is not affected by cold air or water. It is the sudden alternation of heat and cold which causes stone to collapse.

Of all material used in building construction, and particularly for stairs and unprotected landings, stone is the most dangerous when subjected to the effects of fire.

The position as well as the composition of stairs is an important matter to consider in designing buildings, particularly those of a public character, where large numbers of the public are to assemble. The stair well should not be within the main building, but should be attached. It is also a mistake to enclose these stair wells within four walls. The top outer half of each landing should be open to let off smoke or vitiated air. The size and number of stair wells should be determined by the number of people likely to require to use them.

The common stair in an ordinary tenement in Scotland does not add to the comfort or safety of the residents; a fire occurring on the lower floors causes the upper floors to be filled with smoke. Most common stairs are not ventilated at the top; consequently all the smoke escaping into the stairs from the house in which the fire has occurred has to be cleared off through the houses on the top floors.

It has often occurred to me that, instead of running the front wall of tenements up to the top in an unbroken line, balconies should be formed on each landing, the top half of which would be open to the air. The stairs would always be ventilated, no draughts flowing up under the doors, and no accummulation of vitiated air on the top floors. Such an arrangement would be an immense advantage in case of fire, because only the particular house on fire would be affected by the smoke, whereas with an enclosed stair as at present existing, a fire on the lower flats means that the whole of the residents above have to turn out, with the probable necessity of rescue from suffocation from the windows. I might also suggest that ornamental balconies would be a break in the monotony of our long rows of flat-walled tenement streets.

It should be borne in mind that stone stairs will not prevent smoke and heat rising up the stair well, and that, no matter what may be the construction of the stair, no human being can face the heat that would cause a wooden stair to burst into actual flame. Consequently, a wooden stair that will remain intact under all conditions is safer than any material that is affected by heat or cold.

The results of fires in different parts of the world have demonstrated most clearly that there has not yet been built any special class of structure that has withstood the ravages of a conflagration. It is difficult to say what constitutes a really fireproof structure. I think it may be safely concluded that, given a building of any material, and fill it with combustible stock, if that stock becomes thoroughly well alight and inaccessible to modern fire fighting appliances, the building will be destroyed. Metal construction has failed. Almost every variety of stone has proved to behave disastrously when exposed to a fierce fire; and of all building material, good, sound, and solid timber, though doomed in the end, has been found to withstand the effects of fire longer than iron or steel. One trait in its favour is that it is neither distorted nor deflected by the heat. A wooden beam must be consumed to the breaking point before it gives way. Sound and seasoned timber gives far greater security and stability to a building on fire, and permits of the fire being attacked from within.

As an illustration of this contention, I take the case of an ordinary tenement in Scotland. It is very rarely that a fire spreads from one floor to the next above, although the very commonest of building material is employed.

The exposed surface above the fire in the first place is common, and often inferior, plaster ceiling on wooden lathing nailed to the underside of the joisting. The joisting is rough, of the 9 by 3 standard. Then you get the deafening, a luxury rarely met with in English houses. The deafening is often non-inflammable, or of very slow combustion, but it serves the dual purpose of not only checking the fire but also blocking up the air spaces, and preventing the flow of air and flame between the joisting, and protecting the underside of the flooring of the flat above.

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[*] Abstract of a paper read by Mr. A. Pordage, Firemaster of Edinburgh, at a meeting of the Edinburgh Architectural Association.

This class of construction is, of course, of a very common order, in point both of quality of material and of workmanship. Tenements which are run up at the cheapest possible price do not admit of very much in the way of specially selected and seasoned material. The internal divisions and the method, rather than the material, are responsible for the rarity of large fires in tenement buildings.

For large external walls, stone has proved to be absolutely unreliable. In the early days of my career in the fire service in London, fires in the older warehouses of brick and timber construction were always followed up from floor to floor without consideration for falling floors and bulging walls; but the introduction of unprotected iron for supports and joisting alters the complexion of fires entirely. The deflection and buckling of the girders bulge and bring down the walls, and concrete slabs used as flooring frequently do more damage by wrecking than the actual fire.

Properly bonded brick, with good mortar, will withstand the fiercest fire; and, what is more noteworthy with regard to a brick wall, is that, after all the supports have either been burned or fallen away, the wall will remain in position for days after a fire. In one striking instance, a brick wall, 45ft. high, 40ft. wide, and 18ins. thick, was the only one of the many party walls which withstood the effects of the fire.

Brick is least affected of all material, and will withstand the exposure to a fierce fire and application of water many times without detriment to its stability. I have not found in my experience any other form of construction of which the same may be said.

Steel and wrought-iron columns, inadequately protected, have in many instances failed most disastrously, and in others they have succeeded in keeping other ironwork intact. A mere coating of concrete is not sufficient; there should be 2ins. or 3ins. securely anchored to the column and girder, as in all cases air spaces, pipes, and tubing should be excluded from the coating round ironwork. In fact, the coating should be solid. The expansion of piping and tubing bursts the coating and exposes the iron.

If concrete is of a satisfactory aggregate, and is thickly coated and anchored on to steel and ironwork, it is contended that unequal expansion of either material is almost impossible. I am of opinion that reinforced concrete of brick, slag, or cinder aggregate, is satisfactory for floor construction, and will withstand fire better than any other form of metal construction yet introduced.

We have not had very much experience yet with reinforced concrete, as it is practically a recent introduction; but in the great American fires of the last few years this particular construction has stood the test better than anything else.

In dealing with the fire-resisting properties of buildings, it is, of course, important that the construction should be such as will retard the spread of a fire from one section to another; and a word in the direction of the growing tendency towards extraordinarily high steel frame buildings may not be out of place. Our building regulations have so far kept the dimensions of these buildings within reasonable limits; but, owing to their apparent fire-resisting properties, there is an inclination to follow the American methods. Already in London there are several such buildings of ten and twelve floors. Buildings beyond 80ft. may be considered to be beyond the immediate resources of modern fire appliances. Consequently, when a fire occurs beyond that limit, it cannot be so readily attacked. It has longer time to get ahead before being reached, and the chances are that the fire will spread amongst the upper floors of adjacent buildings.

This class of building has a large surface of wall-opening enclosed by glass, which affords no protection from outside fires. It is due to this fact that great fires of Baltimore and San Francisco spread so rapidly. The fire, travelling with the direction of the wind, passed through the window openings, out of the top of one building into another, jumping over the spaces occupied by smaller buildings, which latter in many cases escaped entirely.

Taking the structures apart from the contents at the Baltimore fire in 1904, most of the frame buildings which were burned out in so far as the contents and fixtures were concerned, and whose skeleton frames remained, cannot be said to have behaved satisfactorily. The top floors which were inaccessible to the fire-fighting appliances, acted as fire conductors. Their stone and ornamental dressings were stripped by the effects of the heat, making the work of the firemen below extremely hazardous. An extract from the report of Chief of Engineers of the United States of America says: "The exterior walls of many of the so-called fireproof buildings ought to be taken down. All of them are more seriously damaged than appears."

We have to go to America for the best information on record about building material, and I propose to give a few extracts from the excellent report presented to the United States Government by a special committee appointed to report on the great fire of Baltimore in 1904.

The report says: "For exterior walls, both stone and terra-cotta suffered severely. The effect of fire on terra-cotta was a surprise. It was thought that architectural terra-cotta for external walls was reasonably fireproof, but it failed completely at this conflagration. It cracked and fell to pieces, and the heat seemed to destroy its texture. In some cases it became soft and pliable. More particularly was this the case with projecting and highly ornamental work."

With regard to internal fireproofing, the report says: "The only successful partitions were of brick, these lost their plaster but were otherwise undamaged. Coke-breeze or cinder concrete behaved admirably. In many instances where the flooring had not been subjected to damage by wreckage, the cinder concrete floor remained solid and intact." It is important, however, with regard to coke and cinder aggregates for concrete, that all combustible and partly consumed coal be rigidly excluded. I have experienced several instances where coke-breeze concrete has become incandescent.

In addition to its fire-resisting qualities, it has the advantage of being superior in lightness to all other forms of concrete.

Stone of every description suffered severely, particularly projecting parts. Terra-cotta facings and ornamental work failed completely. Granite spalled badly, worse than any other stone under moderate heat. Marble spalled badly, but not so much as the granite.

Of materials used in exterior walls properly bonded brickwork was the only thing that was really successful.

Nothing can convey more clearly the value of the fireproof construction in a fire than one of the quotations contained in the conclusions of the Special Committee of the National Fire Protection Associations of the U.S.A., which says: "It may be expected that in fires of great severity the steel frame, its protective covering, the walls and floor arches alone will remain, and even these will be more or less damaged according to the character of the construction and materials used."

"The contents of a fire-resisting building, without proper subdivision and with no adequate protection against exposing fires, are scarcely any safer as regards destruction by fire than if contained in a building of ordinary construction."

These conclusions, arrived at after careful and exhaustive enquiry in the results of the various building constructions, prove conclusively that the tall steel frame-built fireproof building acts as a fire conductor when the contents of the building are alight and get beyond control of the fire equipment.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable and it must be understood that both question and reply will, as a rule, be published in these columns

Cost of Office Buildings.

Glasgow.—"Investment" writes: "What would you suggest as a fair rate per cubic foot to approximate the cost of a large office block? The building would be of eight storeys and basement, built fireproof, and finished in a modern but simple manner. The offices would be in groups of two to five rooms."

—Such a block would most probably cost from eightpence to tenpence per cubic foot, varying with the degree to which equipment and finish is carried. F.S.I.

Illustrations of Lion Base.

Birmingham.—Lion writes: "I am anxious to obtain a small photograph or print of an Italian or Lombardic example of the lion base; also information as to where there are any mediæval examples in England."

—An illustration of the well-known 13th century pulpit of Siena Cathedral, which appears in Anderson's "Architecture of the Renaissance in Italy," shows several examples of the Lombardic Lion base. Good and cheap photographs of almost any detail of Italian architecture can be obtained from Alinari Bros., of Florence, to whom applicant is advised to state his wants. There are no mediæval examples in England. G.

Plaster Peeling Off.

Ireland.—C. K. writes: "A customer of ours is greatly troubled through several houses which he plastered with cement, throwing off the cement after a number of months. The bricks of which these houses are built are common red solid brick, made locally, and our customer tells us that they were thoroughly wet before the cement was put on. The cement is put on in two coats mixed with clean sand, in a proportion of two to one. It seems to us, and our customer has the same opinion, that this is due to a white fluffy substance which seems to come out of the brick and separate the cement from the wall, at the same time causing the surface of the cement next to it to become rotten. One gentleman whom we spoke to on the matter said he thought it was gypsum, which was in the clay the bricks were made of; another said it was magnesia. Have you ever heard of similar cases, and do you know of any remedy which would prevent the cement coming off, as in some cases it has come off three times on the same wall? The cement is of standard quality."

—Some bricks which are increasingly used in Ireland are of so dense a nature that it is almost impossible for cement to adhere to them, as there is nothing in the surface of the bricks which can act as a "grip" or "key." The cement is not thrown off because of the "white fluffy substance," nor by the presence of gypsum or magnesia in the brick. Similar bricks are well known in England. All that can be done when they are required to be faced with cement or

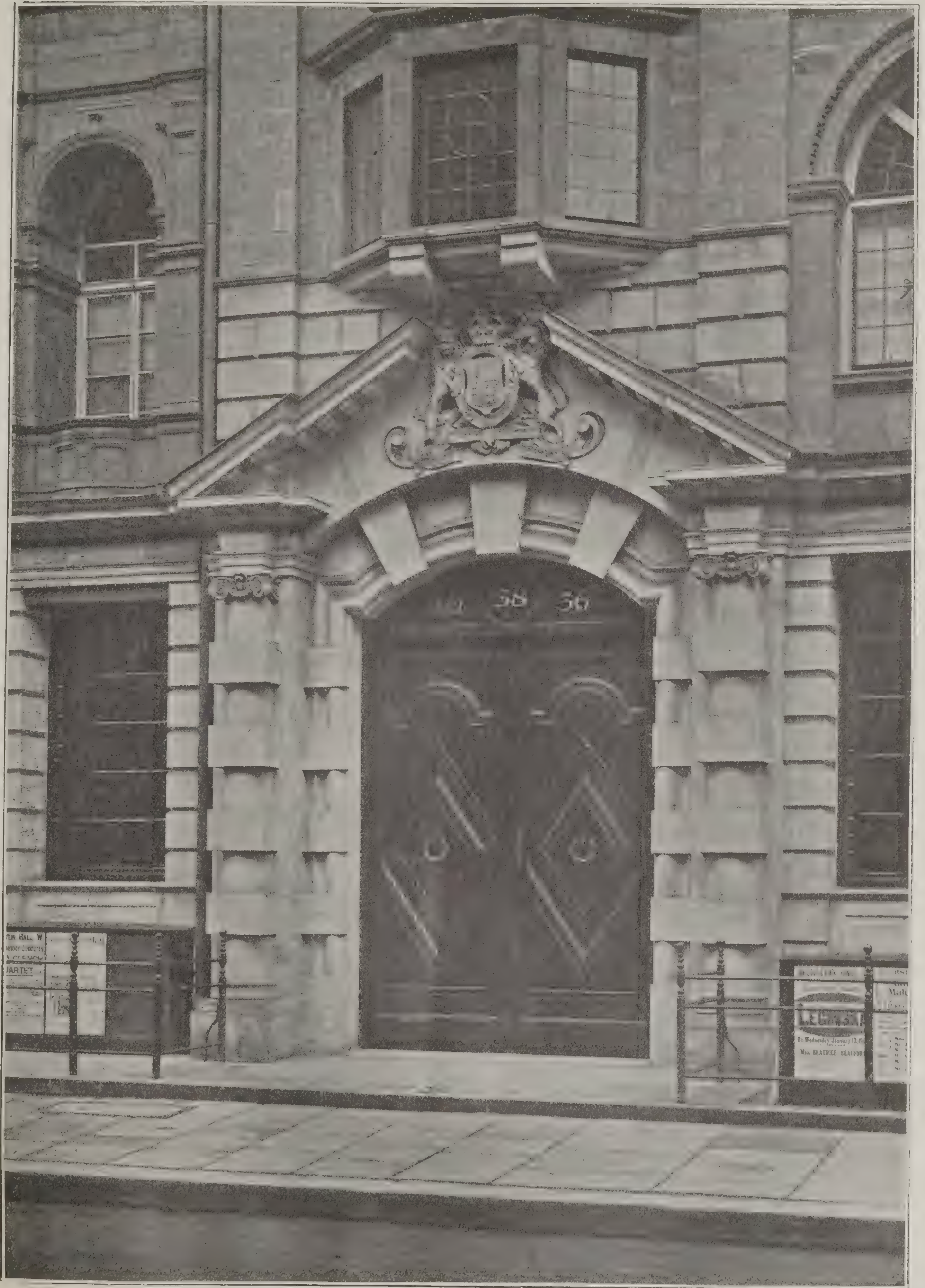

Photo: S. B. Bolas and Co.

ENTRANCE DOORWAY, PREMISES IN WIGMORE STREET, LONDON, W. WALTER CAVE, ARCHITECT plaster is to make them with grooves or keys in the face, so that the plaster or cement may adhere. This defect is so troublesome in some bricks made in the East of England, that many architects refuse to use them when plaster is required. The cause of the defect is that the particles of which the bricks are made are so close to each other—often cemented with a kind of glassy material formed in the burning—no pores are left into which the cement can run and easily adhere. Sometimes this density of texture is only on the surfaces of the brick, and the cement can then be made to adhere if grooves are chipped in the brickwork of a depth sufficient to reach the more porous material beneath the face of the brick. This process of chipping is, however, a costly one. There are several other causes which might result in the cement being thrown off such as the bricks being frozen when the cement is applied, or the cement and sand being improperly mixed; but the explanation of the trouble is most frequently to be found in the surface of the brickwork itself. Bricks of this character are usually so resistant to weather, that there is no advantage whatever in facing them with cement, and for stucco work, more porous bricks should be used.

Books on Church Design.

BURNLEY.—J. V. K. writes: "Could you recommend a good book or books on details suitable for a small country church?"

—Two papers on "Modern Church Building," read before the R.I.B.A., by Sir Charles Nicholson and Mr. Hubert C. Corlette, and reprinted from the Institute Journal, may be obtained at the offices of the Institute, 9, Conduit Street, W., price 3s. 6d. They are full of useful information and suggestions on practical points of detail in church planning and equipment. An interesting address on the æsthetics of the subject, delivered by Mr. E. P. Warren, F.S.A., at the annual Court of the Incorporated Church Building Society, was summarised in the "Builders' Journal" of May 26th, 1909. The requirements and suggestions of the society appear in the current issue of the "Architect's Compendium." A perusal of the foregoing should give sufficient information for the purpose, if practical points of detail (which alone can be effectively gleaned from books), are referred to by querist; if details of "Gothic architecture" are sought, J. K. Collings' books contain a wide selection of measured examples, and the late Edmund Sharpe's "Mouldings of the Six Periods of Gothic Architecture" is invaluable. The latter also published, in "Churches of the Nene Valley," numerous illustrations of details from the fine churches of that district; but the practice of transplanting detail designed for the local material of one district to another having quite different characteristics, is one to be deplored. Cannot querist obtain local inspiration?

Fireproof Floor.

A. H. (LONDON, N.W.) writes:—I have to convert the lower part of a two-storey building into a store house for somewhat inflammable materials (i.e., packing cases, etc.). There is no access from the upper floor to the lower part, but the floor of the upper story is an ordinary wood joist and boarded floor, ceiled on the underside in the ordinary way. The upper storey of the premises being in separate occupation prevents my getting on the top of the floor to pug it, and any material used must be applied from the underside and be in the nature of a fireproof ceiling. What do you advise?"

—As the upper part of the floor cannot be touched, the best method of making the floor fire-resisting without reducing the headroom is to remove the laths and plaster and replace it with expanded lathing, covered with Robinson's Adamant fireproof plaster. This will only retard the progress of a fire and cannot be considered as giving reliable protection to the upper part of the building; the most satisfactory method would be to put in a new floor entirely.

HENRY ADAMS.

Urban Council's Powers.

BARNSLEY.—A. M. writes:—"(1) Can an Urban District Council make by-laws to enforce the building of water closets to all new buildings (instead of privies and ashpits) and whether certain powers would have to be obtained from the L.G.Board. (2) Can an Urban Council enforce me to build new privies and ashpits in place of old ones now at front of houses—the above has been cited as a nuisance, also what Health Act would be used to make me do this."

—An Urban District Council acts under the usual by-laws approved by the L.G.B., and must accept those by-laws and no others. They cannot themselves make any new by-law without the approval of the L.G.Board. The answer to each of your questions is in the negative, provided of course that no nuisance exists. Everything turns upon this point, and if it can be proved that a nuisance does so exist, the owner can be called upon to remedy it (Public Health Act, 1875, section 91, etc.).

F. S. I.

Bending Joists.

BRENTWOOD, GALWAY.—A. C. writes:—"Will you give me your opinion upon the following? A 15in.×6in.×59lbs. steel joist 29ft. long, 26ft. span (Glengarnock steel) got bent laterally during transit (presumably) to the extent shown on sketch (not reproduced) and has been bent back cold, to almost straight. This joist is to carry a concrete floor 6in. thick, in which it is embedded thus. Do you consider that the joist has been weakened to any appreciable extent? The concrete is coke breeze 5 to 1 of P. cement. The expanded metal before use has rusted to some extent by being stored in a shed having open sides. Would it be advisable to brush it with a steel brush and oil it?"

—We do not think the joist would be much improved by such a small amount of bending cold, as it is made of mild steel and should be able to withstand much greater deformation. Of course it is somewhat different with large sections, especially a joist bent in the way this was, but it is usual nowadays to insist upon all small and large rods in reinforced concrete work to be bent cold. The only effect of the bending, with proper elastic material, is to increase the elastic limit and sometimes the ultimate strength, so that any reduction in sectional area is off-set.

Regarding the expanded metal, it would be advisable to remove as much of the loose rust as possible by means of a steel brush, but no oil or paint should be used; the concrete will completely protect the steel and even remove the rust by absorbing it into the surrounding concrete and painting or oiling is dangerous, as it prevents the concrete getting into close contact and thus protecting the steel. The coke breeze should not be used alone for the concrete, but should be washed first and a certain amount of sand mixed with it to render it more impervious by filling the voids. We advise the proportions to be 4 parts coke breeze, 2 sand, 1 Portland cement.

Books on Estate Work.

AMBLE.—"NORTH SEA" writes:—"Will you advise me as to the best books to study in connection with:— (1) The planning and laying out of small country estates for building purposes. (2) The drainage of, and the disposal of sewage from these estates. (3) Book-keeping: I should prefer such a treatise on elementary book-keeping as would best teach the principles of book-keeping to form a ground for builders' and contractors' work."

—(1) "Building Estates," by J. Maitland, published by Crosby Lockwood and Co., at 1s. 6d. (2) Sanitary Work in the Smaller Towns and Villages, by C. Slagg, published by Crosby Lockwood and Co., 3s.; Sewerage and Sewage Disposal, by Robinson, published by Biggs and Son, at 7s. 6d.; House-drainage, by Spinks and Blake, published by Biggs and Son, at 7s. 6d. (3) Book-keeping, by W. Snailum, published by C. J. Clay and Son, Ave Maria Lane.

F. S. I.

Roller Rink Floor.

LITTLEHAMPTON.—R. E. B. writes:—"I want to know how to lay a wood floor for roller skating; also the best wood suitable for the purpose."

—The usual method is to lay a concrete bottom, say, 4in. thick, composed of 1 part of cement, 2 of sand and 5 of broken brick, stone, etc., the top being brought to a true level. On top of this should be laid Anderson's impregnated felt about ¼in. thick, and then narrow battens of maple, laid in the direction of the traffic, that is, straight down the sides, diagonally at the corners and across at the ends. Or a hardwood dowelled block floor may be laid over the felt; say, maple, jarrah, karri, oak or pitchpine, may be used with a wrought face and then no polishing is necessary. HENRY ADAMS.

Liability for Fire Premium.

CARDIFF.—"K" writes:—"We are executing a contract for the erection of a public building for a public body, which we tendered for from their bill of quantities. The building recently needed insuring, and not having made any provision for same in their quantities as on their previous contracts, we took the matter up with the Council and received the following reply from them: "The Council does not undertake to insure buildings in course of erection, as contractors are liable to complete the work whether fire should take place or not.' The Council does not insist on us insuring as you observe, but as the premium was not a heavy one, we covered ourselves rather than take any risks. Had there not been quantities we should have had no cause for complaint, but under the circumstances we do not consider the stand taken by the Council a just one, as it practically puts us to the cost of insuring without being paid for it. We shall be glad of your opinion on the point, both as to the legal aspect of it and otherwise."

—I should say that the position taken up by the Corporation is correct, and that a contractor is liable in every way for his contract, and for every accident, except those specially excepted in the conditions of contract, until he delivers it over as a completed work and until it has been accepted at least "de facto" by occupation, if not formally in writing.

If the quantities supplied by the Corporation were made part of the contract, the builder would be entitled (in my opinion) to the item for insurance on a final adjustment of accounts. If the quantities, however, are not part of the contract, he would not be entitled to the item for insurance except as an act of grace. A. G. W.

Practising in Prohibited Area.

(Reply to P., Northants.)

A was articled to B, and in the articles there is the following clause:—

"A covenants with B that he the said A shall not without consent in writing of the said B at any time hereafter open any office or hold out himself as practising the profession of an architect and surveyor on his own account or as clerk to or in partnership with any persons in the town of C—or within a radius of six miles of the Parish Church of C—and in case the said A shall commit any breach of this covenant the said A will pay to the said B the sum of £200 as liquidated damages for such breach thereof."

Now A has taken an office outside the radius of the town of C—and, should he do any work within that radius although his office is outside of it, would he commit a breach of his covenant and be liable to forfeit £200.

It is reasonably plain that, in the circumstances above mentioned, A would commit a breach of his covenant, which is perfectly reasonable and capable of being enforced. It can clearly be stated, upon the authority of numerous cases, that to solicit or execute

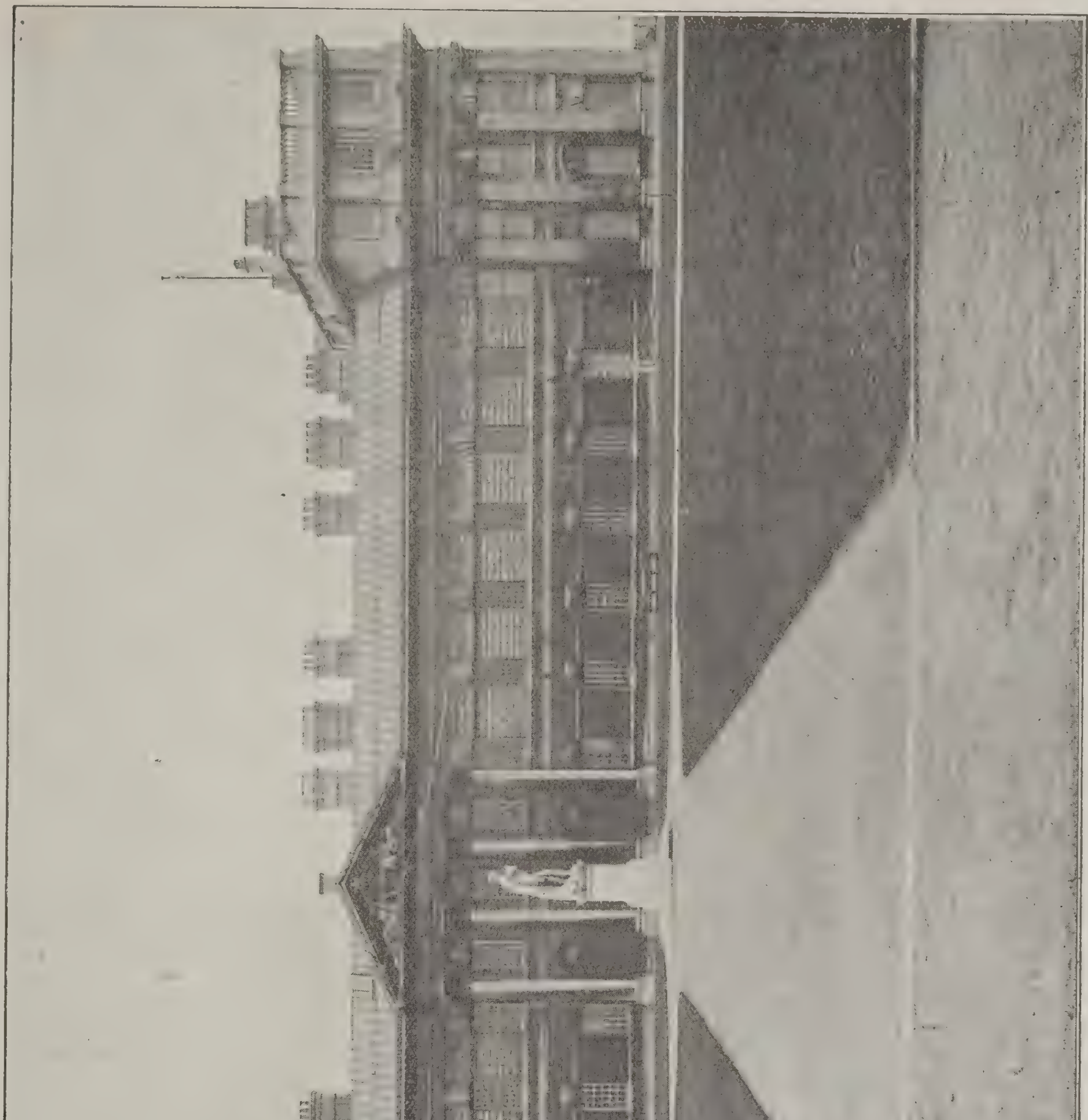

Photo: E. Dockree.

GREENWICH HOSPITAL: QUEEN MARY'S BLOCK. JOHN WEBB, ARCHITECT.

This is the original block built by Charles II. and stands on the west side of the great quadrangle. In the design Webb is supposed to have had the assistance of Inigo Jones.

orders in the prohibited area is to infringe a restriction covenant. In Turner v. Evans, 2 De G. M. and G., 740, the question was raised whether merely soliciting orders—e.g., sending travellers within the prescribed area—constituted carrying on a trade there, and it was held that it was. Again in Lake v. Harrison, 13 T. L. R., 568, it was held that a person who contracted not to carry on the business of a patent-agent within four miles of Chancery Lane, and who set up in business outside the radius could not conduct applications at the Patent Office. Upon these authorities, it is clear that A could not (*ergo*) superintend the building of a house inside the prohibited area.

B must wait, however, until he has evidence of an actual case of interference before he moves in the matter. He could then obtain an injunction in addition to payment of damages. B.

Testing Portland Cement.

LEWISHAM.—H. E. B. writes:—"With reference to testing the specific gravity of Portland cement by Messrs. Stanger and Blountflash, the displacement of oil is taken. I know oil is used to prevent the cement setting, but should not the sp. gr. of the oil be taken into account, as when one speaks of sp. gr. of a body it is compared with the weight of water of the same volume. Oil has not the same sp. gr. as water. I shall be obliged if you can enlighten me."

In determining specific gravity of Portland cement by the method referred to, account must be taken of the different specific gravity of oil as compared with water; of course, the specific gravity of the oil used must be known.

Bowling Green.

GREENOCK.—CONSTANT READER writes:—"A new bowling green was made seven years ago. The ground being on a slope was made up at one end and two sides with furnace ashes. The green has never been satisfactory, and the last time levels were taken it was found to be two inches higher in the centre than at the edges. The conclusion is that the banks of furnace ashes are consolidating and shrinking. How long should material of this description take to consolidate. Would a 6in. layer of stones, broken small, spread over the whole surface improve matters and keep an even surface, or would the weight of this material cause the ashes to sink more?"

—When a bowling green, or embankment of any sort, is made up to a level on sloping ground, there will always be a greater depth of unconsolidated material on the lower side of the hill and a tendency to greater shrinkage on that side. In this case the trouble appears more as if it were connected with the percolation of rainfall carrying away some of the salts and finer particles in the ashes towards the outside of the green. Another possibility is that the side slopes of the embankment were made too steep, and that they were now weathering down to their natural slope and lowering the surface. A layer of small stone spread over the surface does not recommend itself to the writer, but the middle might be rolled with a heavy roller and the slides made up an inch or so with fine vegetable mould and lawn sand. This would not involve a destruction of the present turfed surface.

HENRY ADAMS.

Rainfall at Manchester.

H. E. C. writes:—"What is the average annual rainfall in the Manchester district. What number of gallons of water is produced by one inch of rainfall per acre?"

—The average annual rainfall in Manchester is given as 35in. 1in. of rainfall gives 500 ton of water to the acre, there being 224 gallons to the ton. This would work out at 112,000 gallons to the acre.

Drainage By-laws.

LONG EATON.—A. B. C. writes: "A local authority refuses to pass plans showing a cesspool, the objection being that sewers are not laid. Are they justified?"

—The sanitary authority possess no statutory right to refuse to pass your plans merely because the waste waters from the proposed building do not pass into sewers, and I cannot imagine that they would attempt to do so If you consult that portion of the local by-laws which is headed "with respect to the drainage of new buildings," you will find full provision for such a case as this, and provided your drains comply with the requirements there laid down, the sanitary authorities have no option but to allow the building to proceed. F.S.I.

Laying Out Racing Tracks.

DUBLIN writes: "Can you recommend any book dealing with the laying out of cycling and running tracks?"

—I am not aware of any such text-book as you require, and should not advise anyone to lay out a cycle or running track without expert knowledge. The great secret of success, of course, lies in the thorough drainage of the subsoil, but there are many other details which make for success in such a matter. You may possibly obtain some information by addressing an enquiry to one of the journals devoting themselves specially to athletics. F.S.I.

Inspectorship and Other Posts.

SOMERSET.—S. H. writes: "(1) What are the qualifications for Inspector of Quarries? (2) Is it possible to obtain a post as building inspector, sanitary inspector, or inspector of nuisances, without special certificates? (3) Is there a periodical for clerks of works? (4) Where should one look for advertisements of vacancies for estate managers, etc?"

—(1) There is no such post as inspector of quarries. There are examinations held from time to time by the Civil Service Commissioners for posts as inspectors of mines and quarries, and a full prospectus can be obtained from them. Enquiries should be addressed His Majesty's Civil Service Commissioners, Burlington Gardens, London, W., and endorsed Inspector of Mines and Quarries. From the syllabus and papers the examination appears fairly elementary, but the oral is considered severe, and there are many applicants for few posts. Past examination papers are published by Messrs. Wyman and Sons, Ltd., Fetter Lane, E.C.

(2) It is impossible to obtain any remunerative post in the sphere our correspondent mentions, without obtaining the corresponding certificate. He should see the answer to a similar question by F. L., published in our issue No. 753, of July 14th last.

(3) The only periodical we know which is entirely published for the use of clerks of works is the Journal of the Clerks of Works Association of Great Britain, price threepence post free. The secretary of the association is Mr. J. Brady, 37, Sandyhill Road, Ilford, Essex.

(4) As to the best books in which posts as estate managers and overseers of works are advertised, we should certainly advise reference to the advertisement columns of the trade publications taken at the nearest public library. From time to time such advertisements occur in this journal, as well as in the daily papers, and occasionally in those periodicals devoted to country life and estate management. B. and B.

Appointments Abroad.

BERKSHIRE.—D. writes: "Please advise as to prospect of an architect's assistant obtaining employment in the British Colonies or Dependencies."

—There are a good many posts for architects' assistants in various parts of the Empire, but it is very unwise to go out until one has definitely obtained such a post, as the living abroad is expensive. The only way is to make enquiries of the Government Emigration Agents for the different Colonies and Dependencies, whose names and addresses can be found in the Post Office Directory, and to follow carefully the advertisement columns of this journal. The daily papers also occasionally contain such advertisements, but our correspondent should be careful to consider the cost of the passage to, and of the living at, and the healthiness of the particular place in question, in comparing the salary offered with that to which he would be entitled in England. He might also make enquiries of the secretary of the Architectural Association, 18, Tufton Street, Westminster. B. and B.

Thrusts in Masonry Dome.

LANCASHIRE.—RETLAW writes: "Please explain the stress diagram of the accompanying plan and section [not reproduced] of a masonry dome."

—Without some information as to the source of the diagrams submitted it is difficult to give any assistance, as they appear to be upon some special system. There is no accordance with usual practice. There is no satisfactory treatment of masonry domes in any book known to the writer.

HENRY ADAMS.

TOWN PLANNING CONFERENCE.

A two-days' conference on the practical administration of the town planning clauses of the Housing and Town Planning Act was opened at the Westminster Palace Hotel on December 14th, under the auspices of the National Housing and Town Planning Council. Alderman W. Thompson (Richmond, Surrey), the Chairman of the Council, presided at the morning session, and representatives of local authorities throughout the country attended, as well as of various societies and institutions, including the Royal Institute of British Architects, the Surveyors' Institution, the Incorporated Society of Municipal and County Engineers, the British Medical Association, and the Home Counties Association of Medical Officers of Health.

The Chairman said that the advocates of town planning now had a measure which lent itself to useful experiments that would show the precise nature of the amendments which would be needed before they obtained town planning in the fullest sense of the word. Running all through the town planning clauses was the question of how the various regulations, the general and special provisions of the Local Government Board, would be given effect to. Borough surveyors, architects, and engineers were already overburdened with work, and the new project was a vast one. In these circumstances they advised that the ratepayers should spend some money at the beginning in obtaining the very best skilled advice in the development of their towns. They also felt that the fullest possible encouragement should be given to that clause in the Act which provided for the co-operation of landowners.

The Council placed before the Conference as the basis for discussion a series of suggestions, on the preparation of which Professor Adshead (Liverpool), Professor Berlepsch-Valendas (Munich), Professor Eberstadt (Berlin), Professor Fuchs (Tubingen), Professor Patrick Geddes (Edinburgh), and numerous other gentlemen had given assistance. The suggestions of these gentlemen took the form of a skeleton plan setting forth the best course for a local authority to take in the administration of the new Act.

After a lengthy discussion a resolution was passed in favour of a Town Planning Committee being appointed by the local authority, and suggesting that "a limited number of persons specially qualified may be asked by the local authority to give advice on this point." The "clear statement of objects to be aimed at," it was agreed, should include the provision of parks and open spaces and the preservation of all places of beauty or of historic interest. It was agreed that it might be of value to call in the services of a skilled adviser to confer with the Committee to give technical advice, prepare statements, alternative suggestions, contour models of towns and surroundings, and to organise civic exhibitions.

Various other suggestions connected with the preparation of the town plan, the stage at which joint action between local authorities should be secured, and the special ob-

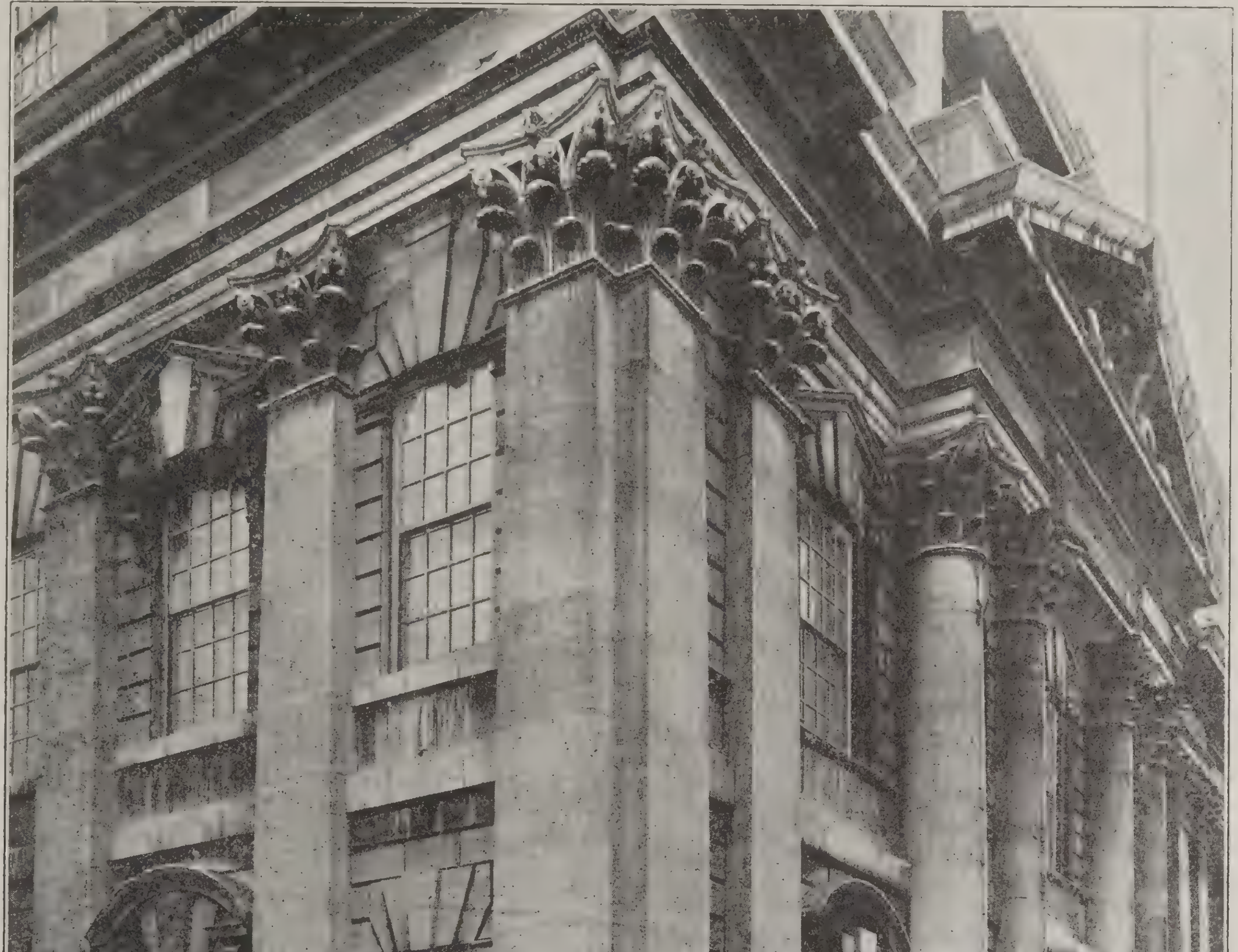

Photo: E. Dockree.

GREENWICH HOSPITAL: DETAIL OF QUEEN MARY'S BLOCK. JOHN WEBB, ARCHITECT.

This view shows the river front in sharp perspective, with a piece of the return front to the great quadrangle. The block stands on the western side of the quadrangle and is one of Webb's finest works. The corresponding block on the eastern side was built at a later date.

jects of the town plan were agreed to at the afternoon session, when Councillor Shawcross presided.

At the second day's sitting, the discussion showed general agreement with the suggestion of British and foreign experts that persons interested in the land proposed to be included in a town planning scheme should be called into conference at a much earlier stage than is done in Germany. When the Town Planning Committee of the local Council had clearly defined the general objects of the plan, those interested should at once be called into conference. Before this step was taken it was regarded as of fundamental importance that the Committee should have decided upon the policy which was in the best interests of the community. In the final stage of promoting a town plan the meeting was unanimous that at the public inquiry by the Local Government Board the help of citizens and associations interested in public welfare should be again enlisted for the purpose of giving evidence as to the amenities proposed to be secured for the community by the scheme. At this stage, it was suggested, the Council should have the warm support of all who desired to secure the proper growth of the town. For the first years of the administration of the new Act, the tradition which would govern the practice for the next thirty years would be created, therefore there was need for the expression of the right civic spirit by leading citizens outside the Council.

Alderman Bennett (Warrington) said he believed that even members of the Councils at present had only the most shadowy idea of what town planning meant. They had to overcome a good deal of ignorance and reactionary feeling, and to pursue active educational propaganda. Mr. Aldridge (secretary of the Town Planning and Housing Council) said that this body had already secured the help of Messrs. Lever, Cadbury, and Rowntree in the appeal for a fund of £5,000 with which to educate the people of the country in the possibilities of the Act. It was proposed to send a well-qualified man to address citizens on the subject.

Alderman Thompson (Chairman of the Town Planning Council) urged that they should impress upon the Local Government Board the extreme importance of allowing every local authority, without prejudice to larger action afterwards, the power of controlling the small areas for the protection of the public, in order that people should not rush through building plans for developing areas in the old haphazard way. He suggested that the Act gave power to a Council without waiting to prepare the elaborate scheme for the whole town, to make a hundred applications in respect of small areas.

Mr. Raymond Unwin thought that such a protective plan would be a very simple affair, quickly prepared, and that it would not prevent the Council from reconsidering the planning of the area when they made the scheme for the whole district.

The Conference agreed, after further discussion, that the attention of the Local Government Board should be called to the urgent need for devising at once some simple and effective procedure for protecting the community against the passing of street and building plans for the immediate development of areas on unsatisfactory lines before the town plan is made.

The cost of the town planning scheme and the necessity of its early consideration by the local authorities was spoken of by the Town Clerk of Blackburn, who said that the whole movement would be discredited in a town if, after a scheme was launched, the Council found themselves unable to retreat from a quagmire of compensation which would make the cost excessive.

Mr. Aldridge said he did not think that compensation to persons under the Act would involve much expense to the local authority. In Germany compensation was only paid when existing buildings were interfered with.

The Town Clerk of Rochdale thought it would be similarly limited under Mr. Burns's Act. The Conference agreed that good deal depended on the regulations issued by the Local Government Board.

Subsequently the Advisory Committee met to consider the points upon which representation is to be made to the President of the Local Government Board. There will be a Conference of borough officials in February on the technical administration of the Act, and in July there will be a Conference at the Institute of British Architects. During the International Housing Congress in May next it is proposed to arrange a tour of some Continental cities to study town planning.

LONDON COUNTY COUNCIL (GENERAL POWERS) BILL, 1910

The General Powers Bill to be introduced into Parliament in the session of 1910, deals with the following subjects that are of interest to builders and contractors:—

Street Improvements.—Power is sought to enable the Council to widen Church Street, Kensington, and to divert and widen Belvedere Road fronting the proposed new county hall. Power is also sought to require the Kensington Royal Borough Council to contribute towards the former widening.

Purchase of Lands.—Provision is made for the compulsory purchase of lands in Brookgreen Road, Hammersmith, for fire brigade purposes, and for the revival of powers for the compulsory purchase of lands in Lincoln's-Inn-Fields under the London County Council (Improvements) Act, 1899.

Smoke Nuisance.—Under this heading an amendment of Section 24 (*b*) of the Public Health (London) Act, 1891, is sought. That section provides that "any chimney (not being the chimney of a private dwelling-house) sending forth black smoke in such quantities as to be a nuisance," shall be a nuisance liable to be dealt with summarily under the Act, and it is sought to amend the section by the deletion of the word "black" and by the extension of the meaning of the word "chimney" so as to include openings through which smoke is emitted, which would not otherwise come within the scope of the section, and the chimneys of any building or place in which operations or processes are carried on under statutory powers, and also the chimneys of any Government workshop or factory. Power is also sought to enable the Council in special cases of nuisance arising under sections 23 and 24 of the Public Health (London) Act, 1891, to take proceedings at the request of and by agreement with the sanitary authority, and to enable the Council to take proceedings in respect of smoke arising from some cause outside the county of London. Provision is included to enable the Council to take proceedings against sanitary authorities in respect of smoke nuisance from any building or premises belonging to or used by sanitary authorities, and power is sought to enable the Council to expend such money as it may think expedient, not exceeding £500 a year, for the advancement of measures for the abatement of smoke nuisance.

Employment Agencies.—Under this heading the Bill provides that after January 1st, 1911, no employment agency shall be carried on unless licensed. Following the precedent of Part XI. of the London County Council (General Powers) Act, 1905, which deals with the registration of employment agencies, it is provided in the Bill that the Council shall be the licensing authority, so far as concerns the county of London, and the City Corporation the authority for the City of London. The Council's resolutions of May 18th-19th, 1909, contained no direction on this point, but we have assumed that the intention of the Council was that the position of the City Corporation should not be disturbed. Power is sought to enable the licensing authority to charge fees for the grant or renewal of a licence, and to make by-laws prescribing the books to be kept by persons holding licences, and any other matter which may be deemed necessary for the prevention of fraud and immorality in the conduct of any agency and for regulating any premises used for the purpose. Labour bureaux and exchanges and employment agencies conducted by a trade union or by a religious, philanthropic, or industrial institution otherwise than for private gain may be declared by resolution of the Council to be exempt from the provisions of the Bill. Employment agencies carried on as theatrical or music-hall agencies are exempted from the provisions with respect to the books to be kept and the entries to be made therein, and the inspection of such books and entries except in so far as such agencies are carried on for any other purpose.

Extension of Time.—An extension is sought for the completion of the widenings of Southampton Row, authorised by the London County Council (Tramways and Improvements) Act, 1903.

Power for the Camberwell Metropolitan Borough Council.—Power is sought to enable the Borough Council to acquire lands (i.) in Crystal Palace Road for purposes in connection with the public baths in that road, (ii.) in Toulon Street, with power to convey any part thereof to the trustees of St. Joseph's Roman Catholic school.

Miscellaneous and Financial.—Under this heading the Council seeks to be empowered to stop up part of Laxon Street, Bermondsey, and to appropriate for education purposes the site of the portion stopped up.

Fire Prevention Notes.

L.C.C. Fire Committee Notes. The London County Council Fire Brigade Committee has recommended for acceptance the tender of Messrs. Kerridge and Shaw for the erection of the superstructure of the extension of the chief station of the Fire Brigade. The tender, which is the lowest of twelve, amounts to £16,861. The highest is £18,059, and the architect's revised estimate of the cost of the work is £17,550. The committee recommend that in order to facilitate the descent of firemen from the upper floors to the appliance rooms, second handrails should be provided on the staircases at a further six fire-stations, namely, those of Hampstead, Homerton, New Cross, East Greenwich, Lewisham, and Dulwich. The Council on 20th July, 1909 accepted a tender to supply and fix, from time to time as required, not less than 1,000 and not more than 8,000 hydrant indicator tablets, at the following prices, viz., square single tablets, 11d. each; oval single tablets, 1s. 1d. each; and double or corner tablets, 1s. 4d. each, the price in each case including wooden blocks, iron stays, etc. The company now ask that they may be paid an additional sum of 3d. for removing the old tablet in each case in which a new tablet is substituted for an existing one, and 6d. for the same work where no new tablet is substituted. No provision was made in the contract for this work, and the committee think that the firm's request should be acceded to. Between November 22nd and December 6th, inquests were held into five cases of death from fire in London. All the persons who lost their lives, died or were removed from the premises in which the fires occurred before the brigade was called.

A Survival of the Great Fire. An interesting reminiscence of the Great Fire of London arises in a report of the London County Council Local Government, Records, and Museums Committee, who state that there has been brought to their notice a proposal of the Metropolitan and District Railway Companies to rebuild Mark Lane Station. The proposal includes a scheme to erect over what is now practically a ventilating opening, buildings to a height of from 26 to 34ft. As buildings of this height would seriously interfere with the view from the north side, of All Hallows, Barking, which is an exceptionally fine specimen of fifteenth-century Gothic architecture, containing much fine wood carving and many ancient monumental brasses, and one of the few churches that escaped the Great Fire of London, endeavours have been made to secure a restriction in height of the proposed buildings. At the instance of the Council, certain modifications have been made in the plans which will lessen to some extent the obstruction to the view of the church, and the committee have caused a letter to be addressed to the Corporation of the City of London expressing the hope that it will take any action it can to secure an unrestricted view of the church.

Protection of Hampton Court Palace. The First Commissioner of H.M. Works, etc., has requested that in consequence of criticism of the arrangements in force for the protection of Hampton Court Palace in case of fire, the chief officer of the London fire brigade may be permitted to make an inspection of the palace at an early date with a view to his advising the First Commissioner in the matter. Although a large number of Government buildings are at present periodically inspected by the chief officer, it has not been the practice for buildings outside the county of London to be so inspected, but in view of the special character of Hampton Court Palace and its national importance, the L.C.C. Fire Brigade Committee are of the opinion that the request of the First Commissioner should, as a special case, be acceded to. This is a wise step; but we cannot help thinking that the inspection should be made with the assistance of an architect. Judging from the building knowledge displayed by Mr. Pordage, Firemaster of Edinburgh, in the excellent paper printed in the present issue, fire officers apparently make it their business to acquire more than a mere smattering of building construction. It could be wished that architects would take their revenge more amply by giving full heed to the kind of information that is imparted so authoritatively and so agreeably in Mr. Pordage's paper; and the fact that an architectural society—that of Edinburgh—invited him to read it, encourages the belief that the desirability of obtaining first-hand information on fire prevention is becoming more clearly recognised by architects. Further co-operation of the kind should ensue. In such matters as that of the inspection of Hampton Court Palace, the fire officer may be expected to know most about the ways, and the architect most about the means of fire-prevention, and each can help the other in the revision of ideas. "Combine your information" used to be an axiom of educationists; and here is an opportunity of giving it force and effect.

Federation News.

LONDON MASTER BUILDERS' ASSOCIATION.

The Council met on the 9th and 16th December, 1909, when the President (Mr. F. G. Rice) occupied the chair.

Matters of an important character were discussed, and instructions given concerning them. The firms recommended by the Organisation Committee for election were adopted, and the Council felt that something should be done in connection with sub-contractors who wished to join the association as associate members. With those who are purely builders' merchants, there is no difficulty, but it was felt necessary to do something to enlist the cohesion of the sub-contractors in case of labour troubles. A declaration to be given was adopted, and a motion to amend the rules will be accordingly made at the next annual general meeting to meet these cases.

The quarterly financial statement was submitted, and considered together with the investment account. Among other items, cheques were drawn for the association's subscription for 1909 to the National Federation, and contribution for the same period to the National Federation reserve fund.

It was decided to eliminate from the list of members those whose subscriptions were more than two years in arrear, and from whom no satisfactory reply had been received to a recent communication.

The firm of Messrs. Minton, Robertson and Co. (chartered accountants) were invited to audit the accounts for the current year.

The Council gave further consideration to the case of a builder who is contesting the decision of an arbitrator, and gave instructions accordingly.

The president (Mr. F. G. Rice) reported that he accepted an invitation to attend the conference on the apprenticeship question at the Mansion House on December 3rd, and reported the proceedings to the Council. It was regretted that no employer representing the building trade had an opportunity to speak at this meeting. A gentleman who, apparently, was not present, was announced to speak on behalf of the building trade, but he was in no way connected with the London Master Builders' Association nor with the National Federation of Building Trade Employers. It would certainly be most desirable to enlist the sympathies and co-operation of the employers of the building trade if the movement is to be successful in our trade.

As a result of the conference with the Quantity Surveyors' Association, the Council decided to send a copy of the following resolution, come to at the time, to every member of the association:—

"That this conference disapproves of the practice of asking for tenders in competition for works of a substantial value without quantities, prepared by a fully qualified surveyor, being supplied, and is of opinion that such quantities should be supplied in all cases when competitive estimates are invited for works expected to cost £500 and upwards."

A deputation, consisting of the president (Mr. F. G. Rice), Mr. W. Shepherd, Mr. J. Randall, and Mr. G. Bird Godson, together with representatives of the National Federation, were received by the president and officers of the Royal Institute of British Architects on Monday December 13th, and discussed the question of bills of quantities being supplied. After a very pleasant interview, the deputation left with the assurance that the matter would be laid before the R.I.B.A. Council.

Mr. F. G. Rice and Mr. Wm. Shepherd spoke for the L.M.B.A., and Mr. Ernest J. Brown for the National Federation.

A communication from the London Association of Master Decorators was received, and it was decided to appoint the president and officers of the association to meet the Master Decorators.

Several questions of interest regarding trade practice were considered, such as demarcation of work and the Leicester arbitrator's decision as to plumbers' work.

The arrangements for the annual dinner in February next were left to the president.

Mr. L. Horner and Mr. G. Bird Godson were deputed to act with Mr. J. Carmichael in matters relating to the ventilation, etc., of the new offices in Kingsway.

The following committee was elected to consider alterations necessary in the rules of the association: The president (Mr. F. G. Rice), Mr. L. Horner, Mr. G. Bird Godson, Mr. J. S. Holliday, Mr. W. Shepherd, Mr. Frank May, J.P., Mr. F. Higgs, and Mr. F. L. Dove, L.C.C.

The following members were elected to represent the L.M.B.A. on the National Federation Council and Administrative Committee:—Council, the President (Mr. F. G. Rice), Mr. J. Carmichael, J.P., Mr. S. B. Depree, Mr. F. L. Dove, L.C.C., Mr. G. Bird Godson, Mr. L. Horner, Mr. J. S. Holliday, Mr. J. F. Parker, Mr. F. M. May, and Mr. A. W. Turnbull. Administrative Committee, Mr. B. I. Greenwood and Mr. W. Shepherd.

It was decided to inform the members of the L.M.B.A. that the rules relating to measurement of slating and tiling issued recently by the Master Slaters' Association had not been considered or approved of by this Council.

The meeting terminated after lengthy duration.

BIRMINGHAM ASSOCIATION.

Secretary: G. Henry Wright, F.C.I.S.

The Council of the Birmingham Building Trades' Employers' Association, at a recent meeting considered the proposals of the Amalgamated Society of Carpenters and Joiners, and the Associated Carpenters and Joiners' Society, for alterations and additions to the rules of the National Board of Conciliation. The proposed amendment of Rule 19, which relates to alteration of rules, was objected to on the ground that it failed to provide for notice being given, but empowered any board or branch at any time to move for alterations. Whilst it was admitted that the principle of the proposed new rule to make a representative on one Board ineligible to sit on another, had something in its favour, it was regarded as being impracticable for employers' associations, especially those in the smaller centres. The proposal to amend Rule 3 by increasing the representation on the National Conciliation Board, was also objected to, as was the proposal to amend Rule 4 by providing that "It shall be the duty of the aggrieved party to draw up the notice to the Centre Conciliation Board." The proposal to amend Rule 16 by providing that the arbitrator to be appointed by the Board of Trade should be a "permanent paid official of the said Board," was objected to for obvious reasons—not the least of which is the very limited choice the Board would have in selecting an arbitrator.

The Handsworth Urban District Council having drafted new by-laws for streets and buildings, a committee has been appointed to examine them, with power to act.

Notices have been received and considered from carpenters and joiners, bricklayers, and labourers, for alteration of the working rules, and counter-notices have now been served. The carpenters and joiners proposed that the whole of the Borough of West Bromwich should be included in the Birmingham area. It is now expressly excluded, and the association have given notice that the present rule should remain. A proposal has also been made that the wages of carpenters and joiners should be increased from 9½d. per hour to 10d.; but a counter-notice has been given that wages be reduced to 9d. As the local branch of the Amalgamated Society of Wood-cutting Machinists has become affiliated to the Amalgamated Society of Carpenters and Joiners in local trade matters, application has been made for separate representation by one delegate on the Local Conciliation Board, but the association have given notice that the rule remain as at present. In a note to the working rules, it is stipulated that skilled machinists and general sawyers are recognised, and in a reply to a notice for an increase of the wages of skilled machinists from 9½d. to 10d. per hour, and general sawyers and planing machine hands from 8½d. to 9d., the association has informed the carpenters and joiners that they propose to amend the note by providing that the wages of the former shall be the same as those of carpenters, and the latter one penny per hour less. All the notices received from the three branches of operatives propose a substantial amendment to the overtime rule by omitting the words, "at the request of the employer," and also the words: "Overtime shall not be paid until a full ordinary day has been worked, except in cases over which the workman has no control, or time lost, owing to inclement weather." In a counter-notice, the association have proposed that the rule should remain as at present, with the addition of the following words:—"For the purpose of this rule, ordinary working hours shall mean five o'clock all the year round for the first five working days of the week.' The present rules with labourers provide that the rate of wages for builders' labourers shall be 6½d. per hour, and for leading scaffolders 7d. per hour. The Operative Labourers'

Societies have given notice to alter the rules so that the wages of builders' labourers shall be 7d., and of all scaffolders 7½d. The present rule does not apply to excavators, but the operatives propose that the term "builders' labourers" shall embrace "all labourers engaged in the erection, demolition, or repair of buildings, or sewage work, such as bricklayers', plasterers', masons', joiners', plumbers', painters', and slaters' labourers, excavators, millmen, timbermen, and concretors. In response to this the Association have given notice that the rule remain as at present.

SHEFFIELD ASSOCIATION.

Secretary: Thos. Smith.

The question of walking time, on which several joint meetings have been held with the operatives, formed the chief subject of discussion at the meeting of the association, held on November 11th, under the presidency of Mr. Mears. The matter had been thoroughly threshed out by the committee, who recommended the association to accept the proposal contained in a letter from the operatives dated October 21st, viz.: "That 1s. per week shall be allowed for car fares to all men working on jobs over 2½ miles radius from the Sheffield Parish Church, up to 4 miles, men to be on job at the usual starting time." Wages to remain as at present, subject to the addition of the words in the portion within inverted commas: "This rule does not apply to men set on on the job." The committee also recommended the association to confirm its resolution of June 10th, viz.: "That lodging money at the rate of 6d. per night be paid to men sent from the contractors' place of business to work on jobs over 4 miles from the Sheffield Parish Church, except in cases where by mutual agreement it is considered advisable that railway or tram fares in and out be paid in lieu of lodging money, conditionally upon the men being on the job at the official starting time; no lodging money to be paid to men set on on the job." The committee also further recommended the further confirmation of resolution whereby bricklayers would give or take one hour's notice on leaving, the whole of the resolutions in their entirety to be forwarded to the operatives as a full and complete settlement of all questions raised on the notices of the association of September 1st, and the counter-notices from the operatives.

After a short discussion the association unanimously adopted the recommendations of the committee, and the secretary was instructed to forward it to the operatives. A reply has now been received from the secretary of the Operatives' Trades Committee, saying that the suggestions are not acceptable to them, and that he is placing the matter before the operatives' section of the Local Conciliation Board, with a view to the matter being considered at a joint meeting as early as possible.

It is hoped that the Conciliation Board will be able to adjust the little difference which now divides the parties.

GREAT YARMOUTH ASSOCIATION.

Secretary: Robert J. Hill.

The twelfth annual meeting of the Great Yarmouth Master Builders' Association was held on Tuesday evening, November 30, at the Crown and Anchor Hotel, Hall Quay, Great Yarmouth.

The balance-sheet for the past year was considered to be very satisfactory in the circumstances.

The Secretary reported a saving on the year's working of about £5. He regretted that during the year the meetings had not been attended as they should be, and urged members to attend more regularly during the coming year, as a secretary could not do his work without the co-operation of its members. He announced his intention of resigning the secretaryship, but was persuaded to continue.

On the Secretary's initiative, discussion took place as to the best methods of carrying on the Association, and of securing better attendance, and his suggestion that papers and discussions on matters of practical interest should be arranged, was received with approval.

The following officers were then elected: Councillor F. Grimble, president; G. Chasteney, vice-president; J. Ward, treasurer; Messrs. E. Moore and G. H. Wright, auditors; R. J. Hill, secretary. Committee, Messrs. B. Moore, C. Wiseman, R. Carter, A. Gunns, B. G. Beech, W. T. England, W. Wright, J. D. Harman, L. G. Hadingham.

The secretary was requested to call a committee meeting at the earliest possible time for the purpose of revising the rules for recommendation to a general meeting.

LEEDS ASSOCIATION.

Secretary: J. Davidson.

A meeting of the Leeds Master Builders' Association was held at the Grand Central Hotel, Leeds, to hear an explanation by Councillor G. F. Bowman, on the relative value of the sites for the proposed Agricultural Hall for Leeds. Mr. J. Pickard presided.

Mr. Bowman read a paper pointing out the advantages and disadvantages of the Camp Road and Quarry Hill sites for the proposed Agricultural Hall, in the course of which he advocated the latter site. He contended that the erection of an Agricultural Hall on the alternative site would raise the value and tone of the Corporation property in that district. If the value of the property and the land in the undeveloped area were raised one shilling a yard, it would pay for the cost of the hall.

In the course of a long discussion, Mr. W. H. Dews said the new site was near to the gasworks, and he asked if it was intended to remove those works. There was also the objection that some time must elapse before the scheme could be completed.

Mr. Bowman remarked that it was not intended to move the gasworks, but there were new processes of making gas being adopted, which would remove that objection. Powers would have to be obtained for the erection of the hall on the alternative site. The great object was to get the right scheme.

Mr. Dews remarked that the scheme was too large to be decided upon in a quarter of an hour's discussion, and he could not vote for or against it without further consideration.

Some discussion arose with regard to the restrictions imposed for the housing of the people who were turned out by the destruction of the property, and the provision for lodging-houses.

Mr. Bowman replied that some of the restrictions had been removed, and he thought they would obtain full liberation.

Mr. W. T. Ledgard, in moving a resolution that they looked favourably upon the alternative scheme, said it ought to have the serious consideration of the citizens. The Camp Road site was not the right place on which to erect the Smithfield Hall, because they would have to spend more money on improvements. A million of money had been spent in the other district, and it should be developed to the greatest extent. Mr. I. Atkinson seconded.

Mr. Thomas Clarke suggested that the meeting should condemn the Camp Road site, but this met with no support.

The resolution was carried with one exception, and a vote of thanks was accorded to Mr. Bowman for his paper.

During the afternoon Mr. Bowman submitted his scheme to the Council of the Leeds Architectural Society, and although no resolution was adopted, the feeling is said to have been favourable to the scheme, and that it was deserving of serious consideration.

HARTLEPOOLS ASSOCIATION.

The annual meeting of this association was held in the Oddfellows' Hall, York Road, West Hartlepool, on Monday, December 6th. Mr. W. M. Thompson presiding over a good attendance of members.

After the meeting had considered the circulars from the Federation respecting the dispute with the quarry-owners and their workmen, and also with respect to the proposed conference between the National Federation and the Institution of British Architects respecting conditions of tendering, the annual report and balance sheet for the year were received and adopted.

The balance-sheet showed a gain on the year's working of over £8, and the amount in hand at the end of the year was considerably over £200. The meeting decided to contribute towards the fund being raised with a view to inviting the National Federation to visit Newcastle in 1911.

It is stated that at the beginning of the year an agitation was begun with a view of trying to get more equitable terms for sub-contractors, and after long negotiations, a form was approved, and a supply procured for the use of the members. It has long been felt that some alteration should be made so as to remove the inconvenience caused by the many varied working hours of the different branches in the building trades, some of the workmen commencing at six and some at 6.30, some ceasing at 4.30 and others at five, some having breakfast before starting in the winter months and others stopping for the meal.

Unofficial negotiations took place between representatives of the Workmen's Societies and representatives of the Teesside and District Masters' Association, and a settlement was almost accomplished without resorting to giving official notice to the Conciliation Boards. This settlement just failing, official notices were given for uniformity of working hours and other alteration to working rules, and it is confidently hoped that the desired amendements with respect to the hours of labour will in the immediate future be agreed upon, and be in operation.

The levy to cover the association's share of the cost of administration of the affairs of the National Northern Centre, Northern Federation, Teesside Association, to which bodies it is affiliated, and to cover its own expenses, was fixed at 4s. per £100 wages paid.

Mr. J. W. Moore was unanimously elected as president for the ensuing year, with Messrs. John Proud and E. M. Tweddle vice-presidents. Mr. E. Moody, secretary and treasurer. Messrs. G. H. Jackson and S. Pearson, auditors. The committee being: Messrs. E. D. Barker, T. Corbett, R. Mothersdale, W. Pearson, A. Stephenson, J. A. Tweddle, W. Thompson, F. R. Turnbull and J. B. Wilson. Messrs. Thos. Beetham, W. Pearson, and Robt. Watt are the trustees of the association. Representatives to the Teesside Association and the Northern Federation were also elected.

The members at the close of the meeting accorded a very hearty vote of thanks to the retiring president, Mr. W. M. Thompson, for the excellent and painstaking manner in which he had discharged the duties of this office during the past two years. Mr. Thompson suitably responded, and expressed the hope that more members would take a keen interest in the work of the association, and aspire to the important position which he had just vacated.

Insurance.

Free £500 Accident Insurance Coupons have this week been sent to the following:—

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Aldeburgh (Suffolk).—Accepted for alterations to water tower and new tank, for the Waterworks Committee of the Town Council:—

Goddard, Massey and Warner, Nottingham, £1,359 1s. 8d.

Axminster, Devon.—Accepted for a block of semi-detached cottages on the Hakes Building Estate, Axminster, Devon. Symes and Madge, architect, Chard:—

Newbery and Sons, £640.

Barnet.—For alterations to the new fire station, for the Urban District Council:—

J. Stewart, Tottenham	£652	0	0
Belton, Cockfosters	547	10	0
Pearson and Son	492	15	0
J. Braughen, Barnet	459	0	0
W. James,* Hadley	455	0	0

Extra, if wood blook floor and not cement:—J. Baughen, £7; Pearson and Son, £18; W. James, £8; J. Stewart, £18 10s.

*Accepted.

Blackhill (Durham).—Accepted for proposed new villa at Number One, Blackhill. Mr. John J. Eltringham, architect, Derwent Street, Blackhill:—

Ayton and Sons, George Street, Blackhill, Co. Durham, £678 10s.

Cardiff.—Provisionally accepted for proposed juniors' building, North Edward Street, for the Cardiff Y.M.C.A. Messrs. Speir and Beaven, Borough Chambers, Wharton Street, Cardiff, architects:—

E. Turner and Sons, Cardiff, £3,798.

Hull.—For the necessary work to be performed in erection of a school in Sidmouth Street, for the Education Committee. Mr. Joseph H. Hirst, city architect:—

Jackson and Son, Witham	£20,107	8	3
P. T. Kettlewell, Trinity Street	19,888	0	0
G. Houlton and Son, Baker Street	18,600	0	0
T. Goates and Son, Brunswick Avenue	18,450	0	0
J. T. Levitt, Holderness Road	18,350	0	0
W. Sanderson, Temple Street	18,279	0	0
Ltd., Sculcoates Lane	18,052	0	0
Quibell, Son, and Greenwood,			
J. H. Fenwick, Albert Avenue	18,030	0	0
M. Harper, Brunswick Avenue	17,929	5	0
G. H. Panton,* Anlaby Road	17,489	0	0

Rest of Hull.

*Accepted.

Llanfihangel-Glyn Myfyr (Denbigh).—For erecting a schoolmaster's residence, for Denbighshire Education Authority. Mr. Walter D. Wiles, county architect, 42a, High Street, Wrexham:—

W. T. Thomas	£655	4	7
H. Owen	550	0	0
Jones and Son	543	0	0
T. Thomas,* Maerdy	527	15	0

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London.—For erection of the superstructure of the extension of the chief station of the fire brigade, for the London County Council:—

Leslie and Co., Ltd., Kensington Square, W.	£18,059
W. Johnson and Co., Ltd., Wandsworth Common, S.W.	17,990
Higgs and Hill, Ltd., Crown Works, South Lambeth, S.W.	17,934
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J. Mowlem and Co., Ltd., Grosvenor Wharf, Westminster, S.W.	17,150
H. L. Holloway, Church Street, Deptford, S.E.	17,067
J. Carmichael, 331, Trinity Road, Wandsworth, S.W.	17,547
Kirk and Randall, Warren Lane Works, Woolwich, S.E.	16,866
Kerridge and Shaw,* 28, Sturton Street, Cambridge	16,861

Architect's revised estimate, £17,550.

*Recommended for acceptance.

Llandyssul.—For the erection of a residence, near Llandyssul, for L. T. Thomas, Esq. Haulage, stone, sand, and part slates found by owner. W. D. Jenkins, F.S.I., A.R.I.B.A., etc., architect, George Street, Llandilo, S. Wales.

James Davies, Ffostrassol	£670
John Thomas, Llanpumpsaint	623
Thomas Jones,* Llangranog	605

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(Tenders continued on page viii.)

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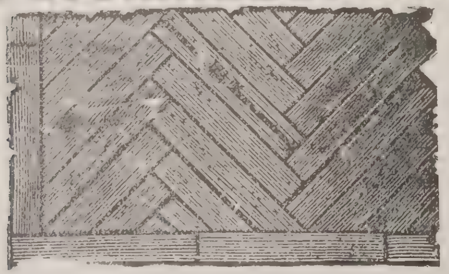

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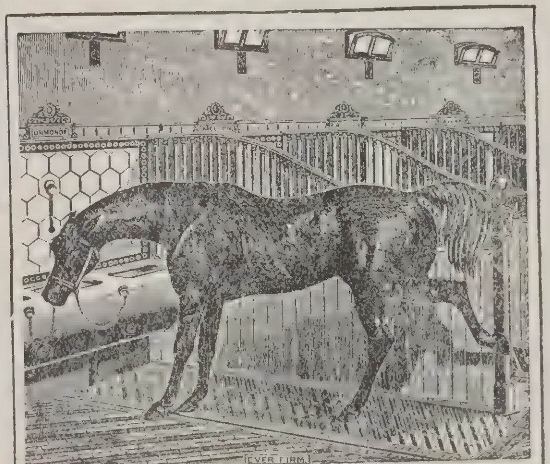

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(Tenders continued from page vi.)

London, N.E.—For provision of lunacy wards in pavilion "B" at infirmary, Homerton, N.E., for Hackney Guardians. Mr. W. W. Finch, architect, 76, Finsbury Pavement, E.C. Quantities by Mr. G. T. G. Wright, 5, Great Winchester Street, E.C.

Markham and Markham	£2,611
A. Monk	2,465
Wilkinson and Co.	2,424
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W. Pattinson and Sons, Ltd.	2,395
B. E. Nightingale	2,389
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J. Stewart	2,360
Sheffield Bros.	2,350
Stapleton and Sons	2,299
E. Lawrance and Sons	2,298
Kirk and Randall	2,121
Thomas and Edge	2,070
W. Lawrence and Son	1,992
Barrett and Power,* St. Thomas's Works, Hackney, N.E.	1,987

***Accepted.**

London.—For new school, Sherrington Road, Greenwich, for the London County Council:—

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W. Downs, Hampton Street, Walworth	14,655
Treasure and Son, Ltd., Cottenham Road, Holloway	14,649
F. and T. Thorne, Isle of Dogs	14,343
J. Marsland and Sons, York Street, Walworth	14,319
H. L. Holloway, Church Street, Deptford	14,282
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W. Akers and Co., Ltd., 13, High Street, South Norwood	14,228
F. and H. F. Higgs, Hinton Road, Herne Hill	14,219
T. D. Leng, Evelyn Street, Deptford	14,150
J. and C. Bowyer, Ltd., Upper Norwood	14,096
Kirk and Randall, Woolwich	13,985
Thomas and Edge, Anglesea Avenue, Woolwich	13,896
J. Smith and Sons (Norwood), Ltd., South Norwood	13,858
W. Johnson and Co., Ltd.,* Wandsworth Common	13,212

Architect's (Education) estimate, £14,456.

*Recommended for acceptance.

Middlesbrough.—For the erection of the new public library. Messrs. Russell and Cooper, F.R.I.B.A., architects, 11, Grey's Inn Square, London.

George Radge, Normanby S.O.	£14,130	0	0
E. F. Davidson and Miller, Newcastle	13,279	0	0
W. Nicholson and Son, Ltd., Leeds	13,133	1	9
D. Doughty and Sons, Middlesbrough	13,035	0	0
J. Howe and Co., West Hartlepool	12,875	0	0
Robert Wilson, Barnard Castle	12,694	1	1
Hudson Bros., Middlesbrough	12,550	0	0
S. Coates, Ltd., No. Ormesby	12,535	13	2
Thomas Lumsden, Jarrow-on-Tyne	12,232	0	0
Quibell, Son and Greenwood, Hull	11,857	9	0
Allison Bros., Middlesbrough	11,799	11	6
H. Arnold and Son, Doncaster	11,766	0	0
Paul Rhodes, Leeds	11,597	0	0
H. McNaughton,* Middlesbrough	11,566	8	0

*Accepted

Newton Abbot.—For a Council new mixed school, for 240 children, including covered playgrounds, offices, boundary fences, tar paving, etc., at Wolborough, for the Devon County Education Committee. Mr. Percy Morris, county architect (education), 1, Richmond Road, Exeter. Quantities by Mr. S. W. Haughton, 22, Courtenay Street, Plymouth.

J. J. Stokes	3,710	13	11
R. E. Narracott, Torquay	3,599	14	10
F. J. Zealley	3,583	10	9
J. Honour and Son, Tring	3,529	15	0
H. C. Goss, Torquay	3,301	13	7
J. Triggs, Exeter	3,290	15	2
A. N. Coles, Plymouth	3,288	18	1
N. Pratt, Clyst St. Mary	3,234	8	5
Lapthorn and Co., Plymouth	3,194	0	0
J. J. Lacey and Co., Exmouth	3,180	19	6
G. Arscott and Son, Buckfastleigh	3,138	19	1
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F. J. Stanbury, Devonport	3,075	19	1
G. Pollard and Co., Ltd., Taunton	3,056	16	7
F. C. Francis, Teignmouth	3,032	1	8
H. Mills	3,000	0	0
W. Reeves and Sons, Totnes	2,993	15	1
Pethick Bros., Ltd., Plymouth	2,993	0	0
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F. A. A. Stacey	2,933	0	0
Wakeham Bros., Plymouth	2,932	14	8
H. C. Jackman, Torquay	2,836	2	3
E. P. Bovey and Sons,* Torquay	2,825	0	0

*Reserved for acceptance.

Rest of Newton Abbot.

Pyle (Bridgend).—For erection of two houses, for Messrs. Williams and Davies. Mr. J. A. James, architect, Port Talbot.

J. Davies	£635	0	0
E. A. Thomas	616	0	0
W. Hopkins	585	0	0
J. Howell	562	0	0
R. Rees	550	0	0
J. Evans,* Port Talbot	525	0	0
Esias and Davies	513	8	6

*Accepted.

Plymstock.—For Council new mixed school for 260 children and cookery and manual training centre, including offices, covered sheds, boundary fences, tar paving, etc., for the Devon County Education Committee. Mr. Percy Morris, county architect (education), 1, Richmond Road, Exeter. Quantities by Mr. S. W. Haughton, 22, Courtenay Street, Plymouth.

G. B. Turpin	£4.767	0	0
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W. T. Stevenson	4,435	0	0
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A. Andrews	4,200	0	0
F. Miskin, Ltd.	4,162	19	5
F. Bartlett	4,117	0	0
H. J. Allen, Devonport	4,030	4	2
Lapthorn and Co.	3,990	0	0
H. Drew, Paignton	3,984	0	0
J. Crockerell, Devonport	3,980	6	4
W. E. Bennett, Bodmin	3,889	13	6
J. Paynter	3,862	1	3
Tozer and Son	3,808	19	6
E. E. Endicott	3,797	1	10
S. Roberts, Ltd.	3,768	5	9
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R. G. Williams,* Holbeton	3,613	8	10
E. J. Badcock, Ashburton (withdrawn)	3,577	0	5

Rest of Plymouth.

***Accepted.**

Romford.—For erection of a new boiler house and Lancashire boiler, with Galloway tubes, at the Workhouse, Romford, for the Guardians. Mr. H. Harrington, A.R.I.B.A., architect, 65, Bishopsgate Street Without, E.C.:—

Dowsing and Davis, Mawneys, Romford	£1,234	0	0
F. and A. Wilmott, High Road, Ilford	1,220	0	0
Adjustable Cover and Boiler Block Co., Ltd., 64, Victoria Street, Westminster, S.W.	1,219	15	0
J. S. Hammond and Son,* Romford	1,194	0	0

***Accepted.**

Sleekburn, Northumberland.—Accepted for the erection of a new vicarage and parish room, and boundaries, etc., at Sleekburn, Northumberland. Mr. A. B. Plummer, F.R.I.B.A., dioceson architect:—

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Shops in the Grand Manner. If, under modern conditions, the small trader is doomed, so, *ipso jacto*, is the small shop. The erection of the Selfridge Store is only one of many portents of the force of the new movement. That the impulse and the inspiration should have come from America is not surprising, a large and new country being naturally addicted to the conception of large and new ideas, and the temper and spirit of the people being impatient of conservative traditions, and apt in the initiation of courageous enterprise. That America is beyond all others the home of the big business building is most strikingly shown in the examples illustrated in our special issue, in which, we venture to believe, will be found much that is worthy of the most earnest attention of British architects, who now find themselves face to face with the necessity of dealing with the new conditions. In this country, the expansion of business is not always met in a free and bold spirit. The prosperous proprietor often seems to lack confidence in his good fortune. Instead of building up to it, he is contented with acquiring the premises next door, and he keeps on doing this until his premises are, architecturally, a "heterogeneous conglomeration of irreconcilable antagonisms." To wait patiently until your neighbours' leases fall in, and then buy them out, may or may not be a cheap way of gradually acquiring a large site for the big building that ultimately becomes inevitable, but a bolder and more wholesale operation would save much valuable time, would perhaps come cheaper in the long run, would offer less temptation to rivalry by bolder spirits, and, above all, would give fairer opportunities to the architect and builder, while sparing the general public the infliction of patchwork premises. That the shopkeepers of Paris are more akin to the Americans in largeness of conception, a further indication has just come to hand with respect to the first of the great emporiums of the Gay City. The Bon Marché is situated on the left bank of the Seine, in the unfashionable quarter, and its proprietors have been long hankering for a site in the centre of the boulevards, where it would make a more potent appeal to wealthy patrons, "especially foreigners," we are told, and of these no doubt the majority are Americans, whose ideas on the great "stores" question are likely to be taken into most careful consideration. Thus we get an interesting example of international reciprocity. It is stated, with reservations, that the proprietors of the Bon Marché have just accomplished a great *coup* in the purchase of the Grand Hotel and the surrounding establishments, including the Café de la Paix, for £2,200,000—perhaps the most commanding site in Paris. If this rumour is true, we are apparently on the eve of stupendous building developments, not only in Paris, but in the capitals of other countries in which so potent an example is sure to be followed as closely as circumstances will allow. It will be, we doubt not, in every respect a noble example, embodying the utmost architectural skill; and architects the world over will await with the greatest interest the confirmation of a scheme that promises almost unexampled opportunities for the combination of artistic grace and business utility.

Italian Gothic. In the "Contemporary Review" for December, Mr. L. March Phillips has a scholarly article on "Gothic Architecture in Italy." The writer has for his chief aim a refutation of the conventional belief that Italian Gothic architecture is "a mere feeble and spiritless imitation of the Northern style, and nothing more." This commonplace of criticism betrays, he thinks, a certain lack of sympathetic understanding. He scouts Fergusson's off-hand remark — since adopted as an article of faith by most Gothicists—that the Italians display "ignorance of the true Gothic feeling," and hints that most of the ignorance that comes into the question is imported by the critics. The Italians were not ignorant imitators; they were conscious adapters. "Italian Gothic evidently knows very well what it is about." It prefers breadth to height, the horizontal line rather than the vertical, and it assumes shape accordingly. This is clearly not ignorance, but self-assertion, representing a racial divergence as between the Latin and the Germanic strains of blood. The writer mentions a few of the "summary dealings" of the Italians with the vertical principle: "Externally the lines of boldly projecting buttresses and flying buttresses mounting in leaps to the abutment of the roof are, in the Northern style, one of the most forcible means of expression of its vertical character. In Italian Gothic these buttresses are either non-existent or are flattened to mere shallow and slight projections. Again, in the Italian style round-headed arches are as frequent as, and are often intermixed with, pointed ones," and while the spire is "the final aspiration of the Teutonic soul," it is in Italy almost always rejected in favour of the dome. The Gothicist will probably protest that these data explain but do not excuse Italian Gothic. Indeed, the author admits that "Italy possibly was mistaken in having any dealings with the style at all," although "Gothic had been adopted in the North with a fervour of conviction which made its influence difficult to resist." It is refreshing to read so judicial and philosophical an article on so controversial a topic; and its appearance in the pages of the "Contemporary" is significant of the revived interest in architecture and the arts.

An Art Essential. The search for the right road in art is perpetual. Luckily no final revelation is possible, and so the pursuit is of endless interest. Mr. Reginald Hallward, speaking on "Essentials in Art" the other day, had a large and distinguished audience, who evidently expected that so individual an artist would regale them with an unhackneyed treatment of his subject. Nor were they altogether disappointed. If Mr. Hallward did not evolve any new truths—which, indeed, were too much to expect from any mere mortal—he nevertheless gave piquant expression to some that are quite old, even if they are not all quite so familiar as the ideas about art that are more generally current. The artist declined to join in the discussion that has followed an exhibition of his own pictures, declaring, with becoming modesty, that the question of the essential principles of art is a much bigger one than anything appertaining to himself, because it is as old as the sculptures of ancient Egypt and Greece. It is probably much older than that, but it is as well not to push these things to extremes, and the speaker's artistic restraint is to be admired and commended. Then he straightway fell foul of the fetish of fashion. As he put it, we are weighed down by the materialism of contemporary life. Doubtless; but does not strong genius always, late or soon, rise superior to that condition? An artist, Mr. Hallward is reported as having said, is condemned if he does not adopt the mode of his time, and ventures to use a language which can give expression to his own feelings. It may be here interjected that if the language is not understanded of the people, the message must perforce fail of its effect—unless, indeed, the new language seems to be worth the trouble of learning, which is very seldom the case. It may well be that that is, after all, the highest form of art which makes the widest and the most instant appeal, provided that the response includes not only the "profane and vulgar crowd," but also the very elect who are not precious and eccentric; for, as Mr. Hallward truly says, "in art is to be found an interpretation of our own lives, and in this way it brings happiness and satisfaction." That is a faithful saying, and seems to us to admit of direct application to the manifestation of art in architecture.

Architectural Oddities.

When the lay Press condescends to notice architecture, it nearly always does it wrongly. For example, a London daily newspaper came out one day last week with about a quarter of a page illustrating "A Squire's Architectural Oddities." The Squire was one Fuller, who half a century ago amused himself by putting up a number of freak buildings in the village of Brightling, which is about nine miles inland from Hastings. Among them are an observatory, which is the most respectable of the collection, and contains in its dome a camera obscura, which, it is alleged, the Squire placed there in order that his tenants might keep observation on their cattle without being put to the trouble of going into the fields; a pyramid in imitation of "Cleopatra's Needle," but built of local sandstone, and reaching 600ft. above sea-level; a "Solomon's Temple," a mosque-like circular structure, with massive marble pillars; and a "Sugar-loaf House," in which the Squire wished to keep a man for seven years, to see what he would look like after being isolated from the world for that period without shaving, washing, or communicating with any human being. Although several "subjects" offered themselves, the authorities would not allow the Squire to carry out the experiment. It is no doubt all very interesting in a crude sort of way; but one would hardly have thought it worth a quarter of a page of a great London daily newspaper. Far be it from us to quench the smoking flax; but we trust that "architectural oddities" do not represent the only sort of architecture in which the public are supposed to take an interest. We have a horrible suspicion, however, that they prefer what is *bizarre* to that which is beautiful.

Architecture and the American Attitude.

Mr. Percy Robinson, F.R.I.B.A., President of the Leeds and Yorkshire Architectural Society, reminded his hearers, in the course of his presidential address this year, that, speaking on the subject of Town Planning last year, he suggested that the local advisory committees proposed to be formed in connection with town planning schemes, might be useful not only in connection with the immediate object in view; the scope of their work he thought might well be extended to watching over the artistic amenities and the evolution of our towns and cities in other directions This idea, he pointed out, has taken a concrete form in New York, where, at the instance of the ex-President, Mr. Roosevelt, following a suggestion made by the American Institute of Architects of Washington, a Council of Fine Arts has been created, and directions have been issued that for the future "before any plans are formulated for public buildings or grounds, or for the location or erection of any statue," the heads of executive departments, bureaux, and commissions must submit the matter to the Fine Arts Council, and follow their advice, "unless for good and sufficient reasons the President directs otherwise." In such an action as this, we have, he thinks, evidence not only of the enterprise of our brethren across the seas, but of their growing appreciation of architectural art, and it is an example that we might copy with advantage. We are afraid, however, that Mr. Taft has been much less sympathetic in his attitude towards æsthetic aspirations

Art and Sentiment.

The great wax bust farce has had one good effect. Its enactment (it is "still running") has drawn from Mr. T. G. Jackson, R.A., an excellent letter to the "Times," and the letter has provoked a leading article in the leading journal. Mr. Jackson points out that the authorship of the bust has nothing to do with its artistic merit. "Being what it is, it would be no better if it were proved to be by Leonardo, and no worse if it were by Lucas." This is cold-drawn commonsense; but, as Mr. Jackson rather grudgingly acknowledges, it discounts the sentimental interest that would pertain to Leonardo, but not to Lucas. In this respect it would, if Leonardo had wrought it, possess, undoubtedly, a certain measure of value, even if it were badly done. It cannot be denied that such sentiment is legitimate and wholesome. Mr. Jackson thinks "it is amusing to see how the merit of the works is forgotten in the dispute about its origin." We submit, however, that the merit of the work does not affect the question, except in so far as it helps to prove or to disprove the authorship, which is the real point at issue. Both Mr. Jackson and the "Times" leader-writer, in their eager championship of pure art, seem rather inclined to ridicule and condemn the form of hero-worship implied in coveting or cherishing the inferior works of great men. "The name of Lucas," says the "Times" writer, "is worth (among dealers) little or nothing, whatever price may have been given for a work of his attributed to an artist with a much more valuable name. This fact proves, what needed no proving, that there are many wealthy connoisseurs who buy works of art not for their intrinsic merit, but for what is supposed to be their authenticity." That is unimpeachably correct, and is perhaps deplorable; but we part company with the writer when he proceeds in this strain: "This state of things reveals an extraordinary timidity in buyers of works of art. If they all trusted their own taste, names would have no value." This would be true enough if one could eliminate from the field the glow of sentiment and the glamour of personality. Such detachment seems to us to be quite impossible. Uproot sentiment, and the love of art comes with it. Not the sentiment, but the excess or exaggeration of it, is to be strongly deprecated, and the unholy trafficking in it is hardly more detestable than the mawkishness which becomes its easy prey. It is necessary to discriminate between the states of mind represented respectively by such loose formularies as "It must be good, So-and-so did it," and by "So-and-so did it. It is bad, for all that; but since he was one of the world's great artists, anything that came from his hands is interesting, whether or not it have intrinsic merit. It is valuable upon personal rather than upon artistic grounds; although, even artistically, it may be valuable as throwing light on the development or the waywardness of genius." Yet, while moderating somewhat on the severity of Mr. Jackson and the "Times," we are at one with them in the condemnation of false values. Sentiment, and the pious afflatus, are very well if they are kept within due bounds—and if accompanied by a due regard for art. When they supersede that regard, and seem to render art a thing of little relative importance, they become as abominable as any perversion and unhallowed exploitation of a natural instinct always must be; and to this extent Mr. Jackson is justified of his timely protest.

The Ambitious Craftsman.

The other evening, the Duke of Argyll, in presenting prizes awarded to the students of the Trades Training School, which is conducted by the guilds of the Carpenters, Joiners, Painter Stainer, Plasterers, Tylers and Bricklayers, and Wheelwrights of the City of London, justly commended the good work that is being done in technical education by these City Guilds. It is indeed excellent—so far as it goes; and Mr. H. Phillips Fletcher, the Director of the Schools, is no doubt justifiably proud of the fact that the schools, which were instituted seventeen years ago, as something in the nature of an experiment, have proved by their continued prosperity the value of the work which is being done. He was also only too correct in the contention that it is impossible nowadays for an apprentice or a young workman to learn thoroughly his trade unless, by means of some such institution as this, he is infused with the vitalising spirit of his craft, instead of being left to welter in some cramping furrow, hole, or corner of it. It is a hard case, and any effort to meet it is commendable. The City and Guilds of London have set an excellent example of practical patriotism—for their energy extends far beyond the bounds to which their title would seem to restrict them, and spreads not only over the entire kingdom, but even beyond it. They are doing perhaps all that they can, and are doing it passing well. To say, however, that it is not enough is to understate the case almost ludicrously. Technical education is a crying national need, and should be placed on a national basis, and should be made compulsory. The youths who volunteer to submit themselves to courses of instruction do so less with a view to personal improvement as a thing to be desired for its own sake, than with the object—against which there is but little to be said—of qualifying for better positions. Generally speaking, their enthusiasm is less for the joy of perfect craftsmanship than for the material rewards of proficiency. Mr. R. Blair, Chief Education Officer of the London County Council, says in a report recently presented, "The scholarship system will have failed in its intention if a good proportion of the scholars do not find their way into industry and commerce," and he points out that this failure is in danger of being realised. Social ambition, and not the honourable desire to become "a workman that needeth not to be ashamed," is the spur of the great majority of the youths who are now being helped in various ways to "better themselves," and it is time to take some effectual means of placing technical education in a truer light. A system which trains a few teachers and develops a few foremen, is doubtless useful in a way; but it scarcely touches the fringe of a most important problem.

Messrs. Horne and Co. (W. E. Horne, F.S.I., W. V. Jell, P.A.S.I., F.A.I., J. R. Lancaster, F.S.I.), announce that in consequence of the demolition of their offices at No. 8, Delahay Street, under the Public Offices Sites (Extension) Act, 1908, they have removed to 35, Old Queen Street, Westminster, S.W.

SOME MINOR ITALIAN ARCHITECTURE.*

Whether we have seen them or not, we all know something of the big things of Italy, and of the works of her great masters in architecture. Possibly in our less heroic moments the big things are apt to seem hackneyed and the big names to pall, so that it is a relief occasionally to turn our backs upon all the grandeur and to dwell for a while on lesser themes.

Varallo, Orta, and Varese.

I propose, then, to bring before you this evening a series of small and hitherto almost unnoticed buildings, the work of obscure or unknown architects, and will ask you to accompany me to a part of Italy which is not famous for any achievement in great architecture, but where the stones cry to us in the vernacular of a district that lie somewhat apart from the main trend of contemporary thought. Varallo indeed speaks but the rude patois of a sequestered valley. By the lake of Orta we may listen to a strain of true lyric grace, while Varese tells its story in unmistakable prose, a little turgid and artificial as befitted the times, but not without interest.

If you draw a line across the map of Italy westwards from the town of Como, twenty miles will bring it to Varese, situate among the low foothills just where the mountains fade away into the great Lombardy plain. Go miles further on, after crossing the lower arm of Lago Maggiore it will pass through the town and lake of Orta, and at a point some 60 miles from its starting-place Varallo is reached, in the deep and wooded valley of the Sesia, a river which rises among the glaciers on the western flanks of Monte Rosa. The connecting-link between these three places is that each possesses a noted sanctuary in its Sacro Monte, or Holy Hill, and it is more particularly of these sanctuaries and the buildings which they comprise of which I propose to speak.

Imagine a glassy and undulating slope on a wooded hill, dotted with chapel-like buildings that gleam among the tree trunks, or stand out white against the sky, imparting a character of architectural romance to the whole mountain-side. Provide them with porticoes under which are grated view openings to the interior, vary the plan, size and design as fancy directs, and you have the general appearance of a Sacro Monte.

The Holy Hills.

Let us begin with the Sacro Monte of Varallo, that being, so far as I am aware, the first thing of the kind to be attempted. Its inception was due to a Franciscan friar, Bernardino Caimi, of noble Milanese family, who had been appointed Commissary of the Holy Places in Palestine by Sixtus IV. He returned home in the year 1481, and partly in grief at the neglected condition in which he found the sacred sites, partly with the wish to edify those of his countrymen who had not the opportunity of travel, determined to found a New Jerusalem in his native Lombardy, to contain, as its central object of pilgrimage, a replica of the Holy Sepulchre. Careful search among possible sites indicated the hill that overhangs Varallo as the most convenient for his purpose; and the foundation-stone of the Holy Sepulchre Chapel was laid in the year 1491.

Caimi started with the idea of reproducing the Holy Sepulchre, and probably certain other holy places, as Golgotha and the Grotto of the Nativity. But as the work proceeded the idea developed into commemorating the events of the Sacred Narrative by groups of life-sized figures, so that there are now forty-four chapels upon the Sacro Monte. We call these little buildings chapels for want of a better word, but they are not built or fitted for religious functions of any kind, but solely to shelter these groups of painted imagery which form in conjunction with their frescoed backgrounds tableaux of the Redemption story

Leonardo the Innovator.

Samuel Butler (whose "Alps and Sanctuaries of Piedmont" is one of the most delightful books of Italian travel) conjectures that the original idea of these representations in which painting and sculpture are combined with the realism of a scene on the stage, may have been suggested to Caimi by the great innovator Leonardo himself, who was in Milan at the time the scheme was projected. But in truth the whole idea was essentially mediæval, akin on one side to the miracle play, and on the other to the groups of coloured figures familiar to us in the altar-pieces of Northern Europe. In the earliest examples the figures are of wood, the latest are of stucco, but those of the best period are of terra-cotta. All are painted—nearly all, alas, repainted!—by the nearest house-painter or professor, which comes to pretty much the same thing, with rouged cheeks and staring eyes.

Crude Realism.

For canopies, hangings, and so forth, real drapery is introduced, and the figures have wigs of hair or dyed flax. There is no shirking realism so far as it may be had.

The first sight of these groups is certainly something of a shock. There is a sense of theatrical convention, of self-defeating realism; of the lifelessness that comes from arrested movement, as of a stage full of paralysed marionettes. This is the first impression. But if we complain of staginess, we must bear in mind that this is an attempt to put a scene upon a stage. It is a perpetual miracle play, a mediæval mystery without words or action. This intention must be recognised, and its resultant conventions accepted before we can judge fairly of the way in which it has been realised. It is both easy and obvious to talk of waxworks and Madame Tussaud. All coloured sculpture, even that of the Greeks, is obnoxious to this form of criticism. But what is really at fault in the majority of the groups is the coarse and tasteless repainting which they have undergone. Nor have time and weather been much kinder than the house-painter, and the scaling, blotching, and blistering of the paint, especially of the flesh tints, and the secular incrustations of dust and dirt, have given some of the figures "a diseased and mangy look," as Butler says, "so that there is not a chapel which does not require some effort of the imagination before the mind's eye can see it as it was left by those who made it." But, after all, the strongest motive for suspending judgment and looking a little below the surface is the respect due to the great artists who took part in these works, viz., the three brothers D'Enrico, of Alagna, the great Fleming Tabacchetti, and Gaudenzio Ferrari himself; the last of whom "ranks as among the few purest and most accomplished artists of the very culminating periods of Italian art; so that what he thought good enough to do may be well worth our while to consider with the best attention we can give to it." Such at least is the opinion of the eminently sane critic I have just quoted. However, it is not my intention to discuss the sculptures, and I have only said so much because it was impossible to speak of the chapels without alluding to that for which they exist. At Varese and

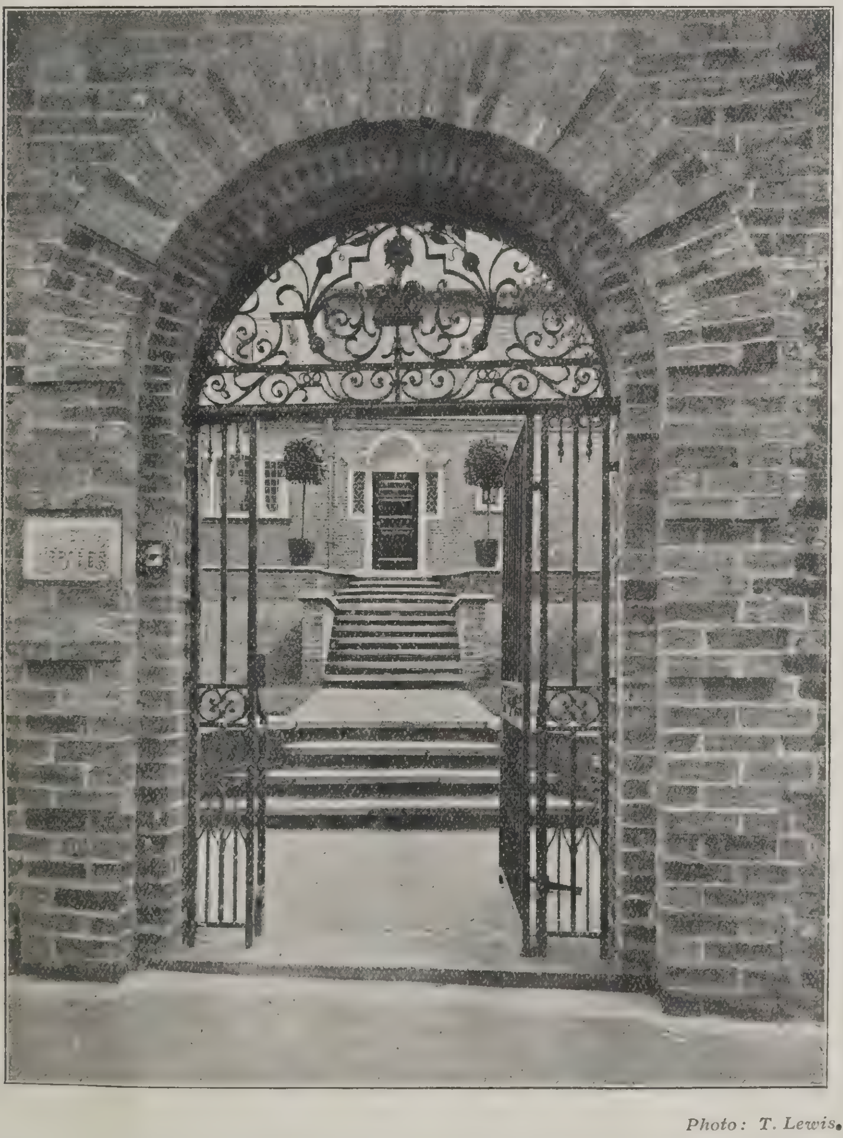

Photo: T. Lewis.

MEDICAL SUPERINTENDENT'S HOUSE, THE RETREAT, YORK: ENTRANCE GATE.
WALTER H. BRIERLEY, ARCHITECT.

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*Abstract of a paper read by Mr. F. C. Eden, on December 10, before the Architectural Association.

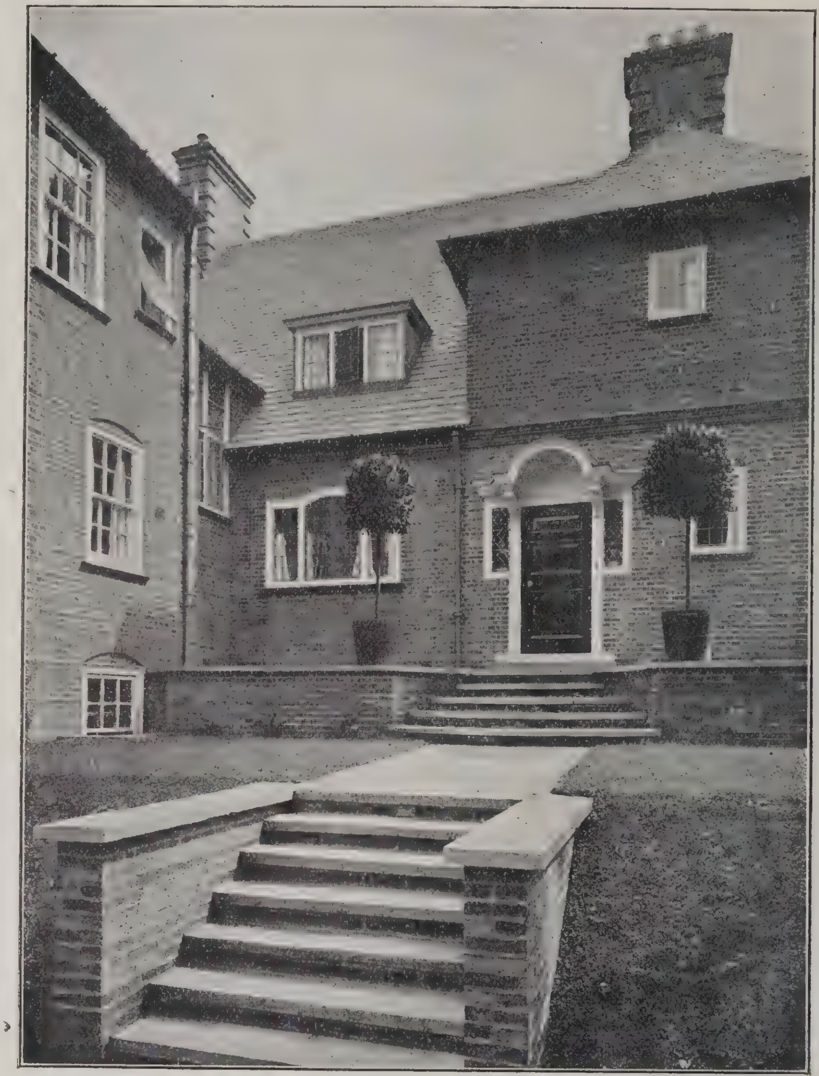


Photo: T. Lewis.

MEDICAL SUPERINTENDENT'S HOUSE, THE RETREAT, YORK: ENTRANCE.
WALTER H. BRIERLEY, ARCHITECT.

Orta we may leave the contents of the buildings out of count altogether, but at Varallo there are both frescoes and sculptures which undoubtedly take a high place among the works even of that great period, the Cinquecento.

The Sacro Monte rises precipitously to a height of about 500ft. above the little ones, and is approached by a paved and well-graded path overshadowed by the chestnuts with which the flank of the hill is covered. When the top is reached the first impression is a bewildering one, as of an inconsequent and haphazard jumble of chapels. But even when many hands and many minds have laboured on a piece of work, and at long intervals of time, that is not the Italian way. As a matter of fact, buildings went on at irregular intervals during a period of two centuries and more. Over forty chapels had to be huddled on to a small, irregular, and *accidenté* piece of ground; they had to be approached in a certain order, and no architect of repute, except the rather second-rate Alessi and Tibaldi, were employed. Yet the result is what we see.

The Italian Garden.

When the sanctuary was first projected, it was doubtless impossible to foresee to what an extent the scheme would develop. So it came about that as new chapels were founded from time to time they were built on convenient spots, with due regard to æsthetic requirements, but without much consideration for the chronological sequence of the events commemorated. Towards the close of the sixteenth century, Tibaldi was commissioned to prepare a plan to remedy this confusion, and though little or nothing in the way of building can be attributed to him, the arrangement of the connecting path by which the chapels are linked in their proper order seems to have been his. The sinuosities of this path are far more judicious than the serpentine meanders of the Jardin Anglais, and there is much of the characteristic charm of the Italian garden in the lay-out, in which we include the length of time required to find out how small the area of ground covered really is. The path, of course, is cobble-paved with cross ribs of granite to afford foothold where the gradient is steep. It is bordered with trim hedges of box and beech; chipped shrubs and stone seats are set in the right places, and the chapels themselves supply points of interest at every turn of the way.

The walls are plastered, the columns and dressings of grey granite, a combination equally charming and appropriate whether among the bleak Breton moorlands or on the wooded slopes of these riant Alpine valleys. Much, of course, will depend upon the texture of the plaster, and we may trust the Italian even now to get an interesting surface in that material.

Beautiful Roofs.

The fine stone slabs with which the roofs are covered would suffice to confer a sort of dignity upon the meanest shed. Owing to the absence of coursing they have a curious appearance of having been thrown helter-skelter on to the roof, and though doubtless they lie closer than they seem to do, and there must be no little method in the madness of their laying, it is not easy to see how they manage to exclude the searching snows of winter.

In beauty of colour and texture these roofs excel, if that were possible, the stone roofs of the Cotswolds, and to one looking down from the Sacro Monte upon the huddled houses of Varallo, the little town seems clothed in mouse-coloured velvet, with an occasional patch of tiling to give the effect of rose-coloured rivers.

Two Systems of Planning.

In the erection of the chapels two systems of planning have been followed. The earlier were built upon a simple quadrilateral plan, divided by a screen into two compartments, the inner for the sculpture, and the outer for the accommodation of the pilgrims. In the later examples the entire space is given to the representation, and an external portico is attached to shelter the spectators, with grilled openings to the interior.

Interesting Screens.

The screen is often the most interesting part of the building. The upper part is usually glazed with nice old glass of pleasant tint and texture. Below is an oblong grille of carved wood, the upper part sometimes canted to afford a comfortable view of the wall and ceiling paintings. These wooden lattices are a peculiar feature of Varallo, as the iron grilles are of Orta.

The highest point is a rounded knoll, the summit of which is occupied by the chapel of the Transfiguration. This is a huge plain drum 40ft. in diameter and of considerable height; in itself bald and unsatisfying. But note firstly the charming contrast afforded by the porch with its delicate coupled columns and interesting entablature; and secondly, it should be borne in mind that these chapels are not so much isolated objects as parts of a composition. The architects of the seventeenth century at their worst were usually good scene-painters, who thoroughly grasped the art of grouping and of producing striking effects. It was probably their feeling for scenic propriety which led them to adopt the circular or polygonal plan whenever they had to build a chapel on an eminence. Orta and Varese supply numerous examples of this preference.

Grouped Chapels.

The concluding chapels of the series are grouped together near the edge of the precipice overlooking the town, so as to form a sort of piazza. One side is occupied by the large church of the Assumption, the other three by a picturesque medley of chapels, cloisters, and loggias. The church has an intolerable modern facade, gaudy and pompous; in most unpleasing contrast to the quiet beauty of the rest.

Three large chapels, containing respectively the Nailing to the Cross, the Crucifixion, and the Deposition, form an important group in the south-east corner. They are raised partly on a lofty substructure, partly on the native rock. A loggia extends along the front, approached by a flight of steps at either end. The first and last contain notable works by G. d'Enrico. In the Crucifixion chapel both sculpture and paintings are by Ferrari. "No finer works of their kind have been preserved to us," says Butler. Be this as it may, no one who knows Saronno, or has even glanced into the Church of S. Maria delle Grazie at the foot of the hill, will doubt that he is in the presence of a really magistral work—devout, manly, and dignified. As you turn from this you are faced by the light colonnades of the Scala Sancta, an immitation for pilgrimage purposes of the Roman original, by which we may ascend to the upper cloister to enjoy another view over the piazza, and a wonderful outlook through the clairvoyées at the back up the valley of Lesia, with Monte Rosa's snowy summit closing the distance.

Taken as a whole, the chapels of Varallo must be pronounced inferior in delicacy and refinement to the best of those at Orta, and in grandeur and scenic picturesqueness to those at Varese; but in simplicity, variety, and skilful grouping they are hard to beat. Moreover, and this is perhaps their greatest

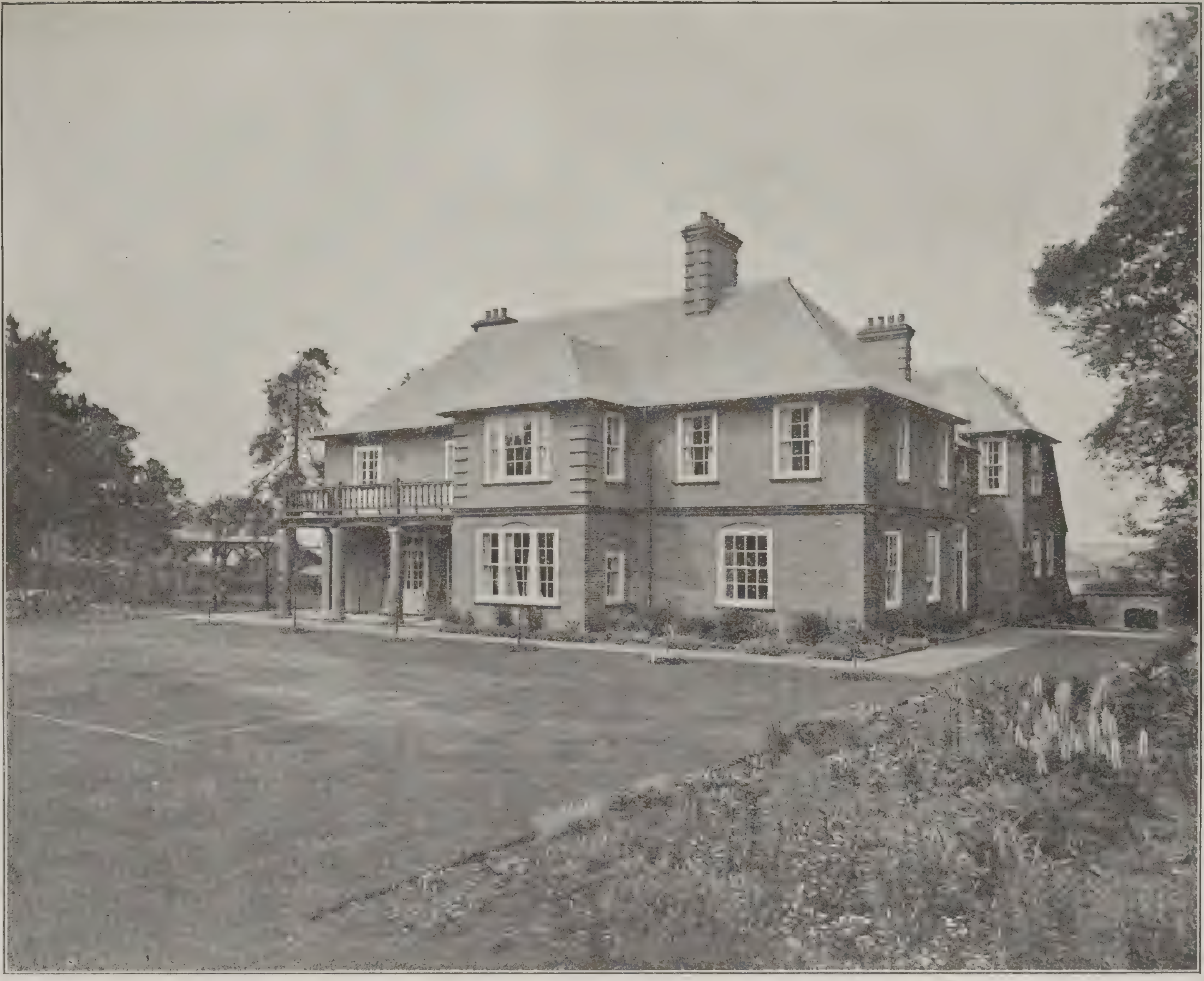


Photo: T. Lewis.

MEDICAL SUPERINTENDENT'S HOUSE, THE RETREAT, YORK. WALTER H. BRIERLEY, ARCHITECT.

This house is built of 2-inch hand-made bricks, with cavity walls, and the roofs are covered with half-inch rough Westmorland slates. The exterior woodwork generally is of redwood, painted, with the exception of the veranda balcony, which is of English oak.

merit, they are entirely suited to their situation and use. The gentlemanly elegance of Orta and the pomposity of Varese would alike have been out of place amid these sunny Alpine pastures, where such beauty alone need be sought as comes from that harmonious blending with nature which ever rewards the unaffected use of those materials which come readiest to hand.

The Sacro Monte of Varallo was, as I said, the first and for about 100 years the only thing of its kind. But in 1583 we have the first notice of a sanctuary being in contemplation at Orta. Here again the inspiration came from the Franciscan Order, and was probably suggested by a visit of S. Charles Borromeo to Orta on his return from Varallo.

The single narrow street of which the little town of Orta consists runs along the shore of its lake, at the foot of a steep promontory which projects nearly half-way across the water. Its summit is occupied by the sanctuary. Here are a monastery and twenty chapels, standing in a sort of wood, intersected by grassy glades and commanding exquisite and everchanging views of lake and mountain.

The entrance arch is approached by a cobbled path bordered by cropped limes. It is surmounted by a figure of St. Francis, in whose honour and to depict the scenes of whose life the chapels were erected.

Granite, Plaster, and Marble.

The materials employed here are the same as at Varallo, namely, granite and plaster, but with the addition of a dark serpentine marble, which takes the finest detail, and is used with excellent effect for the smaller moulded members, as caps, bases, and architraves.

The lay-out differs from that of Varallo, inasmuch as the chapels have been placed so as to get the best effect from each separate building, rather than with an eye to picturesqueness of grouping.

All the best chapels were erected between the years 1591 and 1630. Dr. Goldhardt—to whose pamphlet I am much indebted—discusses the authorship of these words, and attributes them on evidence which seems fairly conclusive to a Franciscan, Padre Cleto, of Novara. He draws attention to the significant fact that the style is old-fashioned, in fact, about a century behind the times; and suggests the inference that the designer was an amateur of Classic architecture, uninfluenced in the seclusion of the cloister by current movements and fashions, and this by no means to the detriment of his art.

Figure Groups.

In contrast with the sculptures at Varallo, the figure groups here are of no account; "feeble silly cant," Butler calls them; nor is the arrangement of the darkish interiors so well adapted for their display. But all the more worthy of attention is the outside treatment. Delicacy, economy of means—in many cases the cornices and other members are reduced to their most rudimentary forms—elegance of proportion, these are perhaps the most outstanding notes.

We now come to two more important chapels. They are both simple oblongs surrounded by colonnaded loggias, and it is interesting to observe how from very similar plans two utterly different buildings grow.

The first, known as the Madonna of the Angels, from the trumpeting angels on the roof, is the most ornate of all. The facade is charmingly composed, and for its date (1606) most refined in detail.

Concealed Art.

The fifteenth chapel, which has been so oddly connected with the name of Michelangelo, is one of those simple, inevitable, and masterly designs wherein consummate art lurks artfully concealed. The attribution of the authorship to the great Florentine master is, of course, worthless, except as evidence of traditional admiration. It is difficult to imagine anything more remote from the austere grandiosity of Michelangelo's manner than the Mozartian urbanity and grace of this little building.

We are now on the highest point of the Sacro Monte, and are, therefore, prepared to find, as at Varallo, a circular chapel. The plan is of the utmost simplicity—a plain drum surrounded by a peristyle of twelve slender Doric columns bearing semicircular arches. The stylobate is broken at the cardinal points by flights of steps for access to the ambulatory which is roofed with a lean-to. This plan is the earliest example (1597) of a central block surrounded by a portico, and exercised considerable influence upon the later chapels both here and at Varese. Henceforth all the more important ones display this feature.

The eighth chapel is obviously a variant upon the same theme, the octagon being taken as a basis instead of the circle. It is clear from the plan that the ambulatory involved the designer in sundry difficulties. The arches, if only eight in number, would become sprawling and ill-proportioned unless they could be carried to an extravagant height. The difficulty has been overcome by a similar device to that so often employed in the aisle of a Gothic apse, viz., by the division into alternate square and triangular spaces, producing thereby a sixteen-sided ambulatory.

Mastery of Resource.

In a small late building like this, by no means one of the best of its kind, one is surprised at the feeling for effect, the unerring knowledge and command of every device whereby the desired effect is produced, the freedom in handling difficulties. The squares I spoke of just now in the plan of the ambulatory are not squares, the sides incline inwards towards one another, that was dictated by the proportions of the arches (and an Italian mason is not one to bungle over the irregular vault thereby produced); nor are the faces from which the cross arches spring parallel; that gets over another difficulty; true, it lands you in a winding arch, but as that is only in plastered rubble nobody's bones are broken. By-and-bye we shall see another way in which the difficulties of an octagon surrounded by an arcaded loggia were faced at Varese.

I have dwelt thus at length on the plan of this chapel because, in spite of certain signs of debasement, it is a fair example of the skill with which these obscure masons handled their "Renaissance box of bricks."

Baroque Influence.

The next chapel is elliptical in plan—sure evidence of Baroque influence, and the porch seems stuck on.

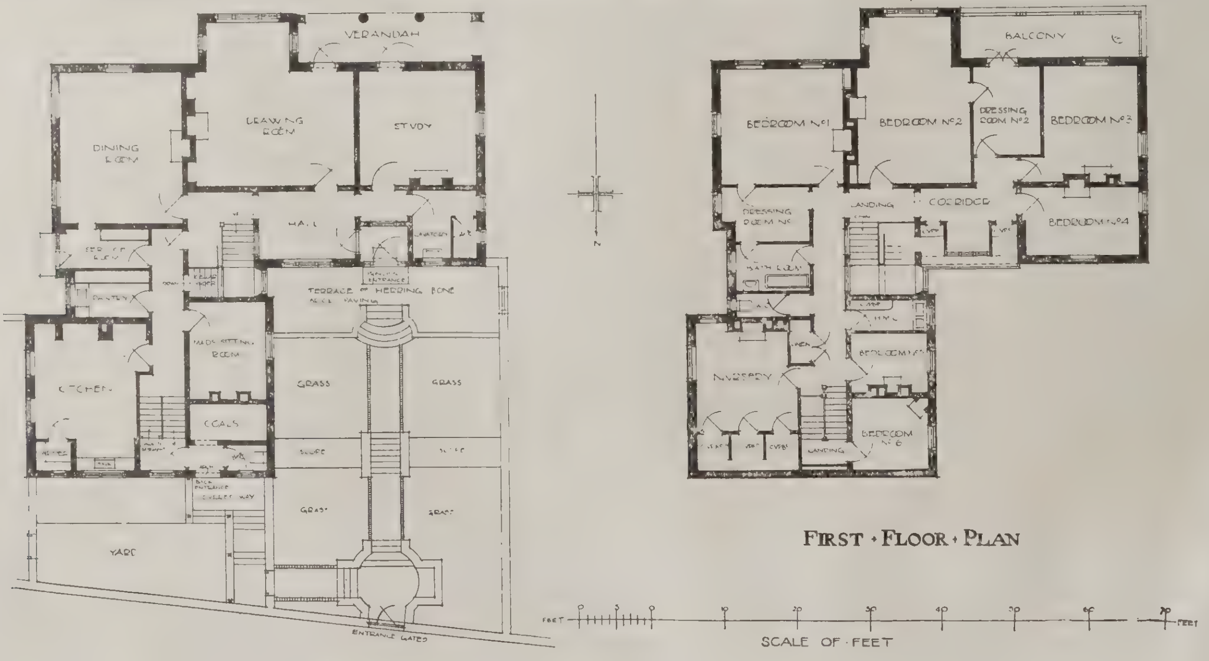
Inside there is a good iron screen. There must have been a school of excellent smiths in this district. Almost every house in the town has a good iron balcony, and the neighbouring villages and churches are rich in ironwork, as well as the Sacro Monte itself. Even when the design is a little riotous the workmanship is careful, and even precise.

The doorway from No. 10 is of the same date as the entrance arch, and is not a bad example of the use of the black serpentine. It was interesting to find that the capitals are copied from an antique in the old church of St. Giulio on the island. This chapel also has a fine grille, of which it was possible to photograph the central portion.

One of the most charming structures here is the little well-house. The pedestals and caps are pentagonal, which is, I suppose, the only way of getting comfortably round an octagon.

Varese.

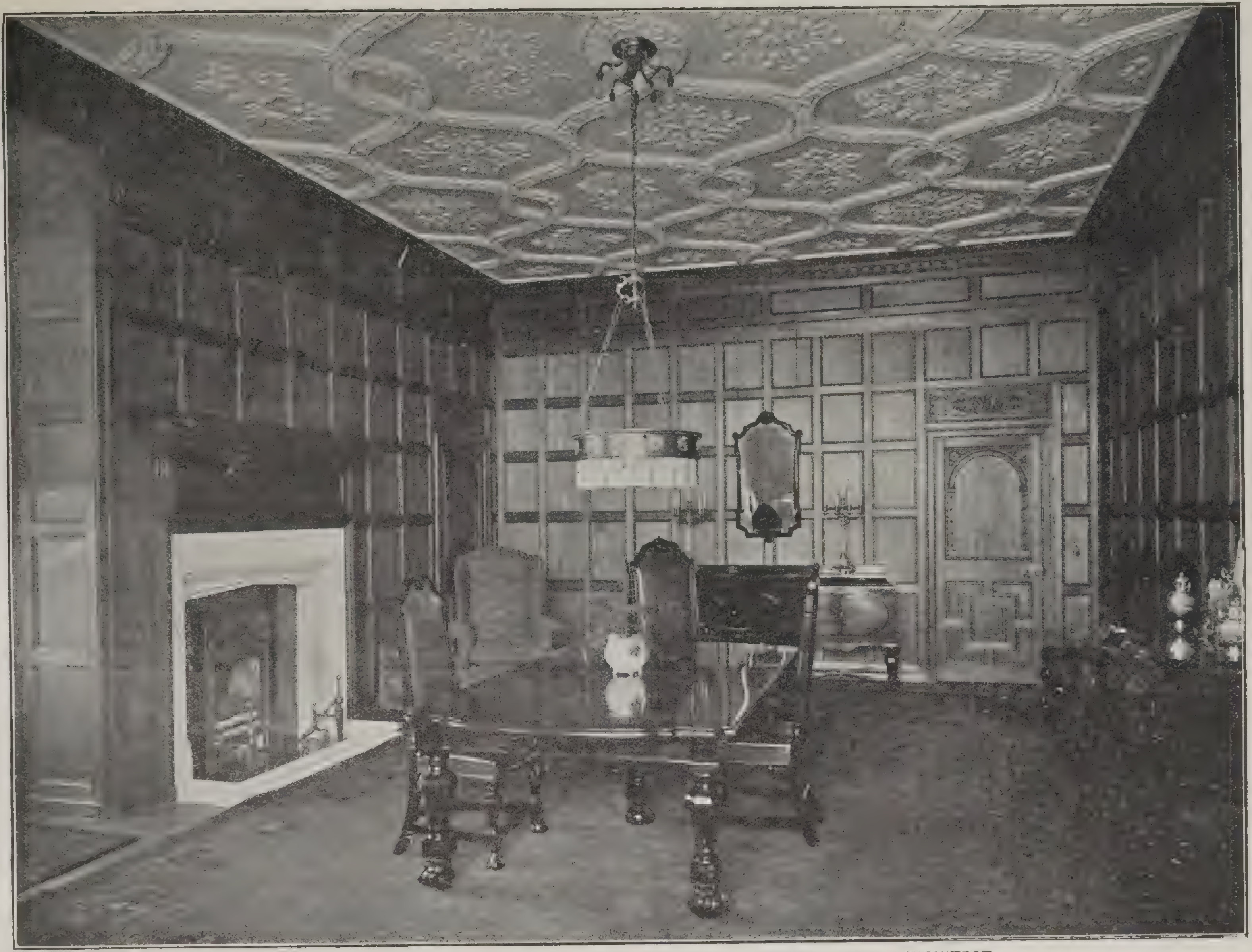
The town of Varese is situated on the verge of the plain of Lombardy. About three



GROUND · FLOOR · PLAN

FIRST · FLOOR · PLAN

MEDICAL SUPERINTENDENT'S HOUSE, THE RETREAT, YORK. WALTER H. BRIERLEY, ARCHITECT.



RAVENSCOURT, THORNTON HALL: THE DINING ROOM. ROBERT WHYTE, ARCHITECT.

The dining-room is panelled in kauri pine from floor to ceiling. The grate and electric fittings are armour-bright, with ornaments of brass. The furniture is of mahogany, and was specially designed for this room. The fireplace is of Painswick stone.

miles to the north, in the direction of the mountains, is the entrance of the Sacro Monte.

The general scheme is quite different from what we have seen before; the chapels are not grouped in a confined space, but follow a broad paved road which ascends in zig-zags along a rising ridge. A chapel is placed at each turn of the road, and intermediately wherever a long straight run occurs. The road is perhaps 2½ miles long, and is the main approach to the ancient hill town of St. Maria del Mönte, which occupies the summit. The construction of the road was contemporary with that of the chapels, and no little skill and feeling is shown in its disposition and planning. Not only had it to follow the line of least resistance, so far as climbing the hill is concerned; but it is so schemed that the chapels show to the best advantage from below, and also provide the best points of view for the enjoyment of the landscape.

Bernascone of Varese.

Again a Franciscan was the originator of the scheme, the execution of which was entrusted to the architect Bernascone, of Varese. There are fifteen chapels, in illustration of the mysteries of the Rosary, each group of five being separated from the next by an arch and fountain. With the exception of five late and unimportant buildings all are Bernascone's work, and show him to have been a man of considerable imaginative and inventive power. Though begun only ten years later than Orta, it is quite 100 years later in manner. If the chapels there were the work of a refined and gifted amateur, here they suggest the professional man, quite up to date and to all the tricks of the trade. A marked difference is observable at once in the colour of the buildings; we have exchanged the stone roofs and whitewash of the mountain valleys for the tiles and yellowish stucco of the plains. Granite is more sparingly used, and the increased use of stucco instead of stone for ornamental features gives a sort of coarseness that smacks of a declining art.

The plan of the first chapel is similar to two of those at Orta, viz., a colonnaded portico round three sides of an oblong cell. But here the elevations suggest a Classic temple. We now find for the first time view openings in the sides of the building as well as in front. In this case they are rather prettily treated.

The second chapel is insignificant, and at the first turn we come to No. 3. Here importance is given to the side openings, which become regular transepts. Their treatment is, however, much more successful in the next chapel, which is designed like a domed church on the plan of a Greek cross, the transepts and aisles being as it were turned inside out.

The external division of the copper-covered dome into eight unequal segments is noteworthy; the wide divisions corresponding to the transepts, and the narrow to the interspaces. The undue width of the broader divisions is cunningly counteracted by the keel-like form given to them.

Masculine Work.

Immediately opposite this last is the most important building of the series. It is also the most complicated both in plan and design, but is a fine masculine piece of work, which, as I found on my second visit to Varese, improves greatly upon further acquaintance. The transeptal form of plan is again adopted, in this case grafted upon an octagon. The transepts instead of being connected by arcades, are joined merely by balustrades, which play a curiously important part in the elevation, as you will see. At first sight it is impossible to believe that they are horizontal. Their raking lines seem to buttress the main portico with a studded effect of support, and cause the whole building to sit securely on the side of the slope. The illustion in increased by the want of parallelism between them and the main block, so that in perspective their lines vanish to different points. You will observe what excellent effect is obtained by tiling the cornices; how by this simple means a very strong line may be produced without unduly coarsening the mouldings.

At the next turn of the road the town on the mountain-top comes into view with something of a shock. The chapel of the Flagellation at this spot has certain good points; a life-size Pieta, most effectively placed over the portico, and some pretty plaster work in the vault.

The road now ascends rapidly along the side of a deep valley to the Crucifixion chapel, with an interesting porch surmounted by a delicate pierced iron cross, designed to silhouette itself against the whiteness of the wall behind.

The ironwork here is not quite up to the Orta level. It is often enriched with bronze ornaments which have acquired an exquisite patina.

The plan of the Ascension chapel is interesting; an elongated octagon within and an ellipse without, to which is attached a large portico, a sumptuous piece of Baroque design.

The last chapel of Bernascone's is very simply planned.

Perils of Simplicity.

"Ah, me! what perils do environ the man that meddles with" simplicity. It looks so inevitable, and is so full of pitfalls. The vaults of the ambulatory are barrels decreasing both in width and height inwards, sections of a cone, in fact; and the arches which separate them follow the lines of the pilasters from which they spring, so that an angle runs along the soffit, salient for half its circuit, and re-entering for the other half, and just disappearing at the apex.

Discussion.

Mr. Theodore Fyfe proposed a vote of thanks to Mr. Eden, and observed that the examples of architecture which had illustrated the paper were distinctive in character, and possessed a fine early Renaissance feeling. Referring to a building which Mr. Eden had said was generally attributed to Michel Angelo, a theory in which he (Mr. Eden) placed no great faith, the speaker was more inclined to credit the authorship to Bramante. The value of paint was fully realised by the Italians, and applied to their sculpture with characteristic method. Mr. Percy E. Newton seconded the vote of thanks, and said that he had the pleasure of accompanying Mr. Eden on his first visit to Orta. It was a delightful spot; the lake was very quiet, and the locality formed an ideal place for a holiday.

Mr. H. H. Statham supported the vote, and remarked upon the interesting variety of treatment manifested in the plans. It would appear that the architects had formed their plans with but small consideration for the treatment of the superstructure. Mr. Eden's paper was one of the most interesting architectural lectures that he had heard for a long time.

Mr. Arthur Keen, speaking in support of the vote, said that what had struck him most was the wonderful beauty of the detail, which, perhaps, had been left more to the craftsman than to the architect, with, he thought, eminently satisfactory results. He referred more particularly to the detail of the iron grilles.

Mr. Gerald Horsley also supported the vote of thanks, and enquired of Mr. Eden whether Ferrari had designed any buildings. He knew that he had executed several groups in terra cotta, and had, he believed, also painted the background on the walls of a chapel, in fresco.

The Chairman (Mr. C. Wontner Smith) said that he had been to Italy once or twice, but never in the direction of Orta.

Mr. Eden responded, and thanked them for the very kind reception of his paper. Ferrari, so far as he knew, had never acted as an architect. His best group was certainly the one in the Crucifixion Chapel.

DRAIN OR SEWER?

From a Legal Contributor.

Questions often arise as to whether a particular pipe carrying sewerage is a drain or sewer. The importance of the matter lies in the fact that, broadly speaking, the local authority is liable to repair and maintain the sewers.

Inasmuch as it is practically impossible to deal with individual cases without a survey of the whole question, it is proposed in the present article to discuss material sections of the Acts of Parliament dealing with the matter, and the more recent cases which have been decided with reference thereto.

The definition of the words "drain" and "sewer" is statutory. Under the Public Health Act, 1875, section 4.—

"Drain" means any drain of and used for the drainage of one building only, or premises within the same curtilage, and made merely for the purpose of communicating therefrom with a cesspool or other like receptacle for drainage, or with a sewer into which the drainage of two or more buildings or premises occupied by two different persons is conveyed.

"Sewer" includes sewers and drains of every description except drains to which the word drain interpreted as aforesaid applies, and except drains vested in or under the control of any authority having the management of roads and not being a local authority under this Act.

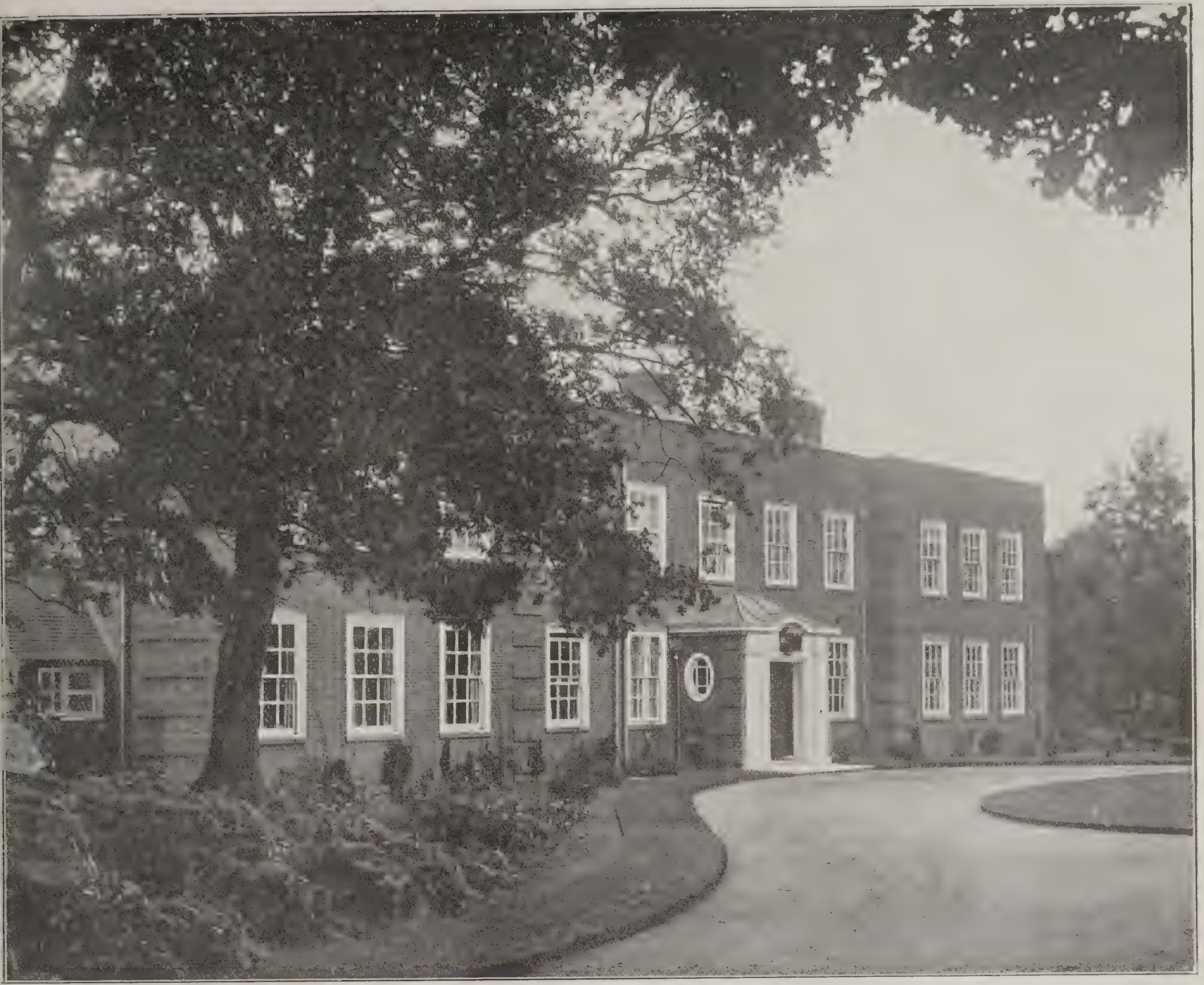
It is necessary to understand that there is a fundamental distinction between a drain and a sewer. A drain is made by a private person for private purposes: it is usually made in private land, and is not intended to be used by other persons. Where, however, it comes to be used by someone else the tendency is for it to become a sewer. Upon the question as to when it does so become a sewer extraordinary judicial difficulties have arisen.

Take first the case of *Travis v. Uttley*, 1894, 58 J.P. 85. In that case a drain ran under three houses. It passed through the basements and received the drainage first of one and then of two other houses. Mr. Justice Wills, in the course of his judgment, said: — "It is impossible to say that the part which is used for the drainage of one building is a drain, and the rest a sewer. The drain is a sewer from end to end." But it is material to notice that in a later case (*Beckenham U.D.C. v. Wood*, 1896, 60 J.P. 490) the learned judge withdrew this opinion. In the latter case it appeared that a pipe or line of pipes received the drainage of more than one building not in the same curtilage. It was held that it was a sewer *below* the point at which it received the drainage of more than one building, but that it was a drain and not a sewer above that point.

The startling anomalies to which the decisions on this matter have given rise may be further exemplified by the case of *Holland v. Lazarus*, 1897, 66 L.J.Q.B. 285, which arose under s. 250 of the Metropolis Management Act. In that case a drain for the drainage of four houses by combined operation was constructed under the authority of a vestry. A pipe which carried off rainwater from the roof of a fifth house was without the sanction of the vestry turned into and connected with this drain:—It was held that, the rainwater pipe was a drain, and that its unauthorised connection with the drain belonging to the four houses converted the latter from the point of junction and onwards into a sewer.

In a later case (*Silles v. Fulham Borough Council*, 1903, 67 J.P 273) Vaughan Williams, L.J., pointed out that it makes no difference although one of the two drains happens to be a drain which only carries rainwater, and that the drain which carries off the water from one building and the sewage from another building equally comes within the definition of "sewer."

The extraordinary result of the foregoing cases is that a drain may become a sewer "unbeknownst" to the local authority. If



HOUSE NEAR FARNHAM, SURREY. NIVEN, WIGGLESWORTH AND FALKNER, ARCHITECTS.

This house, an example in the modern Georgian manner, is built in red brick, with stone dressings to the porch, brick quoins relieving the surface at the corners of the bays, &c: The windows are of wood, painted white, The bricks are 2 in., carefully selected for colour. The result is most subdued; an effect of great quietness was aimed at, and, it is believed, has been attained.

one man connects his drain to that of his neighbour, the part which leads their joint sewerage to the sewer may become repairable by the local authority.

The next important section to consider is s. 19 of the Public Health Acts Amendment Act 1890, which provides as follows: (1) Where two or more houses belonging to different owners are connected with a public sewer by a single private drain, an application may be made under section 41 of the Public Health Act, 1875 (relating to complaints as to nuisances from drains), and the local authority may recover any expenses incurred by them in executing any works under the powers conferred on them by that section from the owners of the houses in such shares and proportions as shall be settled by their surveyor or (in case of dispute) by a court of summary jurisdiction.

(2) Such expenses may be recovered summarily or may be declared by the urban authority to be private improvement expenses under the Public Health Acts and may be recovered accordingly.

(3) For the purposes of this section, the expression "drain" includes a drain used for building.

The simple application of this section would seem to be that where there are six houses in a row all belonging to different owners, and the drain which runs under them all is connected with the sewer by a pipe, that pipe is a single private drain, and the owners may be called upon to pay as laid down in the section. What, then, is a "single private drain"? It turns upon the question whether the houses which it drains are owned by one man. The case of *Jackson v. Wimbledon U.D.C.*, 1905, 69. J.P. 225, affords a striking illustration. In that case twelve houses forming part of a crescent, numbered with odd numbers from 51 to 73, were the property of one owner, No. 75 belonging to another person, and Nos. 77 to 81 to a third person. At the rear of these sixteen houses ran a main or common drain which was connected with the public sewer in front of such houses by a branch drain, which ran between the houses numbered 73 and 75, at about right angles to the road, under a narrow strip of land, between such two houses, which was unbuilt upon. Each of the sixteen houses connected with the main or common drain by means of branch drains, which conveyed the sewage of each of the houses to the main or common drain and thence through the branch drain into public sewer in front of the houses. The main or common drain and branch drain were constructed wholly upon private property. A nuisance having arisen in the main or common drain and branch drain, a notice was served upon the owners to do the necessary repairs and works to abate such nuisance. The sanitary authority, under S. 41 of the Public Health Act, 1875, entered into and did the work and demanded from the owner of Nos. 51 to 73 his apportioned expenses under S. 19 of the Public Health Acts Amendment Acts, 1890. He did not dispute that the branch drain was a single private drain. It was held that the main or common drain at the rear of the houses Nos. 51 to 73 (odd numbers) was a public sewer, and that the owner was not liable to pay for the repair thereof.*

Here was an extraordinary anomaly. The sewerage running from the houses of the owner of Nos. 51—73 first ran in private drains under the control of the owner, then into a sewer repairable by the local authority, then into a single private drain, and finally into a sewer again! If the decided cases lead to such extraordinary results it is small wonder that property owners and builders are so often plunged into costly litigation.

The most recent case only makes more confusion. We refer to *Wood Green U.D.C. v. Joseph*, 1908, 72, J.P. 393. In that case a row of houses, of which six belonged to the respondent, and the remainder to other owners, were drained by a system of pipes arranged as follows: The houses were drained in pairs; each house of a pair was drained by a separate pipe which discharged into a pipe common to both houses, and each common pipe discharged into a line of pipes laid in private ground behind the houses, which

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*A diagram showing the exact arrangement of the drains and sewers is to be found in the report *ubi supra*, and helps one to understand the case.

conveyed the drainage to a public sewer. It was admitted by the appellants that the common pipes through which the drainage of the respondent's house passed were sewers within the meaning of the Public Health Act, 1875. It was held by the House of Lords that the respondent's houses were not connected with the public sewer by a single private drain within the meaning of S. 19 of the Public Health Acts Amendment Act, 1890, and that, therefore, the respondent was not liable under that section and S. 41 of the Public Health Act, 1875, to contribute to the expense of repairing the line of pipes behind the houses. The House of Lords held that, on facts stated in the special case, it was not shown that the line of pipes in question was a single private drain.

The whole situation with regard to these vexed questions was accurately summarised by Mr. Justice Channell in the case of *Haedicke v. Friern Barnet U.D.C.*, 1904, 68 J.P. 473, when he said:—

"But it is right to point out that the real difficulty in the way of the Courts doing justice in so many of the cases on this subject arises from the automatic vesting in the local authorities of all sewers, and the automatic imposition of liability for their maintenance and repair by reason merely of the construction and the purpose they serve, and without any assent or acceptance on the part of the local authority. If it were provided that no sewer should be repairable by the local authority until adopted and taken over, as is the case with a new highway, proper provision being, of course, made for requiring local authorities to take over such sewers on notice, and on their being put in proper order, all the difficulties would disappear. The difficulty as to the extent of a surreptitious and wrongful joiner of one drain with another, the difficulty of knowing on whom the liability to repair a particular structure is, would all be got rid of, and, so far as I see, the existing machinery would all work satisfactorily as regards all drains or sewers made after such an amendment of the law. It is a discredit to our legislators or the departments of the executive which have charge of such matters that so simple an amendment of the law should not have been made long ago, as for the last fifteen years or more there has been constant litigation on these points. Of course, if there is to be an amendment of the law, it would be desirable, besides the simple amendment required, to prevent difficulty as to future constructions, to have some declaratory enactment dealing with existing structures, and I presume it is the difficulty of framing satisfactorily such a declaratory enactment which has led to there having been as yet no amendment of the law."

Enough has been said to show that a very short Act of Parliament would be sufficient to put an end to the anomalies which have laid such a burden of litigation on property owners and the rates. A householder who is served with a notice to pay a portion of sewerage expenses does not know where he is, and, as we have seen, the lawyer can do but little to help him out.

The Art Department of the City and Guilds Technical College, Finsbury, under Mr. A. F. Brophy, has for the second time scored a success in sculpture by one of its students, carrying off in the Royal Academy competitions the gold medal and travelling scholarship (in sculpture) of £200. On the first occasion, in 1896, the successful sculptor was Mr. Gilbert Bayes, who had been trained by the late Mr. W. R. Wright in the art classes at Finsbury. Mr. Wright died in 1903, and Mr. Bayes succeeded him as modelling master. The second success, just announced, is that Mr. Alfred Buxton, who, entering in 1900 under Mr. Wright, and continuing under Mr. Bayes, has now, after a connection of nearly nine years with the school, won the prize most coveted by young sculptors in England.

Obituary.

Mr. G. C. Sherrin.

The death is announced of Mr. George Campbell Sherrin, F.R.I.B.A., of The Gate House, Ingatestone, Essex, and 44, Finsbury Square. Mr. Sherrin, in his earlier years exhibited with some success at the Royal Academy, and among his best work was a picture of The Gate House Ingatestone. The originality and beauty of his designs exercised a considerable influence on architecture in Essex, where he began his career. He restored Lord Petre's seat near Brentwood, and reconstructed and built residences in all parts of that county and in Surrey, Sussex, and the Isle of Wight. He also designed the Alexandra Hotel, Dovercourt, and the Southend Kursaal. Among his London works were Rayleigh House, Chelsea, for the Hon. Richard Strutt, and Cannon Street Buildings, offices in Carey Street, Lincoln's Inn, St. Mary-at-Hill House, Eastcheap, and premises in Clarges Street, Piccadilly, and Finsbury. As architect to the Metropolitan Railway Company, Mr. Sherrin rebuilt Moorgate Street Station, Kensington High Street Station, with its arcade and adjoining shops, South Kensington Station, and Gloucester Road, the Monument, and Mark Lane Stations. About sixteen years ago he reconstructed Spitalfields Market. The branch of his work which perhaps afforded him most satisfaction was that connected with religious buildings, especially the dome of the Brompton Oratory, the the new buildings at Douai College in France, and the re-erection in Eldon Street, of the church of St. Mary's Moorfields. It is appropriate, therefore, that in the last-named building there was sung on the day of his funeral a solemn requiem mass. The funeral partly afterwards travelled to Ingatestone, the interment taking place in the neighbouring parish of Frierning. Mr. Sherrin leaves a widow, with three sons, one of whom, Mr. Frank Sherrin, had been associated with him for many years in his practice, and three daughters.

Mr. John Angus.

Mr. John Angus, a well-known Edinburgh builder, has just died at his residence, 6, West End Place, Edinburgh, in his sixty-first year. Mr. Angus, who commenced business over thirty years ago, was a native of Crief. He was a member of the Building Trade Exchange, and had contracted for H.M. Board of Works.

JAPAN-BRITISH EXHIBITION,

A meeting has been held of the "Public Health and Sanitation" Committee, under the Presidency of Mr. H. D. Searles-Wood, F.R.I.B.A. The committee itself is formed as follows:—Mr. H. Adams, M.I.C.E.; Mr. T. W. Aldwinckle, F.R.I.B.A.; Mr. H. P. Boulnois, M.I.C.E.; Professor H. R. Kenwood, M.B.; Colonel J. Lane Motter, R.A.M.C., M.A., M.D.; Dr. Samuel Rideal, F.I.C.; Mr. H. Saxon Snell, F.R.I.B.A.; Mr. W. C. Tyndale, M.I.C.E.; Mr. J. E. Wilcox, M.I.C.E.; Mr. J. E. Wroth, M.I.C.E., of the London County Council; and (ex officio) Sir John Cockburn.

The effect of the meeting is that special efforts are to be made to ensure that the public health and sanitation section, concerning as it does the welfare and comfort of the community, shall be one of the most important at next year's great undertaking, and shall bear a favourable comparison to the great demonstration to be made by our Japanese allies who, in peace and war, have proved themselves to be distinguished sanitarians. A classification for the section was agreed to which embraces schools, prisons, barracks, camps, building material, dairy appliances, apparatus for water supply, heating apparatus, lighting and ventilation, clothing, domestic appliances, means for the development of the physique, and so on. In order to carry out the enormous amount of work which this represents, it was decided to appoint provincial sub-committees for Leeds, Birmingham, Newcastle, Glasgow, Edinburgh, Cardiff, Liverpool, Manchester, Bristol, Bublin, and all the great industrial and mercantile centres. A feature of the section is to be its attractiveness from a spectacular as well as from an educational point of view.

APPOINTMENT OF WEST RIDING EDUCATION ARCHITECT.

The appointment of an architect to carry out the work of the Education Authority for the West Riding has been made. In response to an advertisement, 236 applications for the position were received, and the successful applicant eventually proved to be Mr. J. Stuart, who has been in the employment of the West Riding County Council for the past nine years. A special committee examined the 236 applications, and selected eight of the candidates to be interviewed. These were afterwards reduced to three—Mr. Stuart; Mr. George C. Lowbridge, deputy architect to the Staffordshire Education Committee; and Mr. Arthur L. Roberts, of Winchester, chief architectural assistant to the Hampshire County Education Committee. These three attended before the Finance Committee of the County Council, who had been empowered to make the appointment, and their choice fell upon Mr. Stuart, who has had a great deal of experience in school architecture.

Societies' Reports.

Sheffield Society of Architects.

The valuable work which is being carried on by the National Trust for Places of Historic Interest or Natural Beauty was described before the members of the Sheffield Society of Architects and Surveyors at the Sheffield University, by Mr. Nigel Bond, M.A., secretary of the Trust. Mr. Bond explained that the Trust stood for the preservation of the beautiful and the historic. This country possessed a great mass of beautiful landscapes and beautiful architecture, but in diminishing quantity, and it was felt that in the interests of the nation and of national interests that as much as possible should be done, without interfering unduly with other interests, to preserve the beauty of that architecture. The Trust also stood for other interests besides the æsthetic and the architectural. There were existing many good examples of that continuity which is one of its main features, showing how one event glided, so to speak, into another, and went forward without any great breaks.

Bristol Society of Architects.

At a sessional meeting of the Bristol Society of Architects, held at the Fine Arts Academy, Clifton, a lecture was given by Mr. G. Salway Nicol, A.R.I.B.A. (Tite prizeman, 1907), on "Rome and Paris; Their Architectural Relations." The lecture was illustrated with lantern slides, and numerous photographs and sketches made by Mr. Nicol. In the unavoidable absence of the president (Mr. Green), Mr. Frank Wills presided. Mr. Nicol explained that he had spent many months in the cities of Rome and Paris sketching their streets and he brought some of his sketches with him, because without illustrations it was impossible to describe architecture adequately. He proceeded to allude to the influence of the architecture of Rome and Paris upon the whole of the Western World and the effect of the architectural tradition which was handed down from ancient Rome. He urged the importance of students studying that tradition in all its phases, both as regards design and historical development. He showed that France had availed herself freely of the teaching of Roman architecture, and pointed to the definite personal expression in the buildings of the Renaissance architects, From the buildings of Paris, he showed, much could be gathered of the character and aspirations of the French people.

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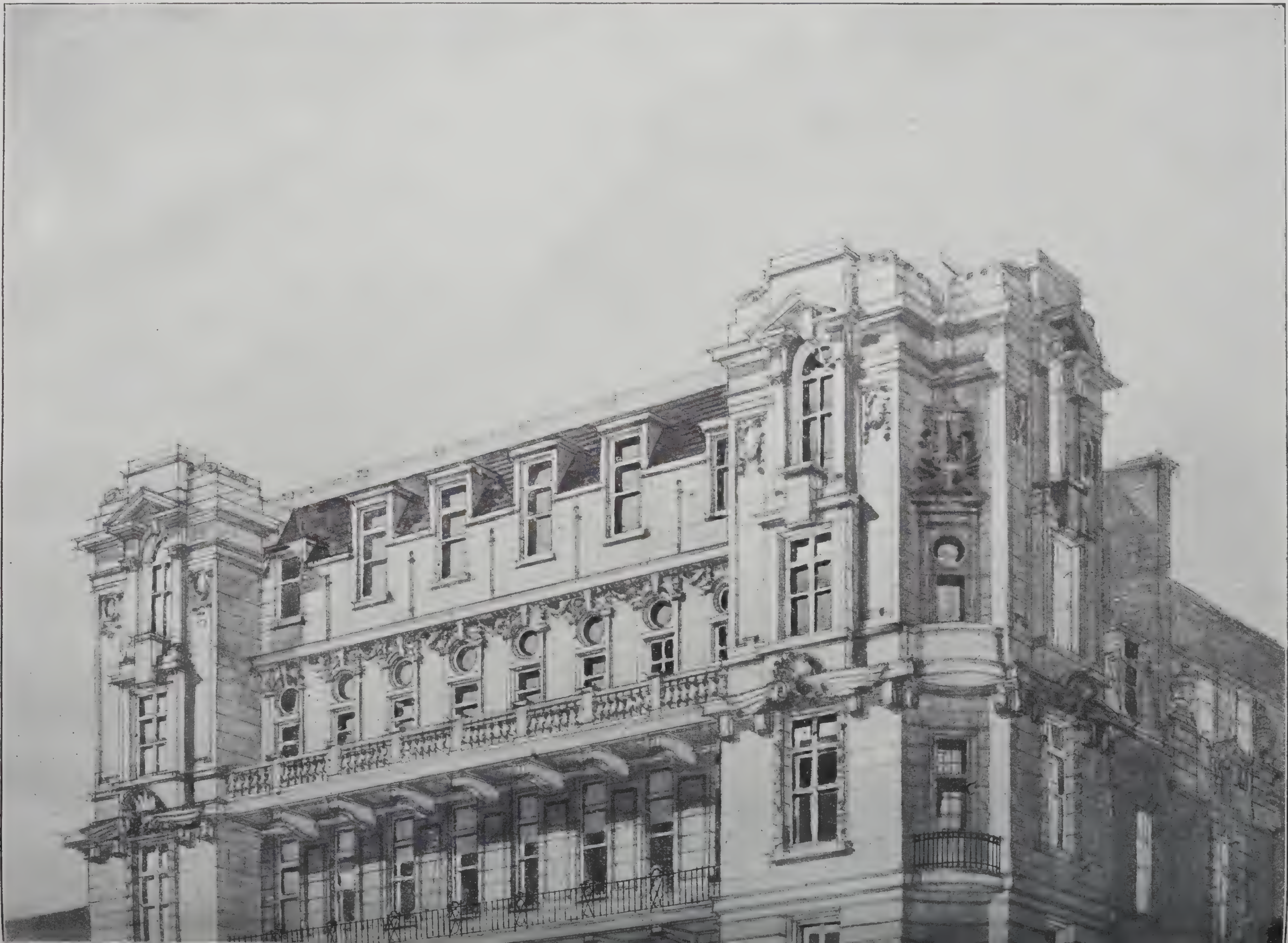

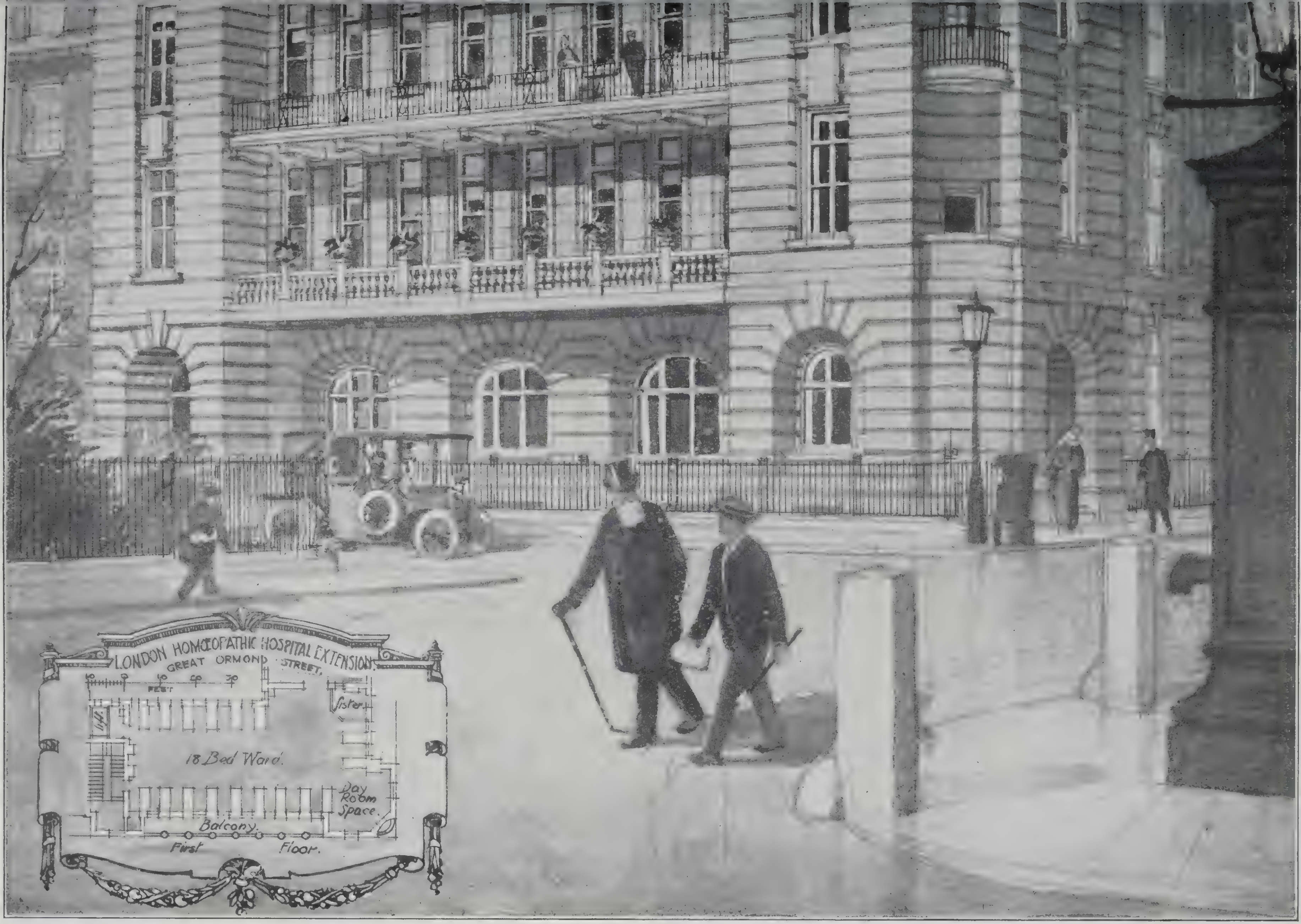
LONDON HOMŒOPATHIC HOSPITAL EXTENSION
GREAT ORMOND STREET.
FEET
Sister
18 Bed Ward.
Day Room Space.
Balcony.
First Floor.

EDWIN T. HALL, F.R.I.B.A., ARCHITECT.

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Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Dec. 31.	SOUTHEND-ON-SEA. NEW COUNCIL SCHOOL. Limited to Architects practising in the Borough. Conditions of competition and plan of site on application to J. W. Barrow, Clerk to the Education Committee, Education Offices, Municipal Buildings, Southend-on-Sea.
1910. Jan. 1.	LARNE. TECHNICAL SCHOOL IN VICTORIA STREET. For the Larne Technical Instruction Committee. Total cost, including fixtures and enclosing of ground, not to exceed £3,600, Premium, £21, merged. Successful competitor will receive commission of 5 per cent. for supervision, including plans, specifications, estimates, and *Bills of Quantities*. Particulars of Thomas Clearkkin, Secretary, Technical In-Instruction Committee, Larne.
Jan. 1— Mar. 1.	NEW BUSINESS PREMISES, LEEDS.—The Directors of the Leeds Industrial Co-operative Society (Ltd.) invite competitive drawings and estimates for new Business Premises and Offices, to be erected on the site of the old "Mercury" Office, Albion Street, Leeds. Premiums of £100, £50, and £25, respectively are offered, and will be awarded to the authors of the designs and plans placed first, second, and third by the Assessor. Conditions of competition, and lithographed plans and other particulars, will be forwarded on application to the Secretary, on or before Jan. 1, 1910, on receipt of stamped addressed foolscap envelope, accompanied with a deposit of £2 2s. Competitive designs and plans to be sent in to the Secretary, John W. Fawcett, Leeds Industrial Co-operative Society (Ltd.), 10, Albion Street, Leeds, not later than March 1, 1910. To the architect deciding not to compete, and returning all documents within seven days, the deposit will be returned.
Jan. 15.	ELEMENTARY SCHOOL, KEIGHLEY.—The Education Committee invite competitive designs and estimates for a new Public Elementary School for older children to be erected at Highfield, Keighley. Printed instructions and conditions, with a lithographed plan of the site, may be obtained on application at the Education Offices. Designs and estimates to be sent by Jan. 15 to H. Midgley, Secretary, Education Offices, Keighley. Only architects residing or carrying on business within the Borough are invited to compete.
Jan. 31.	NATIONAL MUSEUM OF WALES. The Council desires to receive competitive designs for the erection of a new National Museum at Cardiff, Three premiums are offered of £200, £150, and £100, for second, third, and fourth. The Council have appointed Sir Aston Webb, R.A., Mr. John J. Burnet A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A., as Assessors. Particulars and plans of the site will be supplied to competitors on payment of a fee of £2 2s., returnable if all papers are returned within 14 days. Inquiries to be addressed to Dr. Wm. Evans, Hoyle, Director of the Museums. City Hall, Cardiff.
Feb. 1.	OLDHAM, EXTENSION OF THE TOWN HALL. Restricted to Architects practising or residing in the Borough. Premiums of £50, £30 and £20, for the three designs placed 1st, 2nd and 3rd, and a sum of £5 will be paid to all unsuccessful competitors who send in a complete set of plans in accordance with the instructions. Plan of site, with instructions and suggestions for architects obtainable from E. C. Foote, Borough Surveyor, Town Hall, Oldham. Deposit: 21s.
Mar. 1.	GLAZED BRICKWORK DESIGNS AND ESSAYS. A committee of glazed brick manufacturers invite designs for works to be executed in glazed brickwork, also essays as to the advantages to be derived from the use of this material in accordance with conditions to be obtained from J. Johnston Green, 142, Liverpool Road South, Southport. Premiums of 100 guineas, 50 guineas and 25 guineas awarded to designs and essays jointly. Assessor Mr. Max Clarke, F.R.I.B.A., appointed by the President, R.I.B.A.
May 31.	MUNICIPAL OFFICES, KARACHI. The Municipality offer a premium of 7,500 rupees (£500) for the best design, detailed plans and estimates for new Municipal Offices. Cost not to exceed 500,000 rupees, and the style of architecture is left open to the designers. Ferrotype plans of the site and a general arrangement of the floors of the building showing the accommodation to be provided together with a copy of instructions to architects, will be supplied to intending competitors on application to the Chief Officer and Chief Engineer, Karachi Municipality. A charge of Rs. 5 will be made therefor, which will not be refunded. Each set of drawings must be sent in anonymously, but accompanied by a sealed envelope containing the author's name and address. Each set of drawings and all the documents required, including the sealed envelope, must be securely packed in a wooden box addressed as follows:—The Chief Officer and Chief Engineer, Karachi Municipality, Karachi, India, and forwarded, at the competitor's own risk and charges, in time to reach the Chief Officer on or before the 31st day of May, 1910. It is proposed to apply to Government for permission for one of the chief architects to act as assessor to decide on the design to which the prize shall be awarded. The decision of the assessor will be final and not be open to dispute. The decision of the Municipality will be made within three months of the latest date for submission of designs, and payment of one-half of the premium will be made thereafter to the author of the selected design, the balance to be paid when the further details specified in the instructions to architects have been supplied. On payment of the premium the Municipality will have all rights in the design, with power to erect the building under its own agency, either according to the design selected or with such additions or alterations as it may deem necessary.

Our Plate.

London Homœopathic Hospital.

The new wing named after Sir Henry Tyler has a frontage of 86ft. 6in. to Queen Square, and 41ft. to Gt. Ormond Street, and is seven storeys in height. The new wing contains extension of out-patients' department, new Board Room, and offices, three large wards with day and other rooms, ten private wards, and several isolation wards, etc., etc., with a second staircase at the north end.

In addition to the new wing, extensive alterations are to be made in the interior of the old part to bring it up to the present-day requirements—replanning and extending the out-patients department with new consulting rooms, theatres, etc., forming new small wards, increasing kitchen, operating theatres, etc., new boiler-house and fitters' shops, and remodelling part of the old Staff Home.

The architectural style of the new building is English Renaissance, and the external facing is of Portland stone.

The balconies on the western or Queen Square front will form a useful adjunct to the wards, enabling patients to sit in the open air in the enjoyment of a good prospect and sheltered from flanking winds.

The architect is Mr. Edwin T. Hall, F.R.I.B.A., of 54, Bedford Square, W.C. The contractors are Messrs. Holliday and Greenwood, Ltd., of Brixton, S.W., and Mr. A. Turner is the clerk of works.

The Local Government Board have agreed to make a grant of £1,000 towards the reclamation of the banks of the Wandle in the Earlsfield portion of the Wandsworth borough. When the scheme is completed the banks of the Wandle will have been converted into a picturesque boulevard. It is proposed to reclaim the banks, lay out grass walks, plant trees, and generally transform the unsightly Wandle banks into a pleasant riverside walk.

WINDOW CILLS IN BRICK BUILDINGS.

By Edwin Gunn, A.R.I.B.A.

Window cills of some sort are a necessity in buildings of every class. Small houses and other structures on a minor scale are often made or marred by petty details which in larger buildings would be relatively unimportant, and of such details the cills are not the least frequent offenders. The building construction text books, which know only stone weathered, throated, and projecting cills are probably the cause why, in the large proportion of cases, this form of cill is instinctively and often unnecessarily adopted. Many quiet brick buildings are seriously damaged in scale by clumsy stone cills.

At the start it will be well to examine the reasons why a cill must be provided to each window opening. It is not sufficient to say merely that it is to throw off the wet which would lodge on the ledge at the bottom of the window reveal, and to prevent its soaking into the wall. Some designers, recognising this portion of a cill's functions, have rashly thought that by building all frames flush, thus abolishing the reveal and consequently the ledge, all need for a cill or its equivalent would be avoided. The reason actually goes deeper. Wall surfaces of all kinds are porous to a sufficient extent to take up the casual rainspots which ordinarily fall upon them. Glass, however, being non-absorbent, allows moisture to stream down; and it is this *collected* water which would

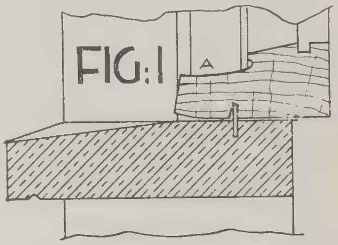
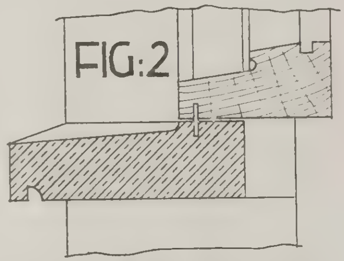


FIG:1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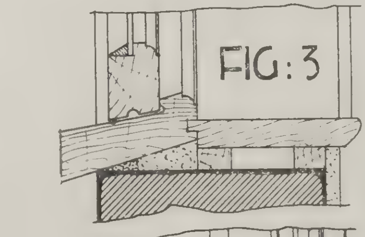
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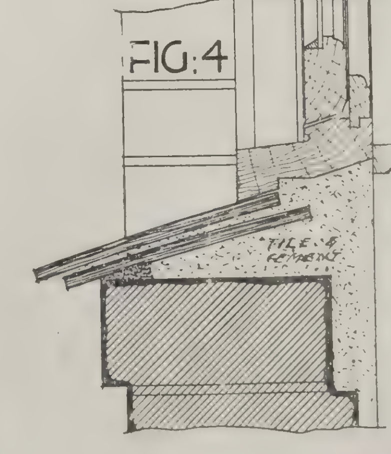


FIG:4

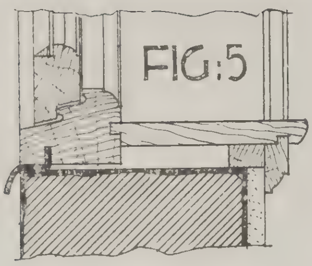


FIG: 5

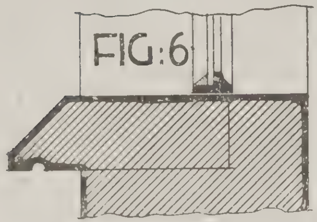


FIG: 6

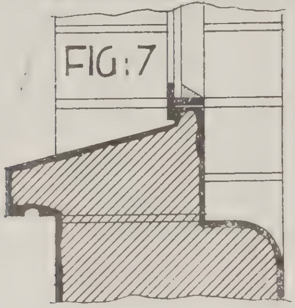


FIG: 7

tend to soak into the brickwork at the window ledge (if not protected by a cill); or where the ledge is abolished as previously mentioned, would saturate the brickwork below the window, producing in time a stained and streaky effect the reverse of lovely. In all but glazed brick facings, a projecting drip at the cill is desirable.

Stone Cills.

Where stone cills are adopted there are points to which it is well to give attention. The cill, as produced by the mason, is often like Fig. 1, the so-called throating being a shallow V-shaped scratch, and the sinking absent altogether. A more effective throating is that shown in Fig. 2, a form which secures that it shall fulfil its purpose of a drip. The groove for metal tongue is frequently worked too far back from the front edge of the cill, exposing an unnecessarily large portion of the wood cill resulting in the possibility that it may curl up and allow water to lodge thereon, thus inviting decay. As the object of the metal tongue is to exclude water, it is obvious that the less far it is allowed to penetrate, the better. In sashes with cased frames, the best position is immediately behind the outside lining, which, where carried down in front of the oak cill at the ends, forms there one side of the groove.

Wood Cills.

In cottage work where economy is of vital importance, a practicable form of treatment with flush frames is to extend the oak cill about 1½in. in front of the brickwork, working it on the slant as shown in Fig. 3. The feather-edge forms an effective drip, and if the cill is bedded on a cement fillet in front, and well grouted up with cement from behind after fixing, it makes a watertight job. The frame requires well fixing to the jambs, as the cill is practically free. Where projecting wood cills are objected to, the treatment shown in Fig. 5 is a simple one. A narrow strip of 6lb. lead is wedged into a groove previous to fixing the frame, and turned down over the brickwork, but not beaten close. Sometimes instead of fixing in a groove in the cill, the strip is made wider and copper-nailed to the back edge, extending right through the joint.

Tile Cills.

Where the frames are necessarily fixed in reveals, a variant of the cill shown in Fig. 3 may be arranged, with a weathered cill of two courses of tiles breaking joint, as shown in Fig. 4. This cill it is better not to form until the brickwork is completed (when it may be quite easily done, space, of course, being left), as otherwise the projecting tiles are likely to get displaced or damaged by rough usage before the cement sets hard. The check shown on the underside of the wood cill is desirable in exposed positions to prevent water which runs over the tile weathering from being blown through the joint between wood and cement, which of course have no adhesion. If the cement is well filled in solid it forms an efficient check.

Blue Staffordshire Cills.

Figs. 6 and 7 show two forms of blue brick cills commonly adopted in factory work, Fig. 6 being an inferior method in which a common offset brick is made use of, and Fig. 7 a more suitable one properly sunk and weathered and combining well with T section steel sashes.

Proposed New Works.

ARDROSSAN.—The Parish Council have agreed to the borrowing of £5,000 for the renovation of the County Council Poorhouse.

BARNES.—The U.D. Council have approved plans for the following:—Additions at the "Jolly Gardeners," Lower Richmond Road, Mr. W. J. Parker; plan of two shops, Sheen Lane, Mr. A. Stanley; five houses, Sheen Lane, Mr. C. Barwell; winter garden at the "Hare and Hounds," Upper Richmond Road, Mr. R. B. Rowell; four houses, Christ Church Road, Mr. C. Barwell; additions to club premises, Alder Road, Messrs. J. Harrison and Co.; seven shops, Upper Richmond Road, Mr. G. Hunt; additions to laundry premises, rear of 28b, Sheen Lane, Mr. E. Seaber; cottage, Railway Side, Mr. H. E. Retham; and eleven houses, Clavering Avenue, Barnes, Mr. T. W. Brenton.

BATH.—The L.G. Board has held an inquiry into the application of the Corporation to borrow £2,335 for alterations and additions to the Technical Schools. Mr. Mowbray A. Green is the architect.

BOURNEMOUTH.—The L.G. Board has opened an inquiry into the application of the Corporation to borrow £77,000 for the erection of a pavilion overlooking the pier approach. The proposed building includes a pavilion, large and small halls, a lounge, smoking, reading and billiard rooms, restaurant, dining room, etc., and public refreshment rooms. There is considerable opposition to the scheme, and the inquiry was adjourned sine die, the inspector, Mr. H. Shelford Bidwell, intimating that he could not attend before the third week in January.

CLYDEBANK.—The Town Council is considering the erection of a public library towards the erection of which Mr. Carnegie has offered £10,000.

GLASGOW.—The Dean of Guild Court have granted linings for the following buildings:—Walter MacDonald Bergius, engineer, engine works and offices in Dobbie's Loan; Glasgow Corporation, two pavilions at Ruchill Hospital; St. Peter's Episcopal Church, a temporary hall at the church in Gardner Street; the Progress Steel and Foundry Company, fitting shop on ground adjoining Avenue Street.

ILFORD.—The U.D. Council has passed plans for the following:—E. Silcock, house, 37, Pelham Road; W. Fletcher, Ltd., workshop in Roden Street; W. Brothers, stables rear of 174, Richmond Road; F. George, alterations to Ilford Paper Mills; W. Hancock, for Biograph Theatres, Ltd., Cinematograph Theatre, 63, High Road; E. T. Dunn, for A. Stearn and Son, shop premises, Cranbrook Road; H. E. Richards, new front to Skating Rink, High Road.

LARGS.—The Town Council has determined to build a sea wall along the Broomfields from Gogo Bridge. It has also been decided to lay a concrete footpath along the lower terrace walk of the Broomfields.

PRESTWICK.—The L.G. Board has held an inquiry into the application of the Board of Guardians for a loan of £6,000 for additional works incurred in the erection of the Booth Hall Infirmary.

RAWTENSTALL.—The Town Council has approved plans for the following:—Shops and offices, etc., Bank Street, Rawtenstall, for the trustees of Longholme Wesleyan School; bridge over Westwood Street, Reedsholme, for Messrs. Coates Bros.; four dwelling houses at Thistle Mount Avenue, Newchurch, for Mr. James Pinnington; new street at Thistle Mount Avenue, Newchurch, for Dr. Holt; plan of dwelling house, Hamer Street, Rawtenstall, for Mr. Wm. Fielding.

SLATEFORD.—The residents are raising funds for the erection of a public hall. Sir Oliver Riddell has given £100 to the fund on behalf of his wife and himself.

STOURBRIDGE AND HALESOWEN.—The Joint Hospital Committee have had plans prepared by Mr. Folkes for an extension of the Hospital at an estimated cost of £2,000.

UPTON, CHESHIRE.—The L.G. Board has held an inquiry at Chester into the application of the Cheshire County Council to borrow £82,000 for the extension of the Upton Pauper Lunatic Asylum.

WORKS IN PROGRESS AND COMPLETED.

ABERCARN.—The foundation stones of a new school in connection with Garn Congregational Church, Abercarn, have just been laid. The building when completed and furnished is estimated to cost £2,000.

BARROW.—The new laundry, which has been erected at the workhouse at a cost of £2,500, has just been opened. Mr. Fowler is the architect, and Messrs. Tullis, Neal, Bell, Walker, and Slee are the contractors for the various works.

BELLSHILL.—A new Baptist Church is now in course of erection from the design of Messrs. Miller and Black, F.R.I.B.A., I.A., Architects, of Glasgow. The church, which will provide accommodation for 550 people, is estimated to cost £2,000.

CHISWICK.—The new church of St. Michael's, Sutton Court, Chiswick, which was recently consecrated, was designed by Messrs. Caröe and Passmore, is late Gothic in style, and has accommodation for about six hundred worshippers.

COTTINGHAM.—The foundation stones of the new Council buildings, which are estimated to involve a sum of £2,260, have just been laid.

DUNDEE.—The Dundee Royal Infirmary will shortly be equipped with a new building for the treatment of out-patients. The building is estimated to cost £3,800, and will occupy the piece of ground on the west side of the Infirmary, an area of about 6,000 square feet. The architect is Mr. James Findlay, 33, Albert Square, Dundee.

EARBY, NEAR COLNE.—The new church, which was recently opened here by the Bishop of Ripon, has cost, it is estimated, about £8,000.

GLASGOW.—The new wing of the Glasgow School of Art, which has just been opened, has a frontage of 246ft. in length and 93ft. in height. It stands on a hill in the west centre of the town, and its back elevation is nearly a third more than the height of the front. The building is the work of Mr. Mackintosh, the Scottish architect, whose art has aroused much enthusiasm in Germany. Among the old students of the school are Sir James Guthrie, Mr. John Lavery, Mr. E. A. Hornel, Mr. A. Roche, Mr. George Henry, Mr. Francis Dodd, Mr. Muirhead Bone, and Mr. D. Y. Cameron.

HYDE.—The Cheshire Education Committee have let a contract for the erection of a new county school at Hyde for the sum of £12,345.

LEVEN.—The Parkhill Public School, Leven, which has been erected at a cost of about £8,000, was recently opened. The new school, a two-storey building, which will accommodate 480 pupils, consists of assembly hall, eight classrooms for 60 pupils each, four teachers' rooms, cloakrooms, lavatories, caretaker's closets, heating chamber, etc. The

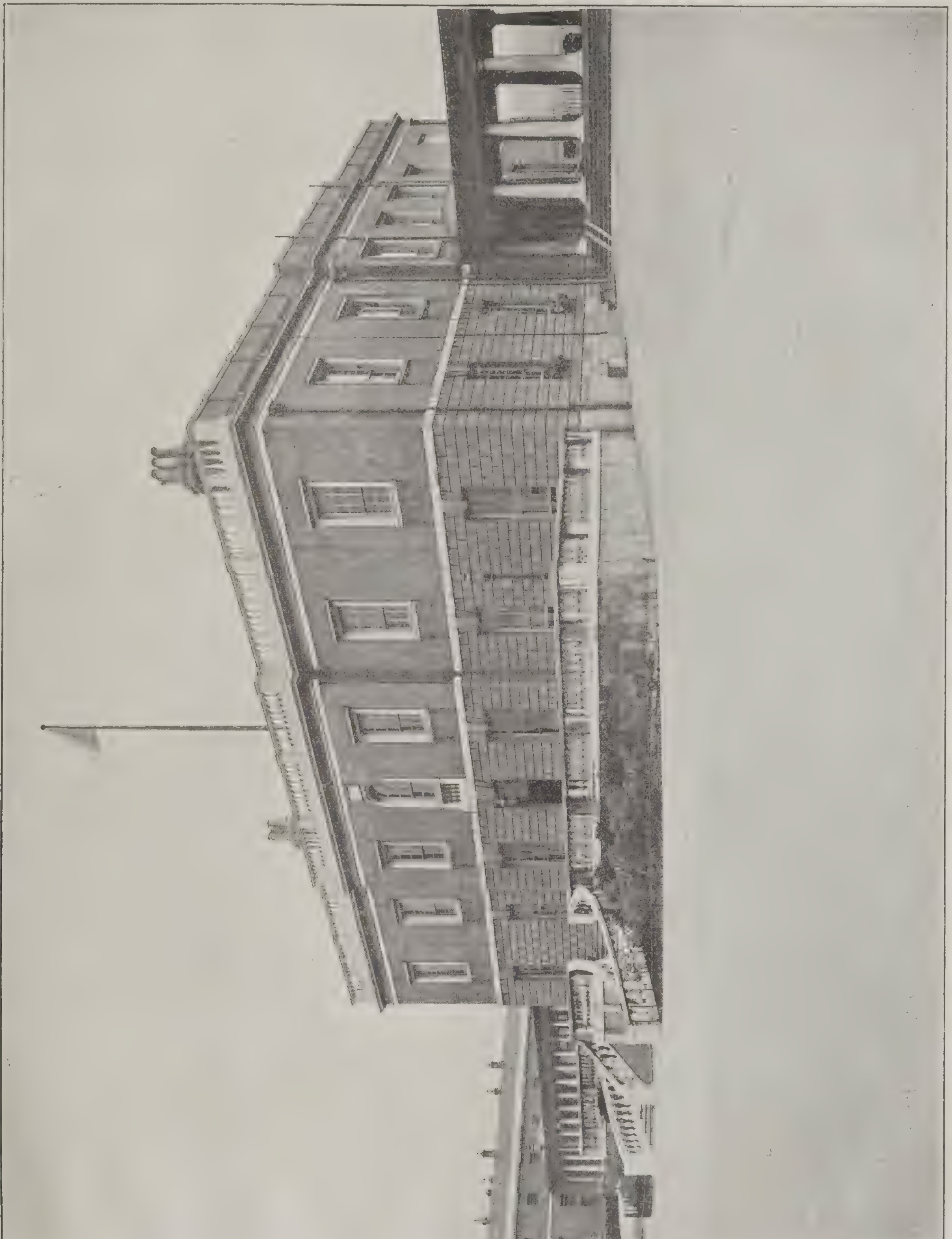


Photo: E. Dockree.

THE QUEEN'S HOUSE, GREENWICH. INIGO JONES, ARCHITECT.

building is almost wholly of brick, there being only freestone dressing at the staircases and a stone cornice at the wall-head. The architects were Messrs. Haxton and Walker, Leven, and the clerk of works Mr. James Wilkie, Leven. The principal contractors were:—Masons, Messrs. James Kinnear, Sons, and Co., Edinburgh; joiner, Mr. Alex. Waddell, Burntisland; plumber, Mr. Alex. Stewart, Cupar; plasterers, Messrs. W. and J. Easton, Kirkcaldy; slaters, Messrs. Chas. Neave and Sons, Leven; painters, Messrs. J. and J. Brown, Leith.

LONDON.—Considerable progress has been made with the new embankment wall at the river side at Westminster, in connection with the building of the new hall for the London County Council. The contractors have already commenced operations, the tidal waters having been shut out by a cofferdam, which runs along the whole frontage. A layer of concrete five or six feet thick will be placed on the clay bed throughout the whole area to be covered by the building. The embankment wall is being erected in Welsh granite, of which about three thousand tons will be used.

LONDON, N.E.—We are informed that Messrs. E. A. Roome and Co., of 36, Basinghall Street, E.C., and Urswick Road, Homerton, N.E., have secured the contract for the completion of St. John the Baptist Church, Holland Road, Kensington, under the supervision of Messrs. James Brooks, Son, and Adkins.

LONDON, S.W.—The new Trevelyan Hall, Westminster, which was recently dedicated by the Bishop of Kensington, stands in St. Ann's Lane, Great Peter Street. It adjoins, and is an extension of, the mission buildings of St. Matthews. On the first floor, approached by a separate entrance, is the Trevelyan Hall, having an area of some 1,560 super feet. An important painting by E. de Morgan, entitled "Attainment," is the chief ornament of the interior. The building is warmed by hot water radiators, and lighted by electricity, a secondary system of gas lighting being provided. There are two emergency exits and staircases as well as the main staircase. The frontage to St. Ann's Lane is largely of terra cotta and partly of glazed brick. The work has been carried out from the designs of Mr. Harold S. Rogers, architect, of 7, Dean's Yard, by Messrs. F. C. Hoskins and Co., of 4, Tufton Street, S.W. The following are some of the contractors with their respective works:—J. C. Christie, Aldgate, warming and lighting; Mark Fawcett and Co., Greenwich, fireproof flooring and steel roof principals; Samuel Haskins and Co., Old Street, E., revolving partition; Wm. Pearce, Ltd., Birmingham, iron casements and glazing; Shaw's Glazed Brick Co., Whitekirk, Darwen, facing bricks and terra cotta; Winser and Co., Buckingham Palace Road, drainage and sanitary fittings.

RICHMOND, YORKS.—The brass tablet which has been inserted in the wall of the Parish Church in memory of the late Lord John Lawrence was recently unveiled. The tablet was the work of Mr. John Phipps, of London.

SABDEN.—The new Baptist Church and schools, which are now in course of erection, have been designed by Mr. F. J. Parkinson, of Blackburn, and are estimated to cost £4,800. The church is planned to seat about 400 people. Both buildings are faced with local rubble (tuck pointed), with Whalley stone dressings.

SACRISTON.—A new workmen's club and institute, built at a cost of £3,400, has just been opened here. The building is constructed of brick, the front being faced with Accrington red-pressed facing bricks. The stone dressings were from the Blaydon quarries. Mr. G. T. Wilson, Blackhill, is the architect.

USHAW MOOR.—Foundation stones of a new group of cottage homes have just been laid. The group consists of twenty cottages, and the cost of erection is estimated at £2,500. The site affords a pleasant view of the Dearness Valley, and the cottages will face direct south. Each house will be self-contained, and will consist of a kitchen, bedroom, scullery, and pantry. Mr. C. Johnstone, of Bishop Auckland, is the architect, whose services have been given gratuitously; and Mr. Herbert Baines, of the same town, is the builder.

WORKSOP.—A new roller skating rink, which is now in course of erection, will cost approximately £2,000. The skating area is nearly 7,000ft., the total area covered being about 9,000ft. The architect is Mr. F. Hopkinson, Worksop, and the contractors Messrs. G. Henderson and Sons, Newark, in conjunction with Messrs. Davis Bros., of Wolverhampton.

LIVERPOOL PAINTERS' DISPUTE SETTLED.

Mr. Bertram B. Moss, secretary of the Liverpool Master Builders' Association, reports the settlement of the dispute with the painters. In August, 1907, a five years' agreement was signed by the operative painters, and everything ran smoothly until February this year, when the painters belonging to shops of two of the members of this association struck work owing to these firms taking men on at the various jobs without paying expenses and walking time. Negotiations took place with the operatives, but they refused to submit the matter under the rules to a Conciliation Board, with the ultimate result that the Liverpool Master Builders' Association wrote to the operatives saying that as they refused to abide by the rules, the agreement was at an end, and for some months the operatives went on working without any agreement between the two bodies. Early in November the employers decided, as there was no agreement, to reduce the men's wages ½d. per hour, with the result that this brought the operative societies into communication with the association again, and on December 1st an agreement was signed bringing in the previous five years' agreement, and agreeing to submit the matter in dispute to the decision of an independent arbitrator. A clause in the agreement also stated that after the decision was given, neither side should have any by-law or rule in any way counteracting the rules in existence between the employers and operatives.

The arbitration has taken place, and the arbitrator, Mr. H. Neville Bewley, solicitor (Messrs. Payne, Frodsham and Bewley, 9, Harrington Street, Liverpool), has given his award as follows:—

"The words to be interpreted were: 'This rule applies only to men sent from the shop and not to men engaged and paid at the job.'

"1. That any interpretation of the words above mentioned (so far as I was requested by the parties at the said reference to interpret the same), is that the said words authorise the members of the Liverpool Master Builders' Association to engage and pay men at the job, and that such men are not entitled to the benefit of the walking time allowance and payment of fares mentioned or referred to in the earlier part of the said rule.

"2. And that the said Liverpool Operative House Painters' Old Society, and National Amalgamated Society of Operative House and Ship Painters and Decorators (Liverpool District Committee) shall bear and pay eleven pounds, five shillings, the costs of this my award."

It will be seen from the above that the employers' contention was right, and employers are now, without any trouble, allowed to take men on at the various jobs, without having to pay expenses and walking time.

In order that employers will not discharge a man at the shop and send him to a job, with a view to saving walking time and expenses, the following rules have been agreed upon between the employers and operatives, for the guidance of members:—

"1. An employer can place a board outside his office or yard stating that painters are wanted at such and such a job. Application only at the job.

"2. In the event of a board not being used, if a painter applies at the office for work, the employer can say: 'We want painters at such and such a job, if you like to apply.' Also make it clear that no expenses will be allowed.

"3. In the event of a painter being discharged at the shop, and there is no board in use as suggested above, nothing to be said to such painter about having work at a job outside if he likes to apply."

Notes and News.

The London County Council have adopted the report of the Highways Committee, who stated that it had been necessary, in accordance with the request of the Port of London Authority, to remove certain old pile stumps at Waterloo Bridge which were considered dangerous to navigation. As the piles formed part of the foundation of Waterloo Bridge, very great care was needed in dealing with them, to ensure that the stability of the structure was not affected. The whole of the work had, of course, to be done by divers. Some further piles have been found to exist under the bridge in the centre of the most northerly arch, and the committee promise to report, if necessary, at a later date, as to the action which it may be desirable to take in the matter.

* * *

There has just been opened a great boulevard joining the three industrial cities of the Departement du Nord, which with the system of electric tramways in connection with it constitutes a most remarkable work, on account both of its extent and of the rapidity with which it has been carried out. The boulevard was constructed in three years. It has a length of 14.5km., and includes two branches, one starting from Roubaix, 4.036km. long, and the other from Tourcoing, 6.7km. long. The two branches unite in a common thoroughfare, 2.5km. long, which ends in the centre of Lille. The boulevard is 50 metres wide. On each side, bordered by footways 3.5 metres wide, is provided a roadway 5.5 metres wide, reserved for heavy traffic. A central roadway of 9 metres is allocated to light vehicles and motor-cars. Between it and the other roadways there are two raised roads 11.5 metres, wide, for foot passengers, cyclists, horse-riders, and a tramway.

* * *

A viaduct has recently been constructed of reinforced concrete to carry the Linda Vista Avenue across the valley of the Arroyo Seco, in Pasadena, California. The viaduct, which is 400ft. in length, with a 20ft. roadway and two 4ft. sidewalks, is about 50ft. above the bed of the river, and consists of six girder spans resting on five towers. Each tower is composed of four concrete columns 18ins. square and over 50ft. in height, each column being reinforced with eight 1¼in. round steel bars extending down to the piers. The towers are constructed with longitudinal and transverse struts, varying in size from 10ins. by 18ins. to 12ins. by 24ins., reinforced with four ⅞in. twisted steel bars. The deck consists of a reinforced concrete slab, longitudinal stringers, transverse deck beams, and girders. The stringers are 17ft. 3ins. long and 6ft. on centres, with a cross section of 7ins. by 19½ins., reinforced with four 1in. twisted steel bars. The deck beams between the large girders have a cross section of 10ins. by 25ins., and are reinforced with six 1⅛in. twisted steel bars. In the tower spans these transverse beams were increased to 12ins. by 30ins. to add lateral stiffness. The large girders, 51ft. 9ins. long, extending from tower to tower, have a cross section of 16ins. by 58½ins., and are reinforced with nine 1⅜in. twisted steel bars in tension and three 1⅜in.

round steel bars in compression. The bridge was designed to carry a 20-ton roller, but the heaviest one that was available weighed 14 tons. In the tests which were made with this roller, the greatest deflection that occurred in any girder amounted to 1-1,200 of the span. The engineers were Messrs. Mayberry and Parker, of Los Angeles.

* * *

The erection of the new south transept of Selby Abbey is to be entrusted to Mr. Thomas S. Ullathorne, of Selby, who carried out the recent restoration. It is hoped that by the time this portion of the work is completed funds will be forthcoming to erect the superstructure, which will be open to tender.

* * *

The subject given in 1909 for the Essay in competition for the Henry Saxon Snell Prize was "The Principles of Heating and Ventilating Public Buildings, with descriptive details and illustrations of the best systems." It is officially announced that fifteen essays were sent in, and they have been brought under the consideration of the Council. Acting upon the advice of the adjudicators appointed, the Council have awarded the prize offered of £50 and a bronze medal of the Institute, to Mr. Alfred E. Wheeler, West Ealing, writing under the motto "Hellios." Two of the other essays showed exceptional merit, and the Council have therefore decided to increase the amount of the award by £20, and to divide this amount equally between the writers of these two essays—to Mr. J. Roger Preston, M.R.San.I., Stourbridge, writing under the motto "Glow-worm," £10; and to Mr. E. Thomas Swinson, M.R.San.I., Feltham, writing under the motto "Dum Spiro Spero," £10.

* * *

Lord Ashton opened on Monday last the new Town Hall at Lancaster, which, fully equipped and furnished, is a gift from him to his native town. The building has cost £145,000, and additional expenditure upon a statute of Queen Victoria in front of the hall has also been borne by Lord Ashton. The structure is of English Renaissance design, and contains 115 rooms. The public hall will accommodate nearly 2,000 people, and contains an organ. The height of the building to the top of the tower is 146ft. In the tower is a four-dial clock, the bells of which bear an inscription recording Lord Ashton's generosity. Accommodation is provided for all departments of the corporation beneath one roof. Since the death of the architect, Mr. E. W. Mountford, F.R.I.B.A., the work of supervision has been in the hands of his partner, Mr. F. Dare Clapham, F.R.I.B.A.

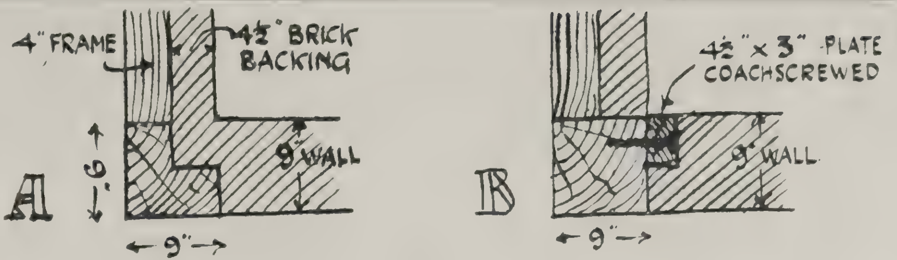
* * *

The Rev. R. C. Bates, Rector of Churchill, near Worcester, is appealing for a sum of £300 to enable him to re-open the nave of his church. On his appointment, six years ago, the building was in a dangerous condition, and money was collected to restore the walls and roof. The sum now asked for is to enable the nave to be fitted for worship. In the churchyard is a gravestone recording the burial of "English nuns of the Order of Poor Clares, who, when banished from Dunkirk by the fury of the French Revolution found a refuge in Churchill," an asylum having been given to them by the then squire, Mr. Berkeley, a member of an old Roman Catholic family. The parish is on the high road from Stratford-on-Avon to Worcester, and Shakespeare must have ridden through it when he went to the Cathedral city before his marriage to make the affidavit which is to be seen by visitors at the Edgar Tower. The church is Fourteenth Century, and a Saxon church preceded it..

GUILD OF ARCHITECTS' ASSISTANTS.

The S. Wales branch of the above guild held the first of a series of meetings in Cardiff, on Friday evening, December 17th. The Cardiff, S. Wales, and Monmouthshire Society of Architects kindly lent their room for the purpose.

A paper was read by Mr. S. Bowen Williams on "Llandaff Cathedral," and was followed by a very interesting discussion. Votes of thanks to the speaker, and the society for the use of the room, were then passed.



ILLUSTRATING REPLY TO "SHREWSBURY—H."

The meeting was well attended, and augurs well for the success of the movement in S. Wales.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himsel. of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable: and it must be understood that both question and reply will, as a rule, be published in these columns

Value of Book.

Long Eaton.—L. E. writes:—"I have a book entitled Rural Architecture in the Chinese Taste,' being designs entirely new, for the decoration of gardens, parks, forests, inside of houses, etc., on sixty copper plates, with full instructions for workmen, also a near estimate of the charge and hints where proper to be erected; the whole invented and drawn by William and Tho. Halfpenny, architects. Divided into four parts. The 2d. Edition, 1752. Printed for and sold by Robert Sayer, map and printseller at the Golden Buck, opposite Fetter Lane, Fleet Street. Is this of any value?"

—Halfpenny's "Rural Architecture in the Chinese Taste" has not very much value, say, from 10s. to 15s.

Fireproofing Floor.

Skipton-in-Craven.—"Yorkshire" writes:—"(1) What is the best means of making a present floor of 9in. by 2in. wood joists 12in. apart (floor boards already taken off) fireproof? My idea was to put pugging boards or expanded metal half-way down the joists and fill up to level of floor with 5¾in. coke breeze concrete. (2) To make a present ceiling fireproof: would the best means be to fix ferro-concrete 1½in. slabs to underside of joists and skim with plaster?"

—Coke breeze concrete put as pugging between the fir joists would be very heavy and only be partially effective in producing a fire-resisting floor. A better method would be to strip the present ceiling and fix expanded metal lathing covered with fire-proof plaster. Henry Adams.

Half-timbered Construction.

Shrewsbury.—H. writes:—"The enclosed sketch (not reproduced) shows a half-timbered gable end with the 9in. × 9in. corner post butting against a 9in. brick wall, which is not timbered, thus leaving a straight bull joint between the post and wood through to the inside for a length of 15ft. As the work settles, this joint is certain to open and develop a crack through to the inside of the house. Kindly suggest a sound method of bonding the wood post and wall together. The 9in. × 9in. square post must be adhered to. Hoop iron has been considered, also a 4½in. brick casing round post inside, but neither is favourably received."

—The construction is bad, and if the 9in. × 9in. corner post must be adhered to, its defects can be only partially overcome. The end framing is, of course, already partially tied in by the wall plate of the roof, and presumably by an intermediate floor; it can be further secured by wrought iron anchors screwed to the post and built into the brickwork at intervals, but the joint is practically certain to open more or less owing to shrinkage of the timber. The post should be rebated as shown in sketch A to allow the brick backing to pass behind it, but if it may not be cut, a strip of 4½in. × 3in., well coachscrewed on in the position shown in sketch B will prevent the crack (when it occurs) from extending in a straight line through the wall, as timber can be secured closely to timber, though not to brick. G.

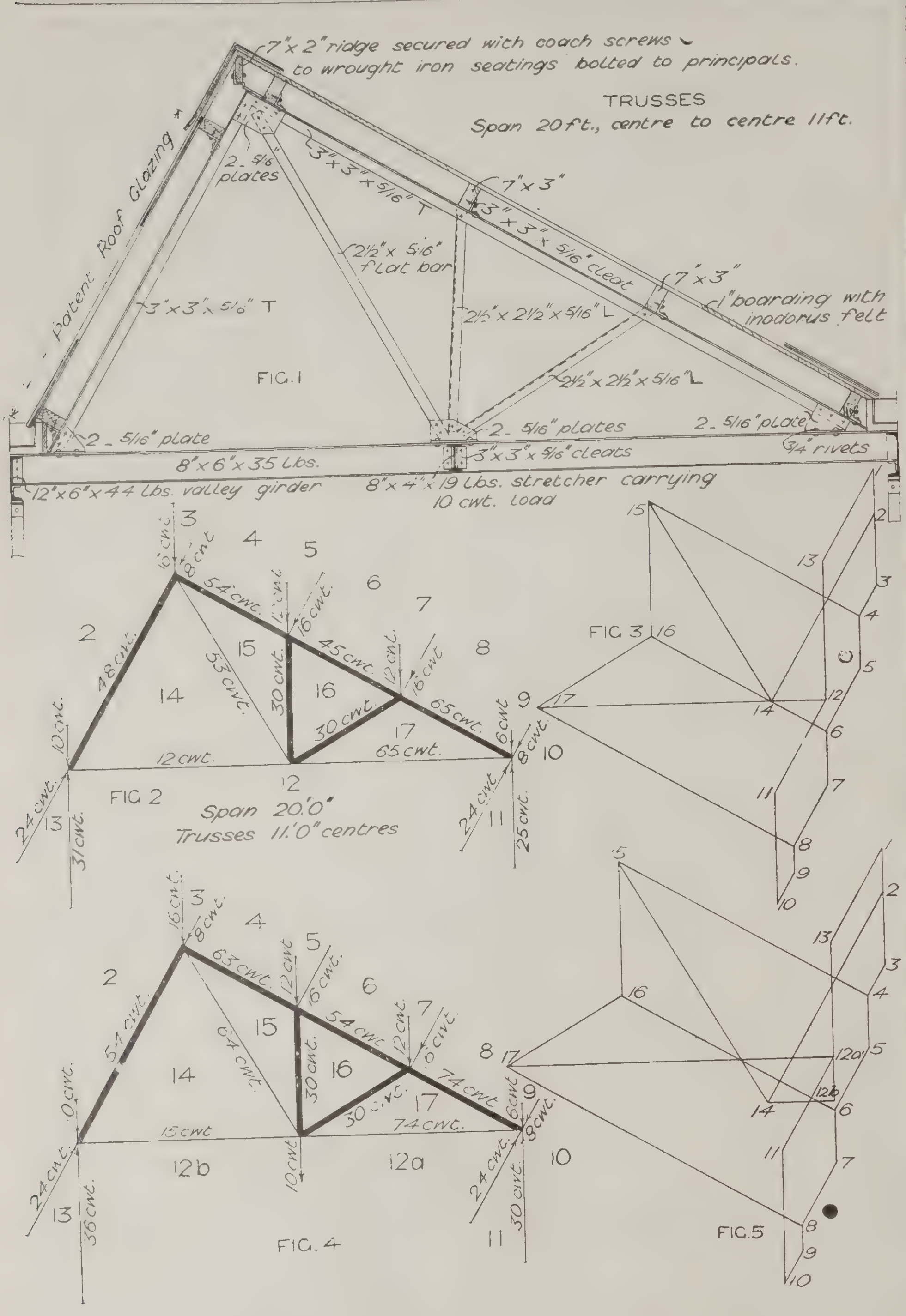
Factory Roof.

Kirkby.—Hosiery writes:—"I send herewith tracing of a roof truss [not reproduced] which I am thinking of using on a factory, and should be glad to have the opinion of your expert as to the sizes of the members of the truss. The roof on the flat side will be covered with slates. Distance centre to centre of principals, 11ft. The 8in. × 4in. × 19lbs. stretches are put in, partly for stiffening and partly for fixing stays from the machinery, and the 8in. × 6in. tie beam is for a similar purpose. There will be a good number of these trusses, and I am anxious to know whether any saving can wisely be effected. I cannot find a stress diagram of this class of roof in any text book. The position is not an exposed one."

—The design for the roof is shown in Fig. 1, and allowing for a structural load of 21lbs. per ft. sup. and a normal wind pressure of 28lbs. per ft. sup., the frame diagram with loads will be as in Fig. 2. The re-actions may easily be calculated and the stress diagram constructed as in Fig. 3, and the stresses marked on the frame diagram. The calculations will be as follows. For the principal rafter with a stress of 65 cwt. or 3.25 tons and unsupported length of 5ft. 9in. try the 3in. by 3in. by 5-16in. tee section,

Then $W = \frac{F\,S}{1+\frac{1}{a}\left(\frac{l}{d}\right)^2} = \frac{6{\cdot}5\times1{\cdot}76}{1+\frac{1}{750}\left(\frac{69}{2{\cdot}8}\right)^2} = 6{\cdot}33$ tons, so that this section will be rather more than enough, but it should not be made less, and the same section will also be sufficient for the rafter on glazed side of roof. For members 15-16 and 16-17 with a stress of 30 cwt. or 1.5 tons and unsupported length of 5ft. 9in. try a 2½in. by 2½in. by 5-16 in. angle section. Then $W = 1 + \frac{F\,S}{1+\frac{1}{a}\left(\frac{l}{d}\right)^2} = \frac{6{\cdot}5\times1{\cdot}47}{1+\frac{1}{750}\left(\frac{69}{1{\cdot}7}\right)} = 3$ tons so that this section will do for both members. Allowing 6½ tons per sq. in. member 14-15 will require an area of $\frac{53}{6{\cdot}5\times20} = 0{\cdot}4$ sq. in. net, requiring a 2½in. by 5-16in. flat bar.

Allowing for a hanging load of 10 cwt. at



ILLUSTRATING REPLY TO "KIRKBY—HOSIERY."

centre of truss the frame diagram will be as Fig. 4 and the stress diagram as Fig. 5. It will be seen that the stresses are not greatly increased and that the members previously assumed will still be sufficiently strong. There should be two rivets at the end of the inclined tension bar instead of one, and in order to obtain room for the extra rivet the plates must be increased as shown in Fig. 1.

Henry Adams.

Defective Mortar.

Leeds.—H. E. I. writes: "A dwelling-house built chiefly of brick, and to be covered with cement roughcast, has just been roofed and tiled. The mortar in the joints of all the common brickwork is not setting properly; in fact, the blade of a penknife or a sharp instrument can be pushed into almost any joint without hammering. (*a*) Can you give the cause of this? The proportions specified for mortar are 3 to 1. The lime appeared all right; the sand was got from a quarry, is practically crushed sandstone, but fairly sharp, and is commonly used in the district. (*b*) How can the mortar be tested now to see that the proportions are approximately accurate? Is not hydrochloric acid a solvent of lime? If treated with this, could the residue be taken as the sand, and weights compared before and after? Details of this or any better test will be acceptable, provided same can be carried out without exceptional apparatus. (*c*) What is the best course to adopt with the building in case it proves unsatisfactory?"

—(*a*) There are many reasons why mortar does not set, the chief being (1) unsuitable materials, (2) wrong proportions, (3) imperfect mixing, (4) climatic conditions, (5) faulty use, and (6) the bricks. The material appears to be satisfactory and need not, at the moment, be further considered. The remaining causes are less easy to ascertain in mortar which has been used, though a chemical analysis will show if the proportions of the sand and lime are correct, and a series of such analyses will show whether they have been badly mixed. A microscopic examination will also show the regularity or otherwise of the mixing. Under "climatic conditions" are such causes as frost, rain on the mortar, etc., and it is almost impossible to state whether these have influenced the setting in this particular case. This would be a matter for evidence of persons present at the erection of the building. "Faulty use" of the mortar is a frequent cause of defective setting, particularly if more mortar has been made than is required. If mortar begins to stiffen, it should not be used, but it is so easy to throw it back into the mill and to mix it up with a little fresh lime, that much defective work may be traceable to this. To some extent this may be ascertained by an analysis of the mortar, as it would probably contain an excess of lime. Other faults in use may be ascertained by an examination of the building, and a prior argument may be based on the indications thus found, though such argument is not absolutely conclusive. Defective bricks, especially if they are too porous or have been insufficiently soaked before use, will withdraw the water from the mortar so rapidly as to prevent its setting, and make it into an inert mass. The probability or otherwise of the bricks requiring special treatment can be ascertained from an examination of the bricks used, but expert knowledge is required for this purpose.

(*b*) The testing of the mortar to ascertain the proportion of lime present requires special training. It is not sufficient to treat the mortar with acid as suggested, because in setting some of the lime and some of the sand combine together, and the compounds so formed would vitiate the result. It would be far more satisfactory in every way to have an analysis made by a competent specialist, and would not be very expensive.

(*c*) There is no entirely satisfactory procedure possible, but the least costly course will be to scrape out as much of the defective mortar as possible, and to point it with a cement-mortar, composed of one part of cement to three parts of sand. If this is done on both sides of the walling, and one side is then "roughcast," it will probably be strong enough for all but very exposed positions. But before giving a definite opinion on this point, it is desirable to see the building and to inspect the mortar *in situ*.

WHY A "ROD" OF BRICKWORK?

The question has been raised, "Why is brickwork measured by the rod of 16½ ft. in length by 16½ ft. in height by 1⅛ ft. in thickness? and is the rod a land measure adapted to brickwork, or is it a brick measure applied to land?

To arrive at a solution of this interesting problem it is necessary to bear in mind that in England walls were not built of brickwork before the Tudor period; and bricks did not come into general use for ordinary houses until a somewhat later time than this. Considering that the rod appears to have been the accepted measurement of brickwork from an early period after its introduction, to determine the origin of the measure it is necessary to go still further back, and examine the method of measuring buildings before the days of brickwork.

Records of leases and sales of buildings during the Middle Ages constantly take the "bay" as the unit of measurement. Shakespeare is merely mentioning a customary standard when he says in "Measure for Measure," Act II., Scene 1: "I'll rent the fairest house in it after three pence a bay."

This unit arose from primitive timber construction, which, becoming traditional, was followed for a long time in the erection of unpretentious buildings. For all such ordinary buildings timber was the material in common use, and was generally adopted for the framing, even when other materials were employed for filling in. Such early framing consisted of "forks," corresponding to the principals of a modern roof; each was composed of two tree trunks, often bent; one end of each was bedded in the ground and the two trunks were joined together at the top. They accordingly bear a slight resemblance to a Gothic arch. A tie beam was inserted at a convenient height to hold the bent timbers together. The "forks" were connected at the apex by a ridge, and wind braces were generally added. A building with two "forks" would be spoken of as consisting of one "bay." Larger houses would have two or more "bays," with, perhaps, outbuildings attached.

A unit of measurement such as the "bay" would lead to great confusion unless there was at least an approximate standard of length for the "bays," but if such were the case it would be a reasonable and ready means of denoting the size of a building. Upon examination of many of the smaller houses, farms and barns constructed with "forks," it is found that the usual width of the "bay" is 16 ft. or thereabout.

More definite evidence of the application of the rod or perch, as a measurement for buildings, is furnished by the Domesday of St. Paul's, in which we read: "The great barn of Walton was 10½ perches in length (a perch being 16 ft.) and 3 perches and 5 ft. in breadth."

In the dimensions of the larger secular buildings, where exigencies of site or other considerations did not interfere, a multiple of 16 ft. or 16½ ft. is very commonly found, such, for example, as the old Guesten Hall, Worcester, which is 65 feet 8 inches long, with a roof of 8 bays; or the Hall of Penshurst Place, 64 ft. long with a roof of 4 bays.

As the rod was thus a standard of measurement for the general dimensions of the domestic buildings of the Middle Ages, it is not unnatural that it should be retained in computing the quantity of brickwork, when that material came into vogue for walling.

It might be urged, however, that stonework is measured by the cubic foot and not by the rod. Upon a slight consideration, the answer to this objection will be apparent, for in stonework a superficial measurement of standard thickness would introduce difficulties in calculation, where walls may be of various thicknesses, which are not multiples of a given unit, such as that provided by the breadth of a brick for brick walls of all thicknesses. Superficial measurements are more readily dealt with than cubic ones, and as brickwork of varying thicknesses can be easily reduced to a standard thickness of 1½ bricks, the reason for the retention of the rod for brickwork, but not for stonework, is clear.

To ascertain whether the rod was a land dimension applied to buildings, or a building dimension applied to land, it will be necessary to discover the method of measuring land in times gone by.

In 1592 a book was published entitled: "The Moste Profitable and Commendable Science of Surveying of Lands, Tenements, and Hereditaments: drawen and collected by the industrie of Valentin Ligh," which contains the following table:

"The partes or divisions of an acre, with the denominations of the same, according to the Statute here mentioned.

"Three Barlie cornes faire and rounde, taken out of the middell of the Eare maketh an Inche.

"Twelve Inches make a Foote.

"Three foote make a Yarde.

"Five Yardes and a halfe maketh a Perche, which in some countries men cal a Pole or Rode, a Perche.

"Foure Perches make a Day-woorke.

"Tenne daye woorkes or XI Perches maketh a Rode or Quarter of an Acre.

"Fourscore Perches or two Roodes maketh halfe an Acre.

"A hundred and IX Perches or foure Roodes make an Acre.

"And fortie Perches in length and foure in breadth is an Acre."

The combination of lineal and superficial measures in the same table, to say the least, is somewhat confusing. The daywork mentioned, though obsolete in name, still exists in the chain of 4 perches or 66 feet. The author continues with some practical hints to surveyors. He adds: "To aunswere by Rodde or by Lyne, it is at your pleasure, but of them both the Line is the speedier, and also of moste antiquitye.

"Your Line being foure perches of length, and at everye Perche ende a knot, would bee well scarred with hotte Wax or Rosen, to avoide stretching thereof in the wete, and shrinking in the draught."

Passing now to early times, in the Domesday Book there are too systems of measurement applied to land. The first, by the "Hide" and by the "Carucate," it would appear, was obsolete at the time of the compilation of the record, but was probably the result of an earlier survey of the times of Ethelred the Unready, for the assessment of the "Danegeld" tax, and was corrected and incorporated in the later survey.

The second system was that in vogue after the Norman Conquest, and is the basis of our present method of land measurement, though certain modifications were introduced before the system was sanctioned by the statute of Edward I. Most of the dimensions are lineal and not superficial. The following table gives the measurements of length:—

3 feet equal 1 yard.
5½ yards equal 1 virga or pertica.*
4 perticæ equal 1 acra.
10 acræ equal 1 quarentina.
12 quarentinæ equal 1 Leuna, Leuga, or Leuca.

The lineal acre has since become obsolete. The quarentina of 40 perches corresponds with our furlong (*i.e.*, forty long).

The present league of 3 miles is just twice the old lenga of 1½ miles.

The superficial measures ran thus:—

30¼ yards equal 1 pertica.
160 perticæ equal 1 acra.
10 acræ equal 1 quarentina.
12 quarentiæ equal 1 leuga.

From this table it will be observed that the superficial acre did not consist of one lineal acre square, but of an oblong area, whose sides are 1 lineal acre and 10 lineal acres. It appears, moreover, that many plots of ground of the extent of one acre in area were set out with a width of 4 perches and a length of 40 perches. This agrees with the apparently irrelevant statement of Valentin Ligh quoted above, "and fortie perches in length and foure in breadth is an acre."

Returning to the Saxon basis of calculation—the "Hide" and the "Carucate." These terms did not denote an exact area of land, but only gave an approximate idea for the purpose of assessment. The word "Hide" signifies a homestead, and included the land belonging to the homestead, as well as the homestead itself. The term "Carucate" comes from the "Caruca," or ox plough team; a carucate was the land for the working of which one ox team would be sufficient. The full ox team consisted of eight oxen, and similarly the carucate was divided into eight divisions called "bovates."

The measurement of land, upon the basis of the ploughing of the oxen, gives a suggestion as to the probable origin of the perch or rod of 16 or 16½ feet. This dimension is that required by four oxen working or standing side by side. The full team consisted of eight oxen, but the usual working team was composed of four oxen. What more natural method for measuring land could there be than that of calculating it by the widths of 16ft. required for its working by the oxen? This would account for the setting out of an acre, as previously mentioned, of a width of 4 perches and a length of 40 perches.

If the perch had its origin as a land measure, from the width required by a team of four oxen, there remains for consideration the reason for its application to buildings. The primitive farmhouse generally consisted of a common living and sleeping room (such as would be termed the "hall" in larger houses), with a private chamber at one end; at the other end, and under the same roof was the oxhouse and stable. Horses, in those days, were used chiefly for riding and as pack horses. As the four oxen worked side by side during the day, so they would rest side by side at night, in the same stall, and consequently they would require the same space of about 16 feet. Most authorities, from Vitruvius to the present time, agree that this width is necessary for four oxen. This unit, having once been adopted for the oxhouse, would become the unit for the remainder of the house, and, considering the acknowledged conservatism and traditionalism which characterised the builders of the time, it would readily be applied to other buildings, in which the actual necessity for this particular dimension did not exist.

Federation News.

WAKEFIELD AND DISTRICT ASSOCIATION.

Secretary: J. Beaumont.

The annual meeting of the members of Wakefield and District Association was held at the Great Bull Hotel, Wakefield, on December 2nd. Mr. Tom Lee, the retiring president, took the chair at the commencement of the meeting, and proposed the election of Alderman Judge as president for the ensuing year. The proposition having been unanimously carried, Mr. Lee, in vacating the chair in favour of Alderman Judge, extended a hearty welcome to the new president.

Alderman Judge, in returning thanks for his election, addressed the meeting on the work of the association.

The president then proposed Messrs. E. A. Elvey, H. Fallas, T. Lee, and G. Crook as vice-presidents, and on being seconded by Mr. J. W. Bramham, the resolution was carried.

The following members were elected on the general committee, viz.: Bricklayers and masons, Messrs. R. L. Leake, J. Pashley, D. F. Parker, J. W. Bramham, and G. Clements. Joiners, Messrs. W. J. Atkinson, H. Blackburn, J. Lazenby, J. H. Broadhead. Plasterers, Messrs. J. W. Sanderson, and T. E. Senior. Plumbers, Messrs. W. H. Moss and H. Gillott.

The retiring president (Mr. T. Lee), and Mr. H. Fallas, were elected as the representatives of the association, on the Yorkshire Federation Council, on the motion of Mr. J. W. Bramham, seconded by Mr. Elvey, and the secretary, (Mr. J. Beaumont) was re-elected on the proposition of the president, seconded by G. W. Elvey.

The annual accounts were submitted by the secretary, duly audited by Mr. Lee, and Mr. Gillott, and were adopted.

EDINBURGH, LEITH, AND DISTRICT BUILDING TRADES ASSOCIATION.

Secretary: James Cameron.

The monthly meeting of the executive of Edinburgh, Leith, and District Association was held in the Building Trades Exchange, 61, Lothian Road, Edinburgh, November 25th. There was a good attendance, presided over by Mr. James Millar, in the absence of the chairman, Mr. Mekie, who was ill.

A letter was read from the secretary of the National Federation, as to conditions under which tenders are sent in, and several concrete cases were given by the members present of what they considered unreasonable demands made in certain conditions of contract. The secretary was instructed to supply the National secretary with the information regarding these cases, in view of the meeting to be held with the president and officers of the Royal Institute of British Architects on December 13th.

With regard to the German-made schools being erected in Leith, the secretary gave a report of the protest meeting recently held. It was agreed to make an examination of the work and report, and five gentlemen were appointed for the purpose.

Under this heading the secretary referred to the publicity given to the question of the

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*"Pertica" is the origin of our word "perch," and signifies a wooden rod or pole. It was used for example for the perch for hawks in old houses.

German-made schools in the "Builders' Journal," and urged the members to become subscribers. It was agreed to bring the claims of the journal under the notice of the members at the annual meeting, and the secretary was instructed accordingly.

NORTH SHIELDS, WHITLEY AND DISTRICT.

Secretary: John R. Hadaway, C.A.

The annual meeting of the North Shields Whitley, and District Master Builders' Association was held on November 30th at the association's offices, Howard Street, North Shields, when Mr. Joseph Pelton presided over a representative attendance of members. The secretary (Mr. John R. Hadaway, C.A.) presented the annual statement of accounts, which were considered highly satisfactory.

The President congratulated the members upon the state of the association's finances, and was pleased to say that the relations between the building trade employers and employees continued to be of a pacific character. In spite of the depression in trade during the past year no reduction had been made in the wages of the operatives.

The election of officers for the ensuing year resulted as follows:—President, Mr. John T. Scott; vice-presidents, Messrs. W. S. Shepherd and Joseph F. Newbold; treasurer, Mr. J. G. Fell; auditor, Mr. Gilbert Park; representatives of the Northern Counties Federation of Building Trades Employers, Messrs. John T. Scott, Joseph Pelton, and Joseph F. Newbold; representatives to the Tyne and Blyth Federation of Building Trades Employers, Messrs. W. S. Shepherd and J. G. Fell.

Tyne and Blyth District Federation.

The annual dinner of the Tyne and Blyth District Building Trades Federation was held at the County Hotel, Newcastle, on December 7th. The President of the Federation (Mr. W. T. Weir, of Howden) was in the chair, and he was supported by a large company, including Coun. J. T. Armstrong (South Shields), vice-president; the Sheriff (Mr. W. R. Armstrong), Coun. Johnstone Wallace, Deputy Lord Mayor of Newcastle; Coun. W. Foster (Pelaw), president of Newcastle Association; Mr. A. G. White (London), secretary of the National Federation of Building Trade Employers of Great Britain and Ireland; Mr. Joseph Duffy, Mayor of Wallsend; Coun. Stephen Easten; Mr. John T. Scott, President of the North Shields Association; Mr. G. T. Brown, of Sunderland, President of the Northern Architectural Association, etc., etc.

After the toast of "The King," Councillor J. T. Armstrong gave "The National Federation of Building Trade Employers." He said there was no trade with greater need of organisation than the building trade. They had to face strong competition, and they carried with them very great risks, but their National Federation was doing much to break down the risks that were imposed upon them. The aims and objects of the National Federation were not entirely of a selfish nature. The Federation did much work in connection with Parliamentary Committees, and the meeting of deputations, and if the outcome of this work was successful, he ventured to say that in seven cases out of ten it was the proprietor and owner of works that benefited rather than the actual builder.

Mr. J. W. White, a vice-president of the National Federation, responded. He said that all the builders wanted was a perfectly fair agreement to both sides to a contract. He was glad to say that in this district they had made considerable progress. There had been some tilting against the Conciliation Board, but the great thing to remember was that this Board, promoted by the Federation, held the field. During the last four years there had been no strikes throughout the country in the trades connected with the Federation. He went on to say that they were having too much legislation, too much Parliamentary interference. They had had new rules recently in respect of scaffolding, and the arrangements for building; this year they had had Labour Exchanges; next year they were to have insurance against unemployment; and when they coupled with that the Board of Trade returns, Workmen's Compensation Act, the Factory Acts, and so forth, they would wonder whether in their offices they were really builders or lawyers. He doubted whether the Labour Exchanges would justify their expense, but the builders would give them an honest trial. As to insurance against unemployment, he thought this question might be better combined with the Compensation Act.

Mr. A. G. White (secretary of the National Federation) gave "The Tyne and Blyth District Building Trades Federation." He said their organisation and other similar organisations had resulted from defensive needs. Like the workmen, they were relying on moral force. It was true, he said, that they had conditions of contract which were in the main satisfactory, but incidental to the obtaining of tenders there were a number of conditions which were imposed on tenderers which were anything but satisfactory, and he hoped a movement which had begun in the shape of a conference arranged between the professional bodies would ultimately result in a very much-needed reform in this direction. It was simply outrageous some of the things that were put forward. In proposing the toast of the "Tyne and Blyth District Building Trades Federation," he said that he was peculiarly interested in that District Federation, which embraced towns where the local conditions were analogous. It was much better that they should co-operate for their own benefit, than that they should indulge in any kind of rivalry. The best way to avoid trouble was to organise to meet it. It was the great Napoleon who said that in dealing with an adversary the moral effect that one was able to produce upon him compared with the physical effect as three to one. He took it that it was chiefly the moral effect that they relied upon to secure them the things they had in view. (Hear, hear.) He was sorry to say that his excellent chief, Mr. Brown, the president of the National Federation, was unable to be with them that night, but he sent them his best wishes for their success and a speedy return to better conditions.

The toast was responded to by the various local presidents. The Chairman (Mr. Weir) said they had been passing through very depressed times, but he thought there were indications all round of better trade. Probably they were themselves to blame for the ill-effects resulting from depression, as they had so cut up business that very little profit had accrued. With their better organisation he hoped they would have more sense, and see that they got a fair return for their work. He trusted also that all the builders in the district would join their Federation. It was hardly fair that builders, and even quantity surveyors and architects, should benefit from the organisation of others.

Coun. W. Foster (Pelaw) also responded. Times doubtless had been depressed, but they would have been much worse if the coal trade had not been prosperous, and it was on account of that that he hoped there would be no trouble about introducing the Eight Hours Act.—The toast was further spoken to by Coun. J. T. Armstrong, Mr. John T. Scott (North Shields), and Mr. J. Simpson (Blyth).

Coun. S. Easten proposed "The Architects, Engineers, and Surveyors," He said the position of builder and architect was peculiar, but he was willing to admit that the large majority of architects, whilst understanding their power under the contract forms, wielded that power very fairly. A the same time, he thought it was unfair tha where disputes occurred between two parties the question at issue should be referred to a third and interested party.

Mr. G. T. Brown, F.R.I.B.A., responded As a class, he said, architects realised tha they were part of the building trade itself They were all, builders and architects, absolutely interdependent upon each other. H trusted that the deliberations in progres with regard to sub-contracting and separat trades would result in a satisfactory arrangement. Under the present form of Institut contract the architects' powers had been considerably curtailed, and there was now n reason for any contractor to assume that h was not, under this contract, going to ge fair treatment. He would suggest that thei Federation should acquaint their member with the effect of the various general conditions under the existing contract which applied almost generally in the North of England.

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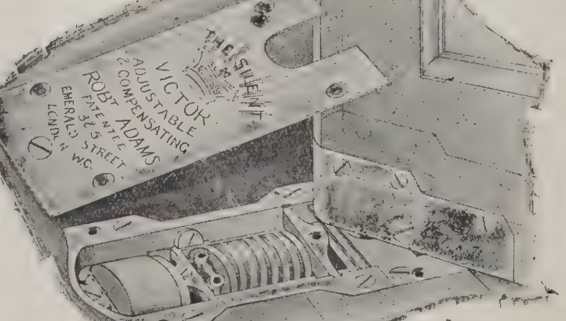

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Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, **BUILDERS' JOURNAL**, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bentley (Doncaster).—For erection of a cottage at Bentley sewage works, for the Doncaster Rural District Council. Mr. P. N. Brundell, architect, 1, Prince's Street, Doncaster.

Sprakes and Son, Doncaster	£400	0	0
W. G. Swann, Doncaster	388	0	0
Beastall and Sons, Doncaster	385	0	0
Smith and Fritchley, Bentley	332	9	0
G. Booth, Norton	310	0	0
Flowitt and Gilbert,* Balby	309	10	0

*Accepted.

Buxted (Sussex).—Accepted for alterations and additions to Buxted Park, for the Hon. H. B. Portman. Mr. F. W. Foster, architect, 26, Bedford Row, W.C.:—

A. Chilton, Uckfield, £928.

Chatham.—For erection of a corn-grinding building at the workhouse, Chatham, for the Guardians of the Medway Union. Mr. E. J. Hammond, architect, Balmoral Road, Gillingham.

A. Osborne, 65, Clive Road	£550	0	0
W. W. Hammond, 38, Kingswood Road, Gillingham	480	10	6
H. A. Phillips, 158, Glencoe Road, Chatham	440	10	0
A. H. Horne, Rainham, Kent	403	11	9
C. E. Skinner, Railway Street, Chatham	392	0	0
G. Baker and Son, Pelican Wharf, High Street, Strood	389	0	0
E. W. Filley, Gundulph Road, Chatham	371	0	0
H. E. Phillips, Livingstone Road, Gillingham	369	0	0
A. G. Webb, 13, Gordon Terrace	360	0	0
West Bros., High Street	356	0	0
G. Gates and Son, Frindsbury	355	0	0
F. J. Leonard,* 102, High Street	340	0	0
H. R. Richardson, 208, Napier Road, Gillingham	320	0	0

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Harrogate.—For erection of an infants' school at New Park, Bilton, Harrogate, for the Harrogate Education Committee. Mr. F. Bagshaw, borough engineer. Accepted tenders:—

C. A. Nettleton, Harrogate mason	£2,175	15	3
J. Atkinson and Son, Ltd., Whitehall Road, Leeds, slaters	160	0	0
G. H. Carrick, Harrogate, joiners	810	0	0
R. Fortune, Harrogate, plasterers	148	16	6
C. Allen, Harrogate, plumber and glazier	222	9	0
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R. C. Brebner and Co., Edinburgh	44,948	5	2
W. Manders, Leyton	44,266	2	8
J. Mowlem and Co., Ltd., Westminster, S.W.	41,046	19	7
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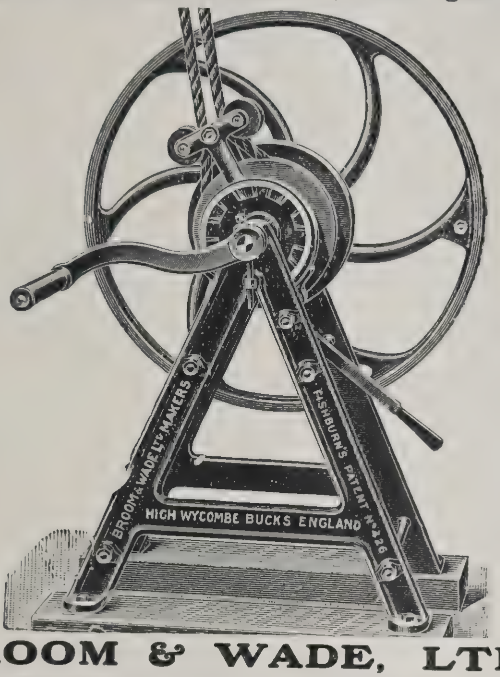

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S. G. Smith, South Place, E.C.	5,870	0	9
British Insulated and Helsby Cables, Ltd.,* Prescot ...	5,760	1	4

Estimate of chief officer of tramways, £6,900.
*Recommended for acceptance.

London, W.—For additions and alterations to 15, Mansfield Street, W., for the Countess Pappenheim. Mr. F. W. Foster, architect, 26, Bedford Row, W.C.

Foxley and Co.	£1,416
J. Kirkby	1,286

London, W.—For additions and alterations to 36, Belgrave Square, S.W. Mr. F. W. Foster, architect, 26, Bedford Row, W.C. Quantities by Mr. L. H. G. Stanbrough, 26, Bedford Row.

Prestige and Co.	£5,693
Whitty Bros.	5,620
F. G. Minter	5,532
Foxley and Co.	5,404
Allen and Co.*	4,978

*Accepted.

London, W.—For additions and alterations to 16, Grosvenor Street, W., for the Hon. Mrs. George Keppel. Mr. F. W. Foster, architect, 26, Bedford Row, W.C. Quantities by Mr. L. H. G. Stanbrough, 26, Bedford Row.

H. Hanks	£8,790
Perry and Co.	8,233
Prestige and Co.	8,150
Allen and Co.	7,750
F. G. Minter	7,278
J. C. Carmichael	7,195

Llandyssul.—For the erection of residence near Llandyssul, for Mr. L. T. Thomas. Haulage, stone, sand, and part slates found by owner. Mr. W. D. Jenkins, F.S.I., A.R.I.B.A., M.S.A., M.R.San.I., etc., architect, George Street, Llandilo, S. Wales.

	£	s.	d.
J. Davies, Ffostrassol	£670	0	0
J. Thomas, Llanpumpsaint ...	623	0	0
T. Jones, Llangranog*	605	0	0

*Accepted.

Nutley (Sussex).—Accepted for additions to Old Lodge, Nutley. Mr. F. W. Foster, 26, Bedford Row, W.C., architect.
W. Gadley, £3,200.

Ramsey (Hunts).—For erection of a Council school, Mereside, for the Hunts. Education Committee. Mr. Herbert Leete, county surveyor, Huntingdon. Quantities by county surveyor.

	£	s.	d.
J. Cracknell	£2,198	0	0
Hawkins and Son	2,040	0	0
W. Alcock	1,983	10	0
J. Saint and Sons	1,897	16	0
J. Bridgefoot and Son ...	1,890	0	0
G. Page and Son	1,880	0	0
J. Allen and Sons	1,860	0	0
F. B. Thackeray and Co., Ltd.	1,828	10	0
F. Giddings	1,786	0	0
Rose and Sons	1,776	13	9
D. Gray	1,755	0	0
R. Shanks	1,730	0	0
J. Guttridge and Sons,* Peterborough	1,719	0	0

*Accepted

Shepherd's Bush, W.—Accepted for the erection of a block of shops in Uxbridge Road, Shepherd's Bush, W. Mr. F. H. Witts, M.S.A., architect and surveyor, 39, Agate Road, Hammersmith, W.:—
T. H. Kingerlee and Sons, Queen Street, Oxford, £6,590.

Sopworth (Wilts).—For additions and alterations to the Rectory, for Captain the Hon. Cyril Ward. Mr. F. W. Foster, architect, 26, Bedford Row, W. C. Quantities by Mr. L. H. G. Stanbrough, 26, Bedford Row, W.C.

Allen and Co.	£8,217
C. Trask and Sons	7,998
Foxley and Co.	7,984
J. Freeman	7,350
Orchard and Peer	7,290

Tipton (Staffs).—For erection of a caretaker's house and outbuildings on land adjoining the public offices, Tipton, for the Urban District Council. Mr. W. H. Jukes, M.E., engineer and surveyor.

	£	s.	d.
F. L. Jones, Wolverhampton	£296	0	0
W. A. Kendrick, Tipton ...	245	0	0
J. Sisman, Tipton	235	0	0
H. Smart, Netherton	235	0	0
A. J. Crump, Dudley	225	0	0
J. Edwards,* Oxford Street, Dudley	219	10	0

Surveyor's estimate, £224 10s. 7d.
*Recommended for acceptance.

Tunbridge Wells.—For the erection of St. Luke's Church, Wilkin Road, Tunbridge Wells. Mr. Egbert Cronk, architect:—

J. Crates and Son, Tunbridge Wells...	£5,915
J. Smith and Sons, Norwood ...	5,768
G. and F. Penn, Pembury	5,741
Davis and Leaney, Goudhurst ...	5,700
J. Longley and Co., Crawley	5,689
Bowman and Sons, Stamford ...	5,595
Goodwin Bros., Tunbridge Wells ...	5,563
R. A. Lowe and Co., Chislehurst ...	5,548
Martin and Co., Tonbridge	5,495
G. E. Wallis and Sons, Maidstone...	5,494
A. S. Ingleton, Herne Bay	5,420
J. Jarvis, Tunbridge Wells	5,400
Peerless, Dennis, and Co., Eastbourne	5,337
Strange and Sons, Ltd.,* Tunbridge Wells	5,251

Urmston (Lancs).—For street flagging works, for the Urmston Urban District Council. Mr. J. Heath, surveyor.

	£	s.	d.
W. Clark, Manchester	£528	15	6
P. D. Hayes and Sons, Heaton Norris	494	6	6
W. H. Worthington, Ltd., Manchester	458	17	4
M. Naylor, Manchester	456	18	8
W. Snape and Sons,* Eccles ...	425	12	4

*Accepted.

TO CONTRIBUTORS.

Owing to the very large number of voluntary contributions submitted to the Editor, it has been found desirable to make the following regulations:—

1.—Intending contributors are advised to send a preliminary letter before forwarding articles and illustrations. The non-receipt of a reply within one week is to be taken as a polite negative. MSS. and drawings in all cases should be accompanied by sufficient stamps to cover return postage.

2.—The Editor declines to take any responsibility for the safety or return of contributions submitted, although every care will be taken where these regulations are complied with.

3.—Each MS. and illustration should bear the name and address of the owner or sender.

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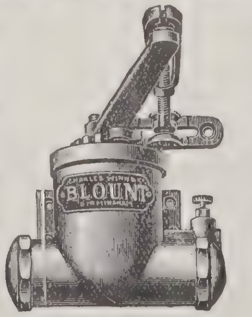

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Late Tenders.

Crosby.—For the erection of seven dwelling-houses Ir. W. H. Buttrick, architect, Scunthorpe.

Buckley	£1,652	0	0
Buttrick	1,535	0	0
Robershaw	1,410	0	0
Quibell	1,399	10	0
Thompson	1,386	0	0
Hollingsworth, Scunthorpe*	1,384	0	0
Smith Bros.	1,365	0	0
Burnett	1,339	10	0

*Accepted.

London.—For the extension of the chief station f the fire brigade for the London County Council

Leslie and Co., Ltd.	£18,059	0	0
W. Johnson and Co., Ltd.	17,990	0	0
Higgs and Hill, Ltd.	17,934	0	0
Foster and Dicksee	17,777	0	0
Holland and Hannen	17,500	0	0
G. Trollope and Sons, and Colls and Sons, Ltd.	17,484	0	0
Holloway Bros. (London), Ltd.	17,290	0	0
J. Mowlem and Co., Ltd.	17,150	0	0
H. L. Holloway	17,067	0	0
J. Carmichael	17,047	0	0
Kirk and Randall	16,866	0	0
Kerridge and Shaw, 28, Sturton Street, Cambridge	16,861	0	0

Architect's revised estimate, £17,550.

*Accepted.

London.—For the construction of the Thames tunel, North and South Woolwich for the London ounty Council.

Perry and Co., Ltd.	£122,527	0	0
S. Pearson and Son., Ltd.	104,856	14	8
Griffiths and Co., Ltd.	96,541	1	0
W. Muirhead and Co.	92,743	10	6
Price and Reeves	92,600	0	0
J. Cochrane and Sons	91,032	2	1
Whyte and Co., Ltd.	85,135	19	6
J. Mowlem and Co., Ltd.	80,506	0	0
W. Scott and Middleton, Ltd.,* 28, Victoria Street, S.W.	78,860	7	1

Chief Engineer's estimate, £101,236.

*Recommended for acceptance.

London.—For roadwork and platelaying, Woolvich to Eltham tramways, for the London County ouncil:—

G. P. Trentham	£42,455	3	0
D. T. Jackson	40,196	16	11
W. Griffiths and Co., Ltd.	40,190	11	1
W. Manders	40,040	10	10
Kirk and Randall	38,331	0	0
R. C. Brebner and Co.	37,332	1	6
J. Mowlem and Co., Ltd.	36,725	0	0
R. W. Blackwell and Co., Ltd.	36,662	16	9
Dick, Kerr and Co., Ltd.	33,226	1	6
A. Stark and Sons,* Glasgow	32,528	4	6

Chief Engineer's estimate, £35,470.

*Recommended for acceptance.

London.—For providing and fixing two boilers and low-pressure hot-water heating apparatus and for the necessary builder's work, Marner Street School, Bow and Bromley, for the London County Council:—

J. Grundy	£897	0	0
J. Wontner-Smith, Gray, and Co.	892	5	0
Pemberton, Arber, and Carey	885	10	0
Stevens and Sons	868	0	0
Brightside Foundry and Engineering Co., Ltd.	821	0	0
A. Macintosh and Sons, Ltd	819	0	0
J. Yetton and Co., Ltd.	813	0	0
Tilley Bros.	786	1	6
W. G. Cannon and Sons, Ltd	745	0	0
J. C. Christie	740	0	0
G. and E. Bradley,* 77, Lever Street, E.C.	723	10	0

Estimate of the Architect (Education), £777.

*Accepted.

London.—For the erection of a higher school, with 500 places, in Sherington Road, Greenwich, for the London Education Committee:—

G. Parker and Sons, Sumner Road, Peckham	£15,630
W. Downs, Hampton Street, Walworth	14,655
Treasure and Son, Ltd., Cottenham Road, Holloway	14,649
F. and T. Thorne, Isle of Dogs	14,343
J. Marsland and Sons, York Street, Walworth	14,319
H. L. Holloway, Church Street, Deptford	14,282
Perry and Co. (Bow), Ltd., Tredegar Works, Bow	14,275
W, Akers and Co., Ltd., High Street, South Norwood	14,228
F. and H. F. Higgs, Hinton Road, Herne Hill	14,219
T. D. Leng, Evelyn Street, Deptford	14,150
J. and C. Bowyer, Ltd., Upper Norwood	14,096
Kirk and Randall, Woolwich	13,985
Thomas and Edge, Anglesea Avenue, Woolwich	13,896
J. Smith and Sons (Norwood), Ltd., South Norwood	13,853
W. Johnson and Co., Ltd.,* Wandsworth Common	13,212

Estimate of the architect (Education), £14,456.

*Recommended for acceptance.

London, E.C.—Accepted (under jobbing schedule) for extending the appliance-room, repairing the appliance-room floor, providing sliding poles, and executing alterations to the hose-hoist and the electric lighting arrangement at the Redcross Street fire-station, for the London County Council:—

Gladding and Co., about £1,080.

Macclesfield.—Accepted for the erection of a bakery, for the guardians. Messrs, Whittaker and Bradburn, architects, 19, King Edward Street, Macclesfield:—

Gorton and Wilson, Elizabeth Street, Macclesfield, £1,390.

Pinner (Middlesex).—Accepted for erection of two pairs of semi-detached houses in West End Avenue, Pinner. Mr. J. E. Henderson, architect:—

Milsom and Booth, £2,210.

BIRMINGHAM CLERK'S OF WORKS AND BUILDER'S FOREMAN'S ASSOCIATION.

By the courtesy of the Rev. Fathers, the members and friends of the above association were invited to inspect the now completed memorial church, erected to perpetuate the memory of the late Cardinal Newman. The party were conducted over the building by Mr. W. H. Francis, Clerk of Works, and greatly admired the design and workmanship of the church, which has been erected regardless of cost, and without a competitive tender, from the designs of Mr. Dorian Webb, of Salisbury.

The new structure was adapted from the church of Saint Martino di Monti, at Rome, the style being early classical, but instead of the flat roof of Saint Martino, the architect has introduced a barrel roof and dome of reinforced concrete. The great features of the building are the monolith marble columns, each about 17ft. 6ins. high, with a girth of 6ft. 8ins. In addition to these columns, each costing over £200, the marble panel work at the back of the Sanctuary, together with that of the choir gallery, is very beautiful and attracts great attention and admiration. At the conclusion of the inspection a vote of thanks was accorded to the Rev. Fathers of the Oratory, the architect, the builder—Mr. E. Linzey, of Trowbridge, and the Clerk of Works.

This form should be cut out and sent with remittance to: The Manager, "THE BUILDERS' JOURNAL"
Caxton House, Westminster.

"THE BUILDERS' JOURNAL"

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Box numbers will be allotted to advertisers free of charge, and replies addressed to a Box Number can be forwarded to the advertiser per post upon request. Postage of uch parcels will be charged but rolls or parcels of drawings in reply to advertisements are not accepted.

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The charge for Advertisements under this heading is 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ACCURATE QUANTITIES prepared by London Surveyor of experience, in shortest possible time; reasonable terms; provincial work undertaken; jobs measured and settled anywhere.—Surveyor, 34, Chambers Lane, Willesden, London, N.W. 'Phone, 553 P.O. Willesden. 5379

AN Architect's Assistant, 28; good draughtsman; varied experience; contract drawings, design, details, perspectives, etc.; excellent references; moderate salary.—Box 5405, BUILDERS' JOURNAL Office.

ARCHITECT'S and Surveyor's Assistant (25), 9 years' London experience; working drawings, designs, specifications, supervision, etc.; land surveying, and assist with quantities; prizeman and medallist; temporary or otherwise.—W., 20, Holmewood Road, Streatham Hill, S.W. 5400

ARCHITECT'S Assistant, Builder's Clerk or draughtsman, good colorist and typist, general office routine; excellent references; salary 21s.; commence at once.—Box 5414, BUILDERS' JOURNAL Office.

BUILDER'S or Estate Foreman seeks job; practical experience in all branches; good references from previous employers; abstainer. — Address, C. C., 9, Park View Crescent, New Southgate.

ARCHITECT'S Assistant, just completed 5 years' articles in good provincial office, seeks engagement to generally assist in architect's or builder's office; varied experience; moderate salary; excellent references.—Box 5430, BUILDERS' JOURNAL Office.

ARCHITECT and Surveyor's Assistant (26), 9 years' London and provincial experience; final R.I.B.A. honours, construction, design, surveying, quantities, etc.; salary two guineas per week.—Box 5429, BUILDERS JOURNAL Office.

ARCHITECT'S and Surveyor's Assistant (23), disengaged, 7 years' experience, including estate work, working drawings, details, perspectives, specifications, quantities; design prize winner; excellent testimonials; moderate salary.—E. S., 5, Belvedere Road, Sunderland. 5428

ARCHITECT'S Assistant (24), with excellent references, urgently asks appointment with architect, builder, or manufacturer. Travelling Studentship winner.—Please reply Box 5426, BUILDERS' JOURNAL Office.

ARCHITECT and Surveyor's junior Assistant; 5 years' experience, neat draughtsman, details, working drawings, assist with quantities, surveying, and levelling; excellent references; moderate salary.—Box No. 5420, BUILDERS' JOURNAL Office.

ARCHITECT'S and Surveyor's, or Builder's Assistant (21): neat draughtsman, tracer, and colourist, plans and details; good practical knowledge of construction; supervising; assist surveying and levelling; first-class freehand drawer; moderate salary.—F. J. Lester, 51, Redstone Road, Hornsey, N. 5416

BUILDER'S General Foreman (age 42); 12 years' references; quick and energetic with new or alterations; good timekeeper, and abstainer; carpenter. — S., 36, Ecclesbourne Road, Thornton Heath.

BUILDER'S Assistant seeks engagement; excellent draughtsman; 10 years' architectural experience; quantities, supervision, etc.; first-class references.—Box 5403, BUILDERS' JOURNAL Office.

BUILDER and Decorator or Estate Manager; sound practical knowledge of all branches; age 43; town or country; 7 years present position; good references. — W., 122, Winchester Road, Highams Park, Chingford.

BUILDER'S Assistant (22) desires situation in town or country; experienced, plans, specifications, quantities, measuring, accounts, outside supervision, setting-out, and ordering of materials.—F. B., 30, Carminia Road, Upper Tooting, S.W.

BUILDER'S Assistant desires engagement; practical estimator, quantities, measuring accounts, prime cost, book-keeping, drawing, outdoor supervision; highest references.—M., 97, Downs Park Road, Lower Clapton.

CLERK (21), Surveyor or Builder quantities, abstructing and billing, drawing, shorthand and typing, surveying (chain), and levelling.—Box 5427, BUILDERS' JOURNAL Office.

CONTRACTOR'S General or Working Foreman (expert carpenter), just finishing on public works, is open to engagement; new or alterations jobs; smart, capable manager; experienced in all trades and knowledge of concrete construction; abstainer.—Foreman, 9, Nightingale Grove, Lewisham, S.E.

CLERK of Works disengaged (practical); sound experience of schools and important buildings; age 40; steelwork, masonry, joinery, etc.; all duties; thoroughly established; keen and careful supervisor; many testimonials.—Box 5407, BUILDERS' JOURNAL Office.

ENGINEER desires position, contracting firm perferred; designs for ferro-concrete and steelwork; 10 years' varied experience; good organiser and estimator; salary 50s. — Box 5389, BUILDERS' JOURNAL Office.

ESTIMATOR, Quantity, and Measuring Clerk wants work; London experience; adjust variations, measure taskworkers, supervision, general routine; good references; moderate salary; permanent, or temporary if desired.—G., 2, Sandmere Road, Clapham, S.W.

FOREMAN of painters and decorators or Estate Foreman seeks re-engagement; town or country; smart and capable, and good manager; excellent references.—Address, Foreman, 92, Ashmore Road, Paddington.

GENERAL Foreman seeks re-engagement; town or country; experienced in all branches; carpenter by trade; energetic and reliable; keen on variations; first-class references; abstainer; age 40.—Foreman, 67, Stroud Green Road, Finsbury Park, N.

JUNIOR Assistant, good experience in domestic and chapel work, neat draughtsman and tracer; levelling and surveyor, perspectives; salary 25s.—Box 5412, BUILDERS' JOURNAL Office.

PAPERHANGING, etc., wanted, any quantity, best work at moderate prices; experienced in all latest productions, reliefs, fabrics, emdeca, etc.; best references.—Lane, 24, Faraday Road, North Kensington, London, W. 5421

PLUMBER, experienced, registered gas, hot water fitter, new, jobbing and sanitary work, and lead laying, desires permanency; excellent references.—F. C. H., 45, Newry Road, St. Margaret's-on-Thames. 5381

TYPEWRITING.—Architect's specifications and reports a speciality; sketches inserted; all work cheaply and promptly executed.—Address, "Typist," 2, Marsham Street, Westminster. 5402

WORKING Foreman of painters and decorators seeks job; good tradesman, colourist, and manager of men; total abstainer; good West-end references. —Geo. Steven, 29, Bravington Road, Harrow Road, W.

Appointments Vacant.

JUNIOR Clerk wanted for builder's and contractor's office. Age about 18. One with knowledge of builder's office preferred.—Write H. W. and Co., Ltd., 48, London Wall, E.C., stating experience and wages required.

FOREMAN Joiner wanted in large steel works, capable of managing about eighty men in shop and on buildings. Must be thoroughly experienced in use of wood-working machinery. None but good timekeepers, sober, and energetic men need apply. Permanent situation for suitable man.—Write, stating age, experience, wages required, and references to Vickers Sons and Maxim, Ltd., Sheffield.

ALFRED GOSLETT and Co., Ltd., have a vacancy for a traveller in the western suburbs of London. Must have a connection amongst builders, architects, etc., or a thorough knowledge of the trade. Liberal salary to a good man.—Write, stating qualifications, age, salary required, to Chairman, 127, Charing Cross Road, W.C.

BRICKWORK.—First-class man wanted to give price for brickwork, digging, and carcasing, labour only.—Apply Davis Bros., 65, Bishopsgate Street Without, E.C.

SOUTHGATE Urban District Council.—Building Inspector.—The Council require the services of a Building Inspector, at a commencing salary of £160 per annum. Applications, on forms to be obtained from the undersigned, stating age (not to exceed 42), qualifications, etc., with copies of not more than three recent testimonials, must reach me not later than January 4th next. Canvassing, directly or indirectly, will disqualify.—W. M. Ellenor, Clerk to the Council. Council Offices, Palmer's Green, London, N., December 22nd, 1909.

WORKING Manager required by Sanitary Engineers and Water Fittings Company; must be a thoroughly qualified registered plumber, used to preparing estimates for drainage, sanitary, and jobbing work, and capable of undertaking the management of a business; applications, with copies of testimonials, must state age, experience, and salary required.—Address, Fittings, care of Edmonds, Clover, and Ackery, Chartered Accountants, Portsmouth.

WORKING Foreman required for builder's shop; must have held similar position; used to taking off details, measuring up, machinery, piecework rates, and management of men; testimonials and particulars to Box 5432, BUILDERS' JOURNAL Office.

Contracts Open.

WAR DEPARTMENT CONTRACT.

The Secretary of State for War hereby invites Tenders for the following work:—The re-appropriation of A.S.C. Block and erection of additions to provide accommodation for the Royal Army Medical Corps Millbank, London, S.W.

Plans, specification and conditions of contrac may be inspected at the office of the Director o Barrack Construction, 80, Pall Mall, London S.W., on Monday, Tuesday, and Wednesday, January 3rd, 4th, and 5th.

Those desiring to Tender and to receive a copy o the bills of quantities must apply to the Director o Barrack Construction not later than Friday, Januar 7th, 1910. The application must be accompanied b a deposit of ten shillings, which will be returned if bona-fide Tender is received from the applicant Cheques or orders to be made payable to the Assistant Financial Secretary and crossed "Bank of England for credit to Army Funds."

Tenders, on the form supplied with the bills o quantities, must be delivered in sealed envelopes marked "Tender for Reappropriation of A.S.C Block, Millbank, S.W.," not later than twelve noo on Monday, January 17th, 1910, addressed to th Director of Army Contracts, War Office, Whitehall London, S.W. The bill of quantities should accompany Tender in a separate sealed envelope, similarl addressed and marked, "Bills of Quantities, Reappropriation of A.S.C. Block, Millbank, S.W.," wit the contractor's name and address thereon.

The Secretary of State does not bind himself t accept the lowest or any Tender.

(Signed) H. DELA BERE,
Director of Army Contracts.

War Office,
Whitehall, London, S.W.,
December, 1909.

TO BUILDERS.

The Commissioners of H.M. Works and Publi Buildings are prepared to receive TENDERS for [illegible] ERECTION of a new Post-Office at Malton.

Drawings, specifications, and a copy of the conditions and form of Contract may be seen on application to H.M. Office of Works, Infirmary Street Leeds.

Bills of Quantities and forms of Ter[illegible] may b obtained at the undermentioned ad[illegible] on payment of one guinea. The sums s[illegible]aid will b returned to those persons who sen[illegible]n Tenders i conformity with the condtions spe[illegible]d below.

The Commissioners do not bi[illegible] themselves t accept the lowest or any Tender

Tenders must be delivered bef[illegible]e Eleven a.m. o Wednesday, January 12th, 1910, addressed to th Secretary, H.M. Office of Works, etc., Storey Gate, London, S.W., and endorsed "Tender f "Malton New P.O."

H.M. Office of Works, etc.,
December 21st, 1909.

TO BUILDERS.

The Commissioners of H.M. Works and Publ Buildings are prepared to receive TENDERS for t Enlargement of the Halifax Post Office.

Drawings, specifications, and a copy of the co ditions and form of Contract may be seen on app cation to the Postmaster, Head Office, Halifax.

Bills of Quantities and forms of Tender may obtained at the undermentioned address on p ment of one guinea. The sums so paid will returned to those persons who send in Tender conformity with the conditions specified below.

The Commissioners do not bind themselves accept the lowest or any Tender.

Tenders must be delivered before Eleven a.m. Wednesday, January 12th, 1910, addressed to t Secretary, H.M. Office of Works, etc., Storey Gate, London, S.W., and endorsed "Tender f Halifax P.O. Enlargement."

H.M. Office of Works, etc.,
December 21st, 1909.

WORCESTERSHIRE EDUCATION COMMITTE

To Building Contractors.

TENDERS are invited for the erection of a n Council Elementary School, and for the Enlarg ment of Existing Schools, in Colley Lane, Cradle in the County of Worcester.

Applications for forms of tender and bills quantities may be made on or before Decemb 11th, 1909, at the County Education Office, Worce ter. Applications must be accompanied by a d posit of £2 2s. The amount of the deposit will returned after the Committee's decision provid that the contractor shall have sent in a bona-fi tender, and shall not have withdrawn the same.

The drawings may be seen on and after the sa date at the office of the Architects, Messrs. Pr chard and Pritchard, Bank Buildings, Kidderm ster.

Bills of quantities will be forwarded in due cours

The Education Committee do not bind themselv to accept the lowest or any tender, nor will t Committee pay any cost incurred in tendering.

Tenders must be delivered not later than Dece ber 31st, 1909, in sealed envelopes, addressed the Director of Education, 37, Foregate Stre Worcester, and endorsed "Tender for Council E mentary Schools, Colley Lane, Cradley."

A. WESTON PRIESTLEY,
Director of Education

County Education Offices, Worcester.
December 2nd, 1909.

December 31, 1909. Volume 30, No. 778.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

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THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

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TO ALL OUR READERS AT HOME AND ABROAD: A HAPPY AND PROSPEROUS NEW YEAR.

Foreword. It is with mingled pleasure and relief that we place before our readers this Special Issue of the "Builders' Journal," the production of which, as its mere bulk would suggest, has entailed a vast amount of labour and expense. If it meets with the same warmth and generosity of approval with which its predecessors were greeted in every direction, at home and abroad, we shall see of the fruits of our labour and be satisfied. Its commercial success is already beyond conjecture, the orders for it having exceeded our utmost anticipations; and we entertain no misgivings as to our readers' approval of its contents. For our part, we venture to believe that it is the best of the series; in which case we may perhaps be pardoned the pride and pleasure we feel in having not only sustained but increased the reputation already enjoyed by our firm for unrivalled courage and enterprise, by producing, for the third successive year, a volume of unique interest, and of unexampled quality and value.

1909. At the beginning of 1909 hope ran high that the general depression of trade, which had so long reacted with disastrous consequences on the profession and business of building was about to disappear; but, unfortunately, it must now be confessed that the net result of the twelvemonth's experience is the addition of yet one more to the already long list of lean years. Still, on the whole, the indications, rather than the material advantages, have been sufficiently encouraging to sustain heart and hope, and to foster the belief that matters are really mending, if with tedious slowness and almost imperceptibly. There can be no doubt that the tardiness of recovery in our own country is largely due to political unrest. Capital has been locked up, and enterprise has been daunted, by the creation of a new set of financial conditions, whereof the consequences are not easy to estimate, and by the uncertainty as to whether or not the country will accept them. Until the matter is definitely settled one way or the other, and the political atmosphere becomes clear enough to enable the capitalist to take his bearings, and shape his course, substantial improvement is impossible. The result of the next general election may or may not re-establish confidence. It may possibly be so indecisive as merely to postpone the event and prolong the agony of suspense. But to hope for the best is to help to ensure it.

Important Buildings. Naturally, a year that has been fraught with so much uncertainty and anxiety has not been very prolific of building operations. Nevertheless, the important buildings that have been finished or begun during the past twelvemonth make a tolerably respectable, if not an imposing, list, as the selection described and illustrated in the present issue will serve to suggest. The new University of Birmingham, which, designed by Sir Aston Webb and Mr. Edward Ingress Bell, was opened by the King on July 7th, may be said to represent an entirely new spirit in this class of building; the studies in the university being largely, if not chiefly, of a practical and technical character, and the elevation of the building revealing very frankly the purposes to which it is being put. It is illustrated in the present issue, as well as in that for July 7th. The completion of the Royal Victoria and Albert Museum, and its opening by the King on June 26th, were duly chronicled in our issue of June 30th, and an illustrated description of this notable building is given in the present issue. The completion of the Selfridge Store marked a new era in the style and structure of business buildings in London. The controversy as to the design for London County Council's new hall has not wholly subsided. In April it was stated by the Establishment Committee that the architect had come to the conclusion that "he can greatly improve the appearance of the centre portion of the river front," and his amended design received the approval of the assessors; but apparently no mere modification of the original design will satisfy the malcontents, whose opposition was vigorously renewed on this announcement. Early in the year it was decided that the proposed memorial to Shakespeare should take the form of a national theatre, which is to be built, on a site that is not yet chosen, at a cost of perhaps, £100,000.

R.I.B.A. Topics. The year will not be altogether undistinguished in the annals of the Royal Institute of British Architects. On May 17th and 24th, and June 7th, a special general meeting was held to consider the proposals of the Council for the revision of the by-laws under the new Supplemental Charter, the chief points in which were set forth in our issue of May 19th. The Supplemental Charter will broaden the basis and extend the influence of the R.I.B.A., by giving it power to admit within the fold all who possess the necessary qualifications. "It will empower us," said Mr. Ernest George, in his presidential address delivered on November 1st, and summarised in the "Builders' Journal" of November 3rd, "to open the gates of the Institute for the space of one year for the admission of the large number of practising architects of good standing who are still unattached to our body." Then, the Institute "representing practically the whole of the architectural profession in this country," Parliament is to be asked for larger powers. This, of course, means registration, of which, therefore, 1909 seems to have brought us almost within measurable distance. The question of registration no doubt had an influential bearing on the election of the new Council of the R.I.B.A., and the result of the election was flattering to the friends of the movement. The new Supplemental Charter received the Royal approval, and the reconstruction of the R.I.B.A. on a broader basis is apparently not far off. Under the new by-laws, it was decided to add two Associates to the Council (six instead of four), thus increasing the Council to forty-two.

The Architectural Association. The "Junior Institute"—the Architectural Association—is to become still more like its parent in one of its most agreeable features, the "At Homes," which have proved so successful with the senior body, and should afford a no less valuable means of intercourse between members of the Association who otherwise would have no easy means of meeting each other. The Association, which is perhaps mainly educative in its character, wisely lays stress on the social and recreative side; and the proposed formation of a golf club gives promise of a notable addition to the amenities. A slight falling off in the membership is regrettable, but was rather to be expected as a result of the business depression, which has been acutely felt among architects.

The Building Exhibition. Foremost among the events of the year was the Building Exhibition, which was held at Olympia from April 17th to May 1st, and was in many respects the most successful of the series. In a normal state of trade, the accruing business results would doubtless have been vastly better; but we understand that, in the circumstances, most of the exhibitors had no reason to feel dissatisfied. As Mr. Ernest George said, in the speech he made at the opening ceremony, "Such an exhibition as this teaches us a great deal, and it is our business to know what is going on in the building world. We find here examples of every material and appliance to help us in building, and those who pursue that most important art should be fully cognisant of all that is happening in connection with it." In furtherance of this object, we published, in our issues of April 21st and April 28th, the fullest and best account (copiously illustrated) that has ever appeared in connection with these exhibitions; and, in particular, the issue of April 21st is, as to both bulk and quality, probably without a parallel in periodical literature of the kind.

Thames Bridges.

The bridging of the Thames is still engaging a great deal of attention. The St. Paul's Bridge scheme has been put forward with a view to relieving the growing congestion of traffic, and would represent a fairly large experiment in sectional town planning; but that the whole subject involves architectural as well as engineering considerations will have to be kept steadily in view. An illustrated article by Mr. Robert Boyle, B.Sc., on "The Bridge Beautiful, and Otherwise," in our issue of August 25th, is of timely value The widening of Blackfriars Bridge was completed in September, and in our issue of September 22nd we were able to give an authoritative account of the work. The subway constructed as a part of the widening scheme was opened on November 29th.

Town Planning.

Town planning has naturally received a great deal of attention. Several important lectures, dealing with its various phases, have been delivered during the year, notably by Mr. H. V. Lanchester, Mr. Inigo Triggs, and Mr. Raymond Unwin; and the two last-named architects have each published an important book on town planning. There have been also several important conferences on the subject, but these have been necessarily tentative and indeterminate. The latest of them, however—that held at the Westminster Palace Hotel on December 14th and 15th—got as far as the nomination of an advisory committee. A Town Planning and Housing Exhibition was held at the Hampstead Garden Suburb from July 14th to August 7th, and Mr. Ernest George, Prof. Beresford Pite, Mr. Raymond Unwin, and Mr. S. D. Adshead were present at the opening ceremony. The visit of a large party of professional men, members of town councils, and others to Germany, to study the methods of town-planning in that country, was no doubt highly instructive, and must have a considerable bearing on the administration and interpretation of the new Act. It was described by two of the visitors in our issue of May 19th. In revenge, a party of 200 members of the German Garden City Association visited this country in July, and found that we have examples worth imitating. Another notable Garden Suburb enterprise is being developed at Winchmore Hill, near Enfield, where stress is to be laid on architectural design. The French, who have never been indifferent to town planning, have in hand a gigantic scheme for widening and extending the Boulevard Haussmann, and they are evidently growing restless under the accusation that Paris has, of recent years, made but little effort to sustain her reputation as one of the finest cities of the world. Rome also has its town-planning scheme, which, as first put forward, was of such a drastic character as to threaten the destruction of many venerated buildings. It has since been considerably modified.

Architectural Education.

The year has seen a considerable advance towards the reform of architectural education. To this subject the "Builders' Journal" has devoted constant and careful attention; and the attitude on the question which we have consistently maintained is that what is required is a system of training modelled on that of the Ecole des Beaux-Arts. To this view the new Council of the R.I.B.A. shows a decided inclination, and Mr. Ernest George's presidential address contained for us no more welcome announcement than that careful consideration was being given to a scheme for founding a British Architectural School of Rome. Recent modifications in the R.I.B.A. examinations have been fully dealt with in our issues of August 18th, September 22nd, and September 29th. Another educational idea that has assumed form and substance during the year is that in connection with the new Chair of Civic Design and Landscape Architecture, founded through the generosity of Mr. W. H. Lever, M.P., at Liverpool University, to which chair the Council of the University, at a meeting held on March 23rd, appointed Mr. Stanley Davenport Adshead, F.R.I.B.A., in whom Mr. C. H. Reilly, the Roscoe Professor of Architecture at the University, has a worthy coadjutor. During the year, Prof. Reilly visited the United States with the object of studying American methods. The character of the very practical educational work that is being done in Liverpool University was well shown by illustrations in our issue of August 4th; and an important and timely article on "The Ecole des Beaux-Arts, its teaching and its influence on American Architecture," by Paul Cret, was given in our issue of August 11th. An account of the new architectural day school at the Birmingham Municipal School of Art appears in the same issue.

Competitions.

Competitions have been this year less remarkable for their number than for the extraordinary amount of dissatisfaction to which their results have given rise. Indeed, so much "feeling" has arisen, and so many nice points have been raised, that some means of modifying the method of conducting competitions would seem to be eminently desirable in the interests of all concerned. One point that has been made quite clear by coincidence of independent opinions of counsel, obtained by dissatisfied competitors in the case of the Middlesbrough Public Library designs, is that, under ordinary conditions, the competitors are absolutely without remedy, because the organisers of a competition are always safe in accepting the award of the assessor, who, not being a contracting party, is under no legal obligation to the competitors. The question no doubt bristles with difficulties; and it is to be hoped that the R.I.B.A. will give it careful reconsideration in the light of the somewhat harassing experience of the past twelvemonth.

Society of Architects and Registration.

The Society of Architects, which this year issued its twenty-fifth annual report, saw this year a most encouraging result of its long and strenuous fight for registration. The Society's Branch in South Africa promoted a Bill in Parliament, and it was read a first time in the Assembly at Pretoria at the end of June. It was then referred to a Select Committee, who, after hearing the evidence of the promoters, recommended the Bill for adoption by the House, and on July 7th the Bill was read a third time and passed without opposition. The Institute of Architects in New South Wales is working with the same object, and with a fair prospect of obtaining a similar measure of success. The one point of regret is that the Mother Country has not been able to show the Colonies a concrete example.

Quantities and Contracts.

One of the most considerable movements of the year was that which came to a head on October 13th, when a conference, convened by the President of the Quantity Surveyors' Association, was held at the Holborn Restaurant to consider the question of the non-provision of quantities by building owners when inviting tenders from contractors. A resolution disapproving of the practice was passed, and the conference recommended the Council of the Institute of Builders, the London Master Builders' Association, and the National Federation of Building Trades Employers, to urge their members to refuse to tender in competition without quantities for works costing £500 and upwards. This, and the revolt against the one-sided character of conditions of contract, and the designation of the official architect or engineer as referee in cases of dispute, have been among the burning questions of the year.

Earth Tremors.

Consequent on the Messina disaster, much attention has been directed towards earthquake resisting construction, and we have been able to publish the results of some careful observations on the spot by an English expert, who, while refraining from premature conclusions, has been able to put forward some very valuable suggestions on the subject. In May, a system was patented by Dr. J. A. Calantarients. It was described in our issue of June 23rd. Somewhat imaginatively, perhaps, earth tremors were at first thought to have caused the outstanding accident in this country during the year—the disaster at Newport (Mon. in June, when, by the caving in of a large dam at the new dock works, abou thirty lives were lost.

Professional Interests.

The question of architectural copyright ha been brought forwar very prominently. I has received due attention in th "Builders' Journal," and the case fo copyright was clearly and authoritatively put in our issue of May 26th. Th thirty-seventh annual congress of Frenc architects, which was held this year a Toulouse (June 20th-26th) was largel occupied with the question of apprenticeship, a fact that marks rather strikingl the wider horizon that the French architect allows himself as compared with hi British confrère. The Guild of Architects Assistants, the formation of which wa suggested in our columns by Mr. E. J Dixon, A.R.I.B.A., last year, began t take shape in March last, when the inaugural meeting was held at the Tudo Hotel, Oxford Street, W., and subsequently a successful meeting was held i Cardiff. The question of professiona tendering has been taken up with muc vigour by the Quantity Surveyors' Association, who seem to us to have right an reason on their side in objecting to th demoralising practice of inviting professional men to make bids for work.

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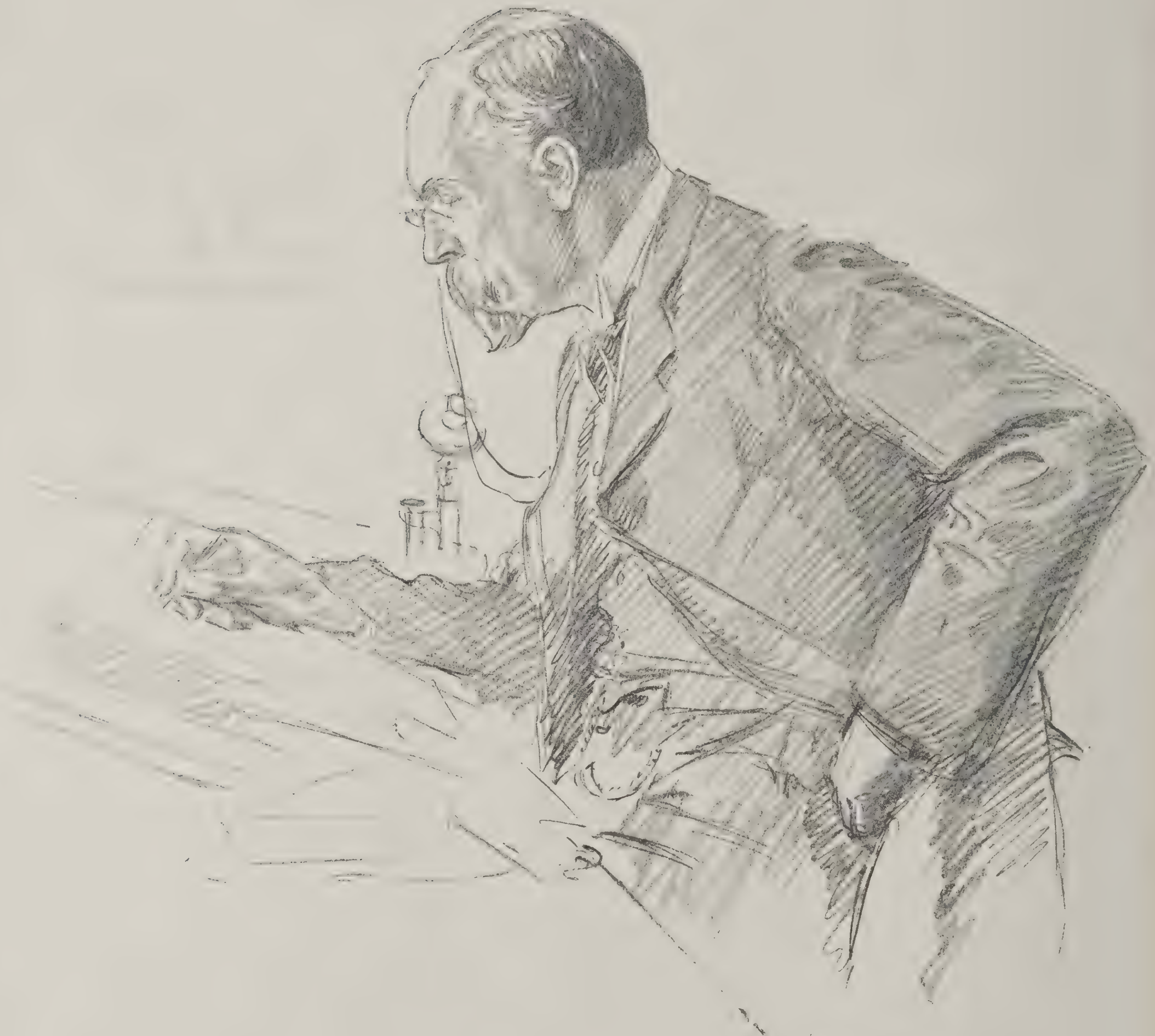


ARCHITECTS OF THE DAY—IX. PROFESSOR REGINALD BLOMFIELD, A.R.A., M.A., F.S.A., etc.

Sketched from life by our Special Artist.

Architectural Personalia. Mr. Alexander Graham resigned the office of hon. sec. of the R.I.B.A. after years of arduous and distinguished service. Sir Aston Webb was awarded a C.B. on the completion of the Victoria and Albert Museum. Mr. John Belcher was elected R.A. with Mr. Goscombe John the sculptor. Prof. S. D. Adshead was appointed to the newly-founded chair of Civic Design in Liverpool University. Dr. Arthur Evans was presented, in November, with the Royal Gold medal of the R.I.B.A. Two giants of the profession have died—on September 14th, Charles Follen McKim, of the great American firm of McKim, Mead, and White—and M. Auguste Choisy, who was chiefly known for his studies in architectural archæology. Each had received the R.I.B.A. gold medal. Portraits and biographies of both were given in our issue of September 29th.

In Parliament. In the Parliamentary Session of 1909, which was opened by the King in person on February 16th, the extraordinary Budget proposals overshadowed all other interests, and have undoubtedly had the very unfortunate effect of suspending building operations throughout the country, and this at a time when the industry had begun to hope for relief after a long period of depression. An absurd endeavour to tax clay as a mineral, which would have had the immediate result of crushing completely the already languishing industry of brickmaking, was happily abandoned in deference to vigorous representations by Mr. H. G. Montgomery, M.P., and in the Press, our own journal being by no means backward in opposing the ill-considered impost. The Housing and Town Planning Bill, reintroduced by Mr. John Burns, on April 5th, excited but little serious opposition in the House of Commons, and was passed by the House of Lords without serious mutilation. Several measures in which building interests were to some extent involved were carefully watched by the Employers' Parliamentary Committee—as, for instance, the Trade Boards Bill, and Mr. Churchill's Labour Exchanges Bill, which rapidly went through both Houses. The former was considerably modified in committee, and the building trades and other organised industries were, after influential representation, excluded from its operation. A Building Works Bill, introduced in March, was withdrawn in face of strong opposition from employers' organisations, and the Check-weighing Bill met with a similar fate.

Builders' Interests. Under the stimulating presidency of Mr. Ernest J. Brown, who happily unites an engaging geniality with splendid business capacity, the National Federation of Building Trade Employers has displayed extraordinary activity, and has done much to strengthen and improve its position and influence. It has held many important meetings—notably the half-yearly meeting at Portsmouth in the summer, and the Conference of Secretaries at Leeds in the autumn. The year has also been remarkable for the number of important questions that have been dealt with, such as the increasing employment of specialist contractors; the undue and ruinous delay of settlement for contracts; the imposition of inequitable conditions of contract; the non-supply of quantities for tendering; the unfair designation of the engineer or architect as arbitrator or referee in circumstances in which it is impossible to regard him as acting in a properly judicial capacity; the question of apprenticeship, and other matters, all of which have been taken up with vigour in the official journal. A large increase in membership is reported, partly as an effect of the inter-trading rule.

Architects of the Day.

IX.—Professor Reginald Blomfield, A.R.A.

When the history of contemporary architecture comes to be written, it will be recognised that to Professor Blomfield English architecture owes a very considerable debt, not only because he is one of our most erudite and scholarly architects, but also because he is one of the leaders of the higher education movement that has had such a beneficial effect upon our architectural schools and training. His appointment as Professor of Architecture at the Royal Academy was not only well deserved, but, apart from his undoubted merit for the post, was particularly fortunate. A professional capacity has been regarded as one rather of scholarship than accomplishment, but Mr. Blomfield brings to a wide knowledge of his art the invaluable experience of a large practice as a corrective of merely theoretical opinion. In addition to a keen analytical faculty he has the gifts of lucid exposition and literary expression which make his lectures a delight not only to his students but to that considerable public which is interested in the Art of Architecture.

Mr. Blomfield was born on December 20th, 1856, and is the third son of the late Revd. G. J. Blomfield, M.A., Rector and Rural Dean of Aldington, Kent. He was educated at Haileybury, and obtained an exhibition scholarship to Exeter College, Oxford, where he took a 2nd in Classical Mods., and a 1st in Classical Greats (1870). He played cricket for the Seniors during his College days, and cricket has always been one of his favourite recreations. It may be opportune, here, to correct a very frequent mistake by stating that he was articled to his uncle (not father), the late Sir Arthur Blomfield, for a term of three years. He also studied at the Royal Academy Schools, winning prizes of £10 and £25. Subsequently he travelled for some months in France, and he has, probably, a wider knowledge of French Renaissance work than any other English architect. Now that town-planning and civic design are so much to the fore, it may be

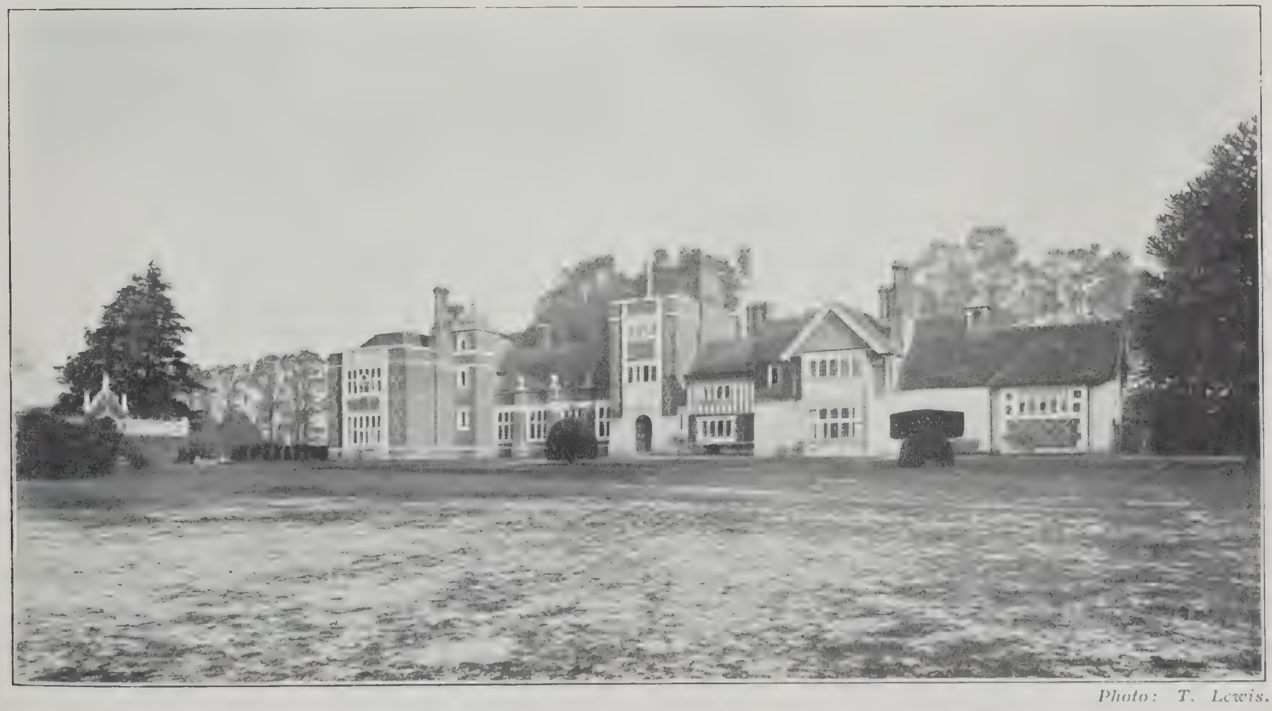


Photo: T. Lewis.

WYPHURST, CRANLEIGH, SURREY. REGINALD BLOMFIELD, A.R.A., ARCHITECT.

This house, recently completed, is a large extension and practical rebuilding of an older and much smaller house, seen on the extreme right, which, in turn, was an enlargement of a cottage. The wing on the extreme right has been converted into a private chapel.

of interest to mention that it was Mr. Blomfield who unearthed for English notice what is probably the first example of town-planning—the village of Richelieu, designed by Lemercier, as an adjunct to the great Cardinal's princely mansion, now destroyed, to house doubtless his numerous retinue. In spite of the vicissitudes of time and much unsympathetic treatment, the town is still so well preserved as to show the original scheme and architectural merit; and it is illustrated in the first "Town-Planning and Housing" Supplement of The Architectural Review next month (January, 1910).

Mr. Blomfield was a member of the Editorial Committee of The Architectural Review; was elected an A.R.A. in 1904, and appointed Professor of Architecture shortly after. He is also an Hon. Fellow of Exeter College, Oxford, a Fellow of the Society of Antiquaries, and a Fellow of the Royal Institute of British Architects, being elected a vice-president of the last-named body during the present year.

Since 1884, when Mr. Blomfield began to practice, he has designed a very large number of country houses and other words, of which it is impossible to mention more than a tithe here. But among his principal works are Apethorpe, Northants; Brocklesby Park, Lincolnshire, for the Earl of Yarborough; Boldre, Hants, for Mr. Herbert Alexander; Barwythe, for Mr. Ernest Alexander; new hall at Drakelowe, Derbyshire, for Sir Robert Gresley, Bart.; Elfordleigh, N.B., for Admiral Bainbridge; Caythorpe, Lincolnshire, for the late Mr. Edgar Lubbock; Cowley Place, Uxbridge, for Major A. Tylden Patterson; Chequers Court, Bucks, for Mr. Arthur Lee, M.P.; the Friars, Winchelsea, for Mr. George M. Freeman, K.C.; buildings at Haileybury College, and the South African War Memorial there; Heathfield Park, Surrey, for Mr. W. Alexander; Godinton, Kent, for Mr. Ashley Dodd; Gog Magog, Cambridgeshire, for Mr. Ernest Alexander; No. 6, Grosvenor Place, London, W., for Mr. George Albu; the Goldsmiths' College extensions, New Cross, S.E.; Saltcote Place, Rye, for Mr. R. Hennessey; Leasam, Rye, for Rear-Admiral Sir George Warrender, Bart.; No. 20, St. James's Street, S.W.; Knowlton, Kent, for Mr. Elmer Speed; Lady Margaret Hall, Oxford; Moundsmere, Hants, for Mr. Wilfred Buckley; Mystole, Kent, for the late Mr. W. Pomfret, M.P.; Mellerstam, N.B., for Col. Lord Binning; Murraythwaite, N.B., for Mr. W. Murray; The United University Club, London; alterations at the Oxford and Cambridge Club, London; Garnons, Hereford, for Sir John Cotterell, Bart.; Paul's Cross, St. Paul's Cathedral (now in course of erection); Portsea Parish Institute; Whitehall, Sandwich, and Hill Hall, Essex, for Mr. Charles Hunter; Sherborne School Buildings; Whitby School, Chichester; Wittington, Great Marlow, for Sir Hudson E. Kearley, Bart., M.P.; Wyphurst, Cranleigh, Surrey, for Sir Charles E. H. Chadwyck-Healey, K.C.B., K.C.; and Warehouse, Greycoat Place, for the Army and Navy Stores; London County and Westminster Bank, King's Road, Chelsea.

Of those we illustrate in this issue, Wyphurst, Cranleigh (p. 517), is a large extension and practical re-building of an older and much smaller house seen on the right in the view (p. 517). The older house was an enlargement of a cottage, and in the new buildings the house has been planned afresh with the exception of the old dining room. The old wing, seen on the extreme right, has been converted into a private chapel. To the west of the house an enclosed private garden with raised grass walks and water pieces has been formed.

The Warehouse, Greycoat Place, for the Army and Navy Stores (p. 518) is built on a site with a flat curved frontage formed by lines at a very obtuse angle with each other. The two ends are occupied by the main staircases, the centre eight bays on the ground floor are occupied with loading out stages at the front. The materials are

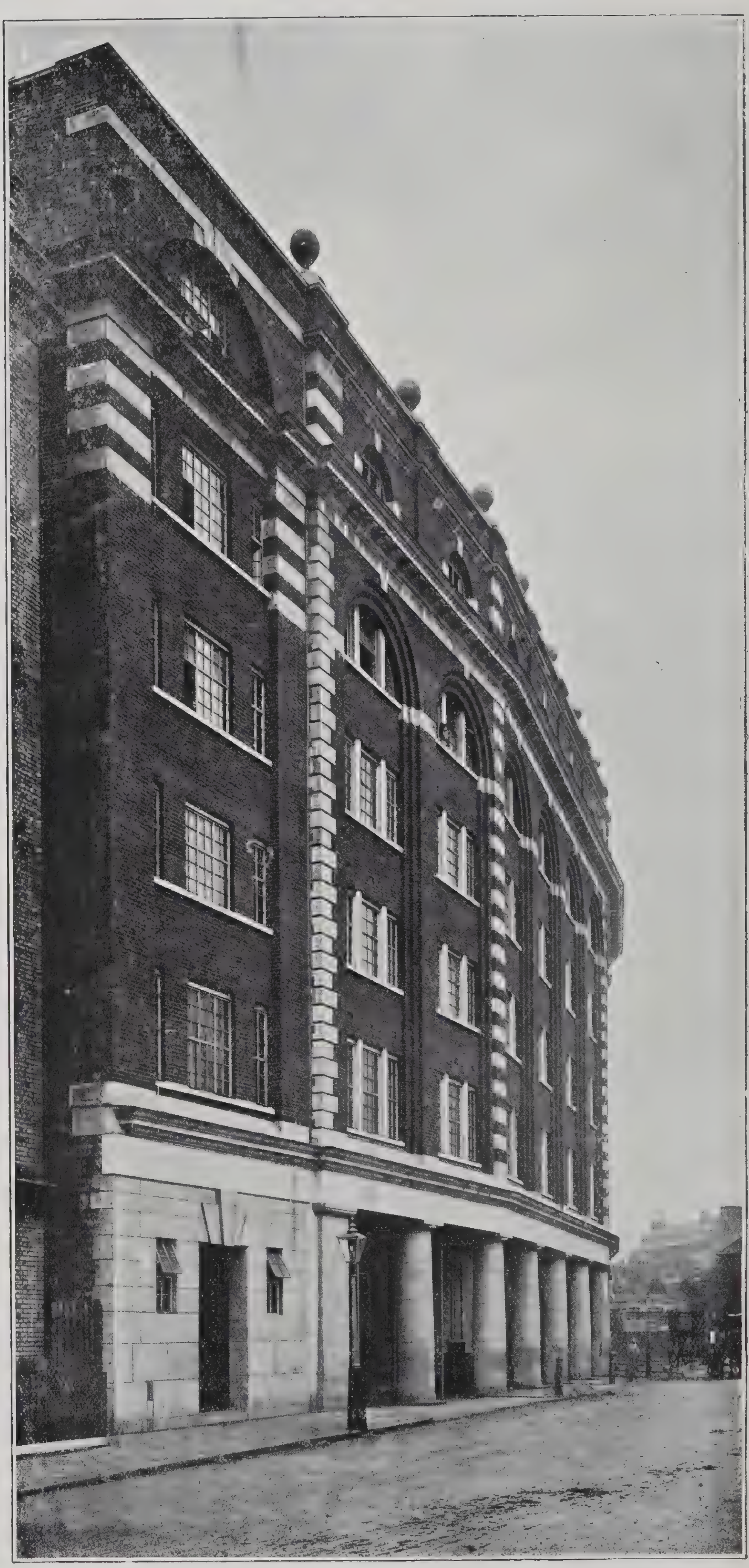


Photo: E. Docke

WAREHOUSE, GREY COATPLACE, WESTMINSTER, FOR THE ARMY AND NAVY STORES
REGINALD BLOMFIELD, A.R.A., ARCHITECT.

The materials are red stock brick and Portland stone dressings, with a base and columns of Cornish granite. The frontage is an irregular curve formed of lines at obtuse angles with each other.

red stock bricks for facings with Portland stone dressings and Cornish granite columns.

Whitehall, Sandwich (p. 519), is a golf box recently completed on the edge of the sea-shore between the Deal and Sandwich Golf-links. The walls are built with a hollow space, and "harled" or rough-casted on the outside, and the roofs are covered with Delahole slates.

Brocklesby Park (pp. 520, 521), was destroyed by fire in 1898, and rebuilt from Mr. Blomfield's designs during the three following years. The plan of the building was entirely re-arranged during the re-building, and large additions were made on the east and south sides, comprising a billiard room, dining-room, drawing-room, hall, library and principal staircase.

The South African War Memorial at Haileybury (p. 522), was erected to the memory of old Haileyburians who died in the war. It is a Portland stone obelisk, with bronze shields, swags, Cannon balls and cartouches. On the cartouches are the names of the sixteen battles of the war for which clasps were given. The winged heart is the school crest. On the shield facing the road is the inscription:—

> "HAILEYBURIENSIBUS IN AFRICA PRO PATRIA MORTUIS HAILEYBURIA FILIORUM MEMOR."

On the two sides are the words: "South Africa, 1899-1902," and on the shield facing up the avenue towards the school are the words:—

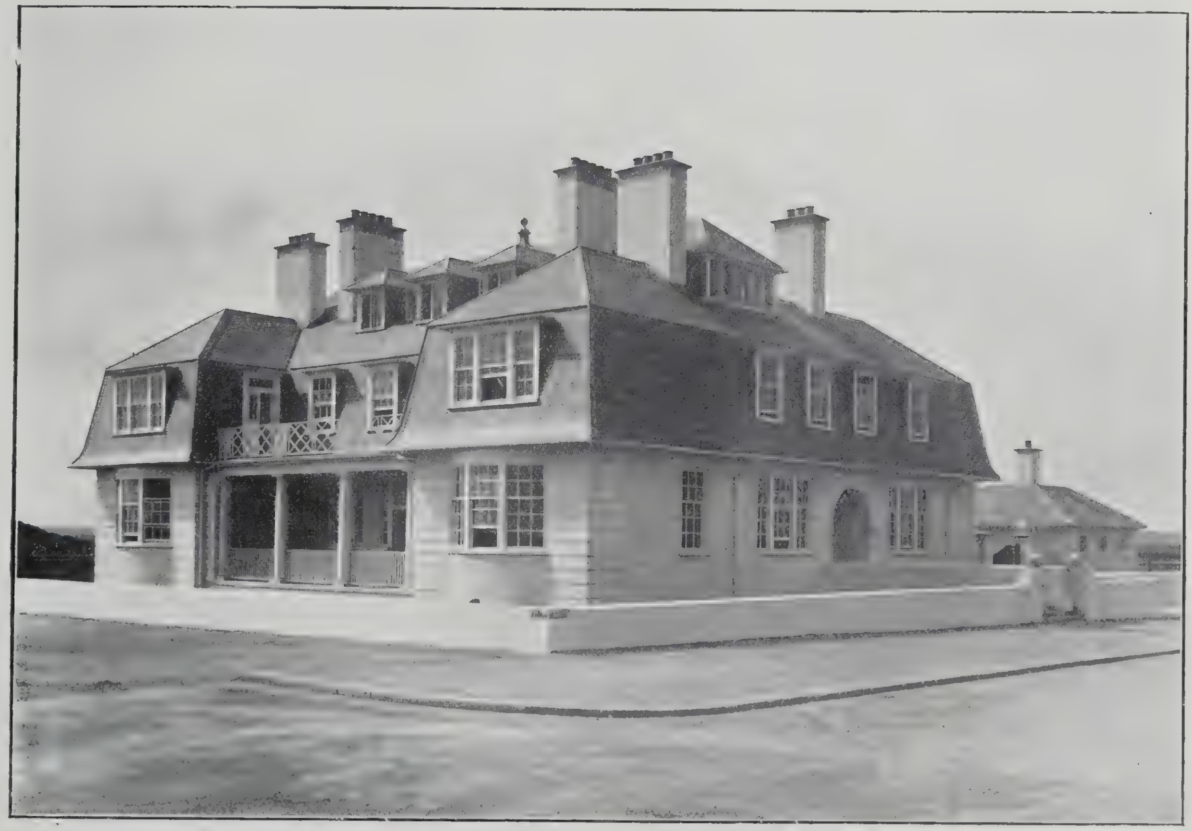
> "STA PUER, ET REVOCANS QUOS ABSTULIT AFRICA FRATRES. VIVERE PRO PATRIA DISCE MORIQUE TUA."

The obelisk stands on a pedestal 8ft. 9ins. high on six circular steps of Portland stone, enclosed by twelve stone posts with bronze collars and chains. The total height is 30ft.

Caythorpe, Lincolnshire (p. 523), was built for the late Mr. Edgar Lubbock, a governor of the Bank of England. The site selected was on the brow of a low hill on the north side of the valley that runs from Grantham to Lincoln, and here a large house was built of Ancaster stone, with bands of local ironstone. The stables, comprising stalls and four loose boxes, make a large building to the north-west of the house, and extensive lawns were formed on the hillside along three fronts of the house.

The United University Club, London (p. 524), is situated at the corner of Suffolk Street and Pall Mall East, and occupies the site of a former building. Considerable extra accommodation had to be given, and the plan had to be carefully considered to comply with this condition. The old club had a considerable area wasted by a grand staircase in the centre of the site. In the new plan the hall and staircase were placed at the north end of the building facing west down Suffolk Place. This arrangement also opens up the entrance to the Haymarket along Suffolk Place. The kitchen, offices and cellars are in the basement; on the ground floor are the entrance hall, main and back stairs, smoking-room, reading-room and lavatories; on the first floor are the club dining-room en suite, service room, lavatory, etc.; on the second floor, library, smoking, library, billiard-room, card-room, lavatories, etc.; on the third floor, billiard-room, card-room, three members' bedrooms, bath-rooms, lavatories, etc.; on the fourth floor, seven members' bedrooms, steward's room and boys' bed-room, bath-room, etc. A passenger lift runs to the third floor, and a double service lift to the fourth floor. There are also double service lifts from the basement to the service room on the first floor. The facades are entirely in Portland stone and the balconies, etc., are of wrought iron.

Amid the exigencies of a large practice, Mr. Blomfield has found time to exercise his literary gifts, and has published five books. "The Formal Garden in England" (1892), now in the 3rd edition; "A History of Renaissance Architecture in England," 1897, 2 vols., which is a leading work on this subject, and which he has abridged for the use of students, etc., in "A Shorter History of Renaissance in England," etc., published in 1900. "Studies in Architecture" (1906) and "The Mistress Art" (1908). During Mr. Blomfield's connection with "The Architectural Review," he contributed a number of papers to its columns, some of which have been included in his later books. Among these may be mentioned:—"The Architect of Newgate" (Oct., 1901), "The Italians at Fontainebleau" (Dec., 1902), from which we reproduce one of Mr. Blomfield's characteristic drawings, "Andrea Palladio" (April, 1903), "The French Primitives" (July, 1904), "Architecture and Painting" (Dec., 1904), "Philibert de l'Orme" (Feb. and March, 1904; January, 1905), and a critical note on "Greek" Thomson (May, 1904). He has also written for "The Nineteenth Century" and the quarterlies.



WHITEHALL, SANDWICH, FROM THE NORTH-EAST. REGINALD BLOMFIELD, A.R.A., ARCHITECT.

This house has been built on the edge of the shore, between Deal and Sandwich Golf Links. The walls are built with a hollow space and "harled" or rough-casted outside, and the roofs are covered with Delabole slates.

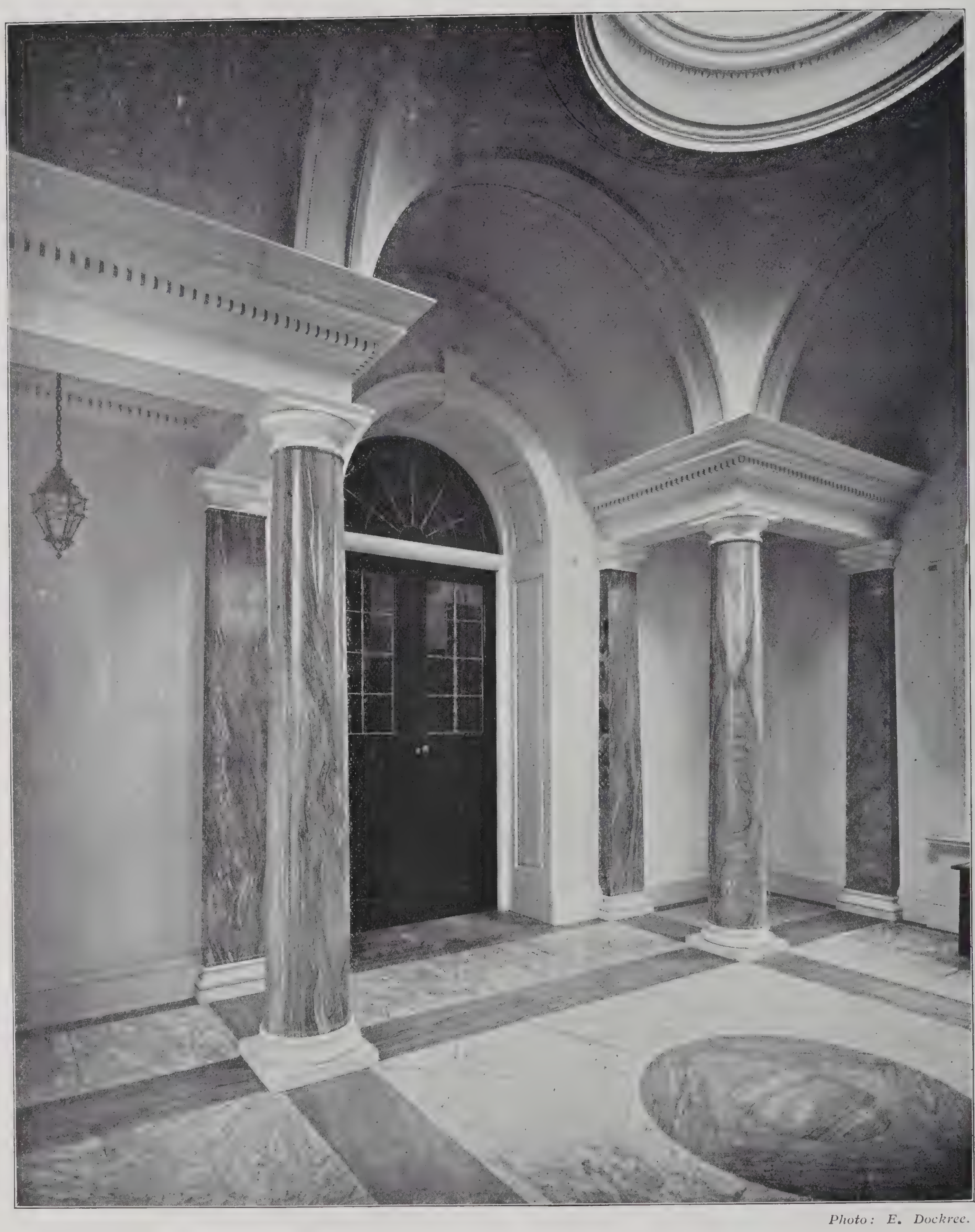


Photo: E. Dockree.

BROCKLESBY PARK, LINCOLNSHIRE: THE VESTIBULE. REGINALD BLOMFIELD, A.R.A., ARCHITECT.

The columns are of Greek Cippolino with statuary marble caps and bases, and the floor is of Cippolino and Piastraccia marble.

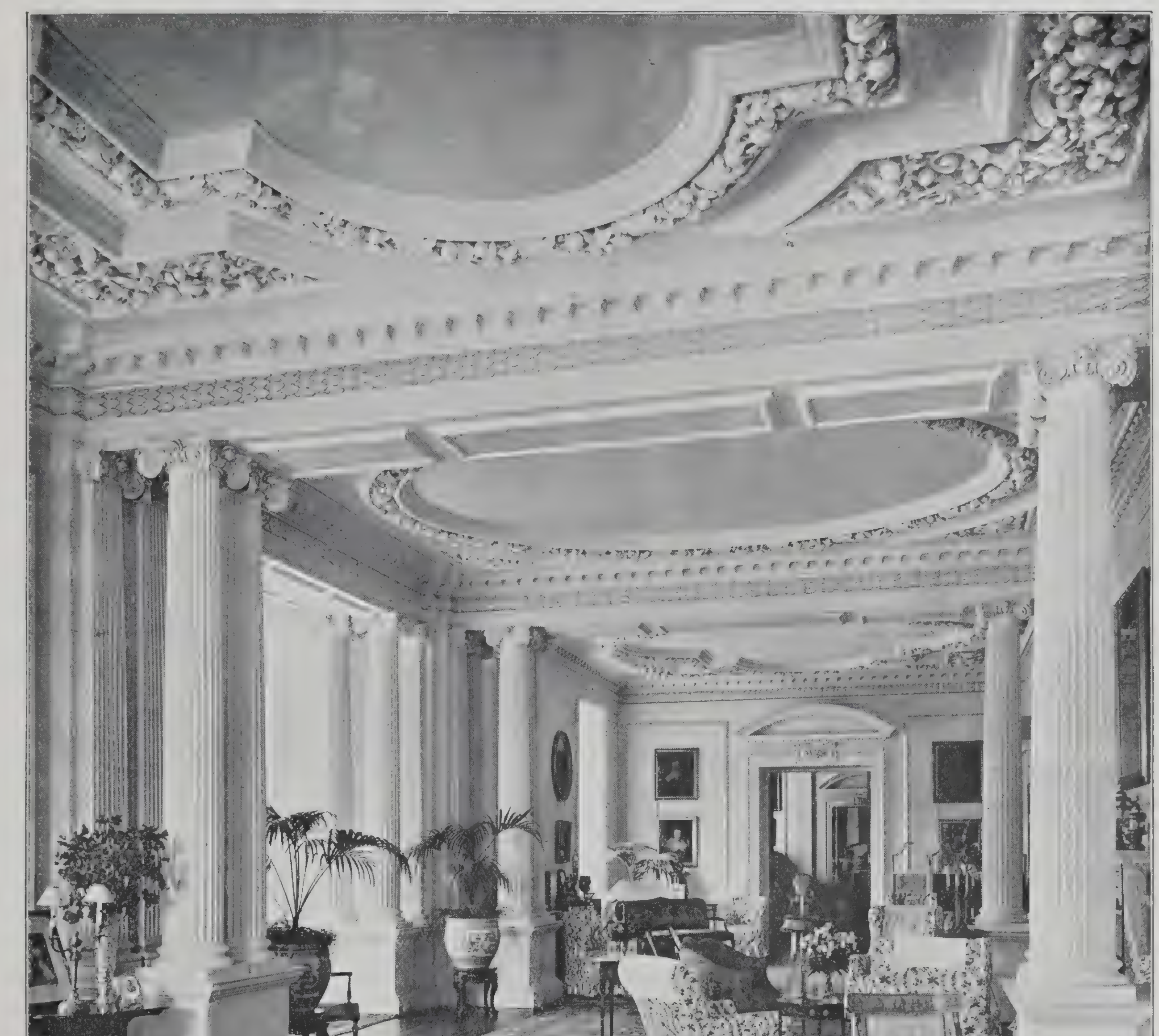


Photo: E. Dockree.

BROCKLESBY PARK, LINCOLNSHIRE: THE DRAWING ROOM. REGINALD BLOMFIELD, A.R.A., ARCHITECT.

The drawing-room is panelled and finished white. The floor is of oak. The ceilings are carried out in modelled plaster work, with fruit and foliage in heavy relief.

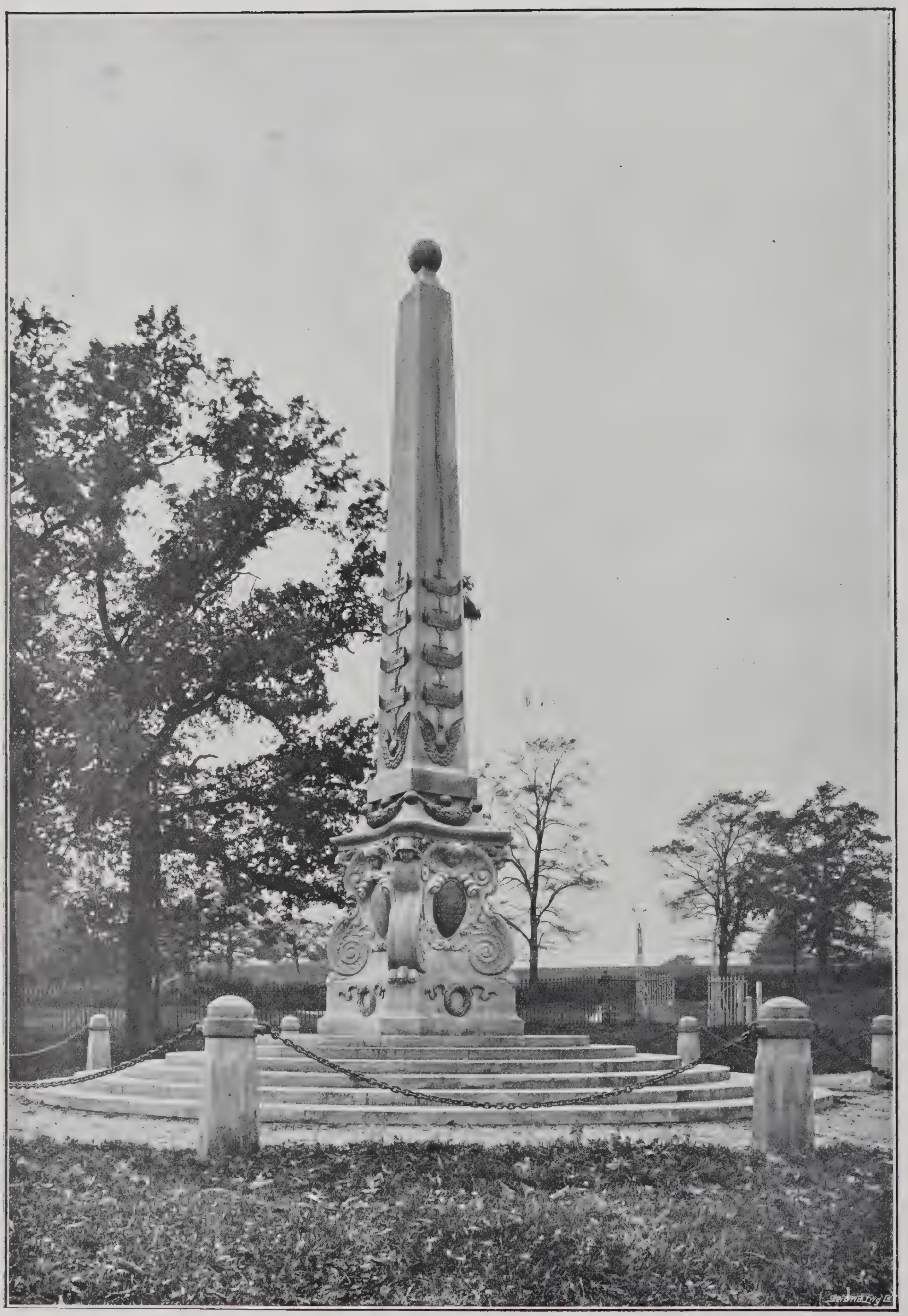
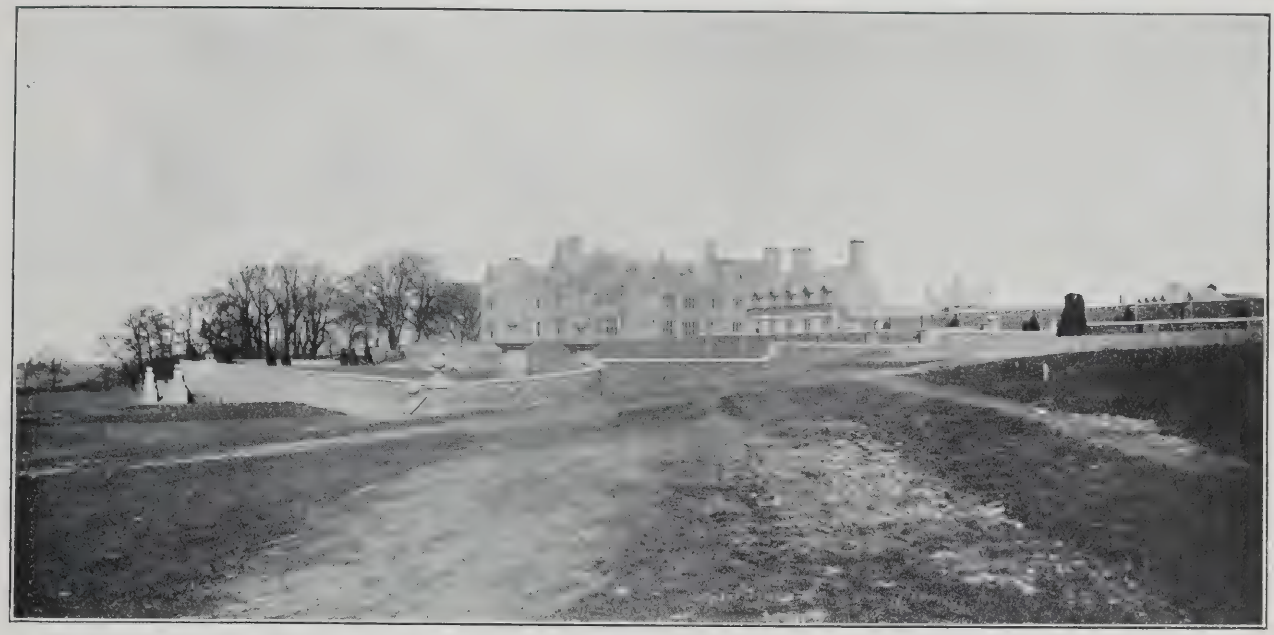


Photo: E. Dockree.

SOUTH AFRICAN WAR MEMORIAL, HAILEYBURY COLLEGE. REGINALD ELOMFIELD, A.R.A., ARCHITECT.

The Memorial, 30 feet high, is constructed of Portland stone, with bronze enrichments. It is set on six circular steps, enclosed with twelve stone posts having bronze collars and chains.



CAYTHORPE, LINCOLNSHIRE. REGINALD BLOMFIELD, A.R.A., ARCHITECT.
This is a large house built on the brow of a hill on the north side of the valley that runs from Grantham to Lincoln.

COPYRIGHT IN ARCHITECTURE.

One of the surprises of the year 1909 was the sudden prominence given to the question of architectural copyright. We have a note on the subject in another part of the present issue, but since that was written, the report of the Law of Copyright Committee has been published, and the portion of it which refers to architectural copyright may be usefully appended here. It is as follows:—

"With regard to architecture it is to be observed that in giving protection to actual works of architecture as opposed to plans made to guide the architect in his work, the Revised Convention goes beyond British law, which forbids copying plans of a building, but not copying the building itself.

"Plans and models appear to come under the head of 'literary and artistic works,' and as to them there has been no dissentient evidence given, nor any difference of opinion in the Committee.

"The evidence as to buildings themselves has been somewhat conflicting, but the Committee were much impressed by that of M. Maillard.

"It is clear that if the Revised Convention is to be followed with regard to works of architecture, the scope of British law must be enlarged.

"The Committee, by a large majority, have come to the conclusion, after due consideration of the evidence, that it is desirable to recommend that architecture be accepted as matter to be protected, both for the sake of uniformity and because it deserves to be protected and presents no difference in principle from that applicable to the sister arts.

"They further consider that protection should be given against copying buildings whether by use of plans or otherwise, and against use of drawings or models for other purposes than those authorized, and by other persons than those supplied therewith.

"With regard to the term 'architecture,' the Committee gather that the object of the article is to protect works of original and artistic character, and not works of common type which have been frequently produced on previous occasions.

"There may be difficulties as to remedies. Damages might not be technically provable, and destruction not permissible, as buildings are usually not the property of the infringer; but penalties might be awarded against any one who copies or is a party to copying."

The terms of the reference to the Committee were "To examine the various points in which the Revised International Copyright Convention signed at Berlin on November 13, 1908, is not in accordance with the law of the United Kingdom, including those points which are expressly left to the internal legislation of each country, and to consider in each case whether that law should be altered so as to enable his Majesty's Government to give effect to the revised Convention."

Euboeolith Patent Flooring, contractors to H.M. Government, 3, Victoria Street, Westminster, inform us that between 5,000 and 6,000 yards of their flooring has been laid in St. Mary's Hospital for Women and Children, Manchester—in fact, the whole of the flooring except that of the operating theatres.

Messrs. Joseph Robinson and Co., Ltd., Carlisle, alabaster proprietors, and manufacturers of plaster of Paris, Keene's, Parian, and Robinson's fireproof cement, etc., send for notice a pamphlet descriptive of their goods, and containing several illustrations of buildings at the Irish International Exhibition, in the construction of which their plaster was extensively used. As to the merits of the fireproof cement, many testimonials are given, including one from the late Sir E. Massey Shaw.

CAYTHORPE, LINCOLNSHIRE: VIEW FROM THE FIELDS. REGINALD BLOMFIELD, A.R.A., ARCHITECT.
The house is built of Ancaster stone, with bands of local iron-stone. Extensive lawns are laid out on the hillside on three sides of the house.

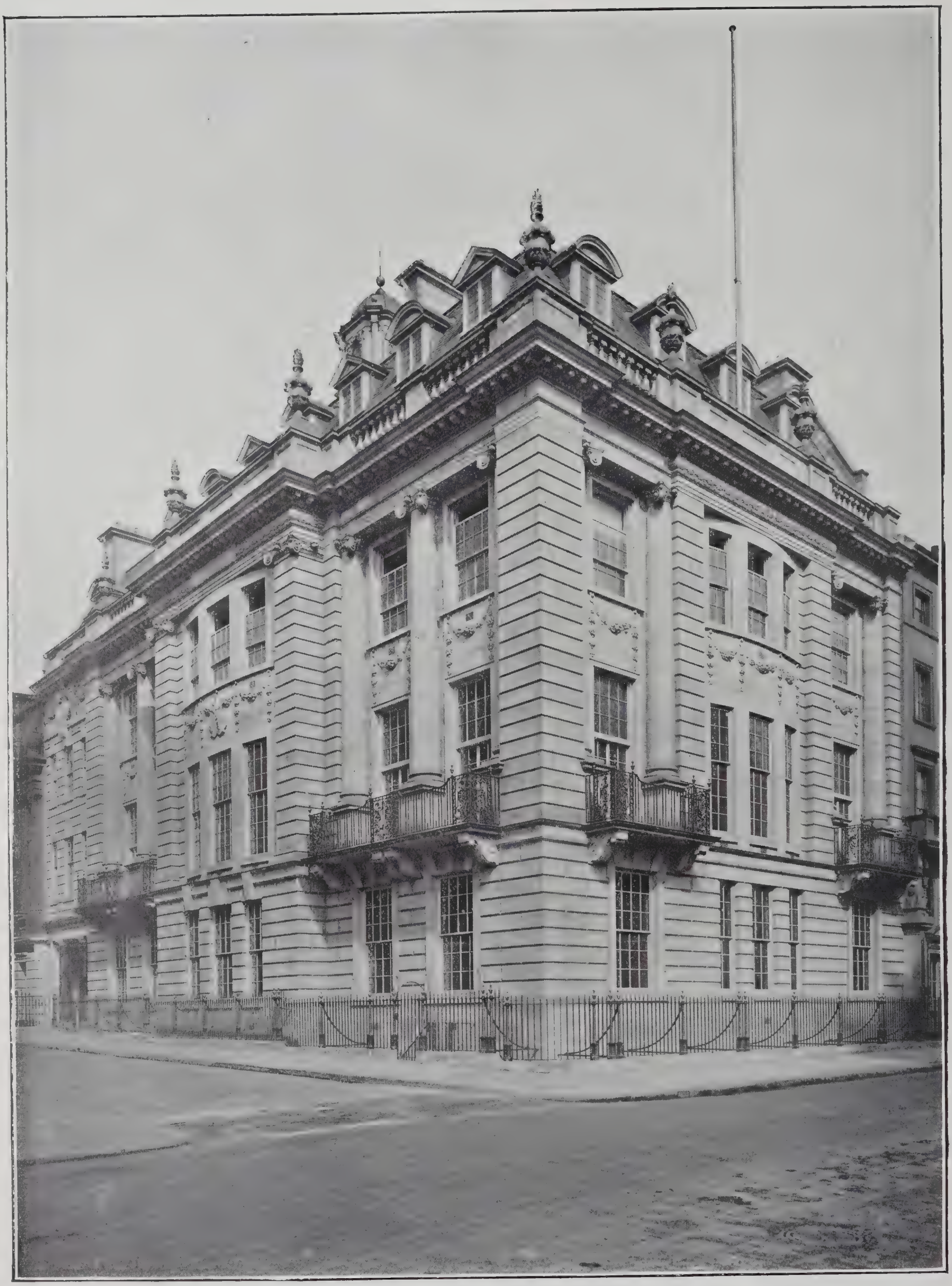
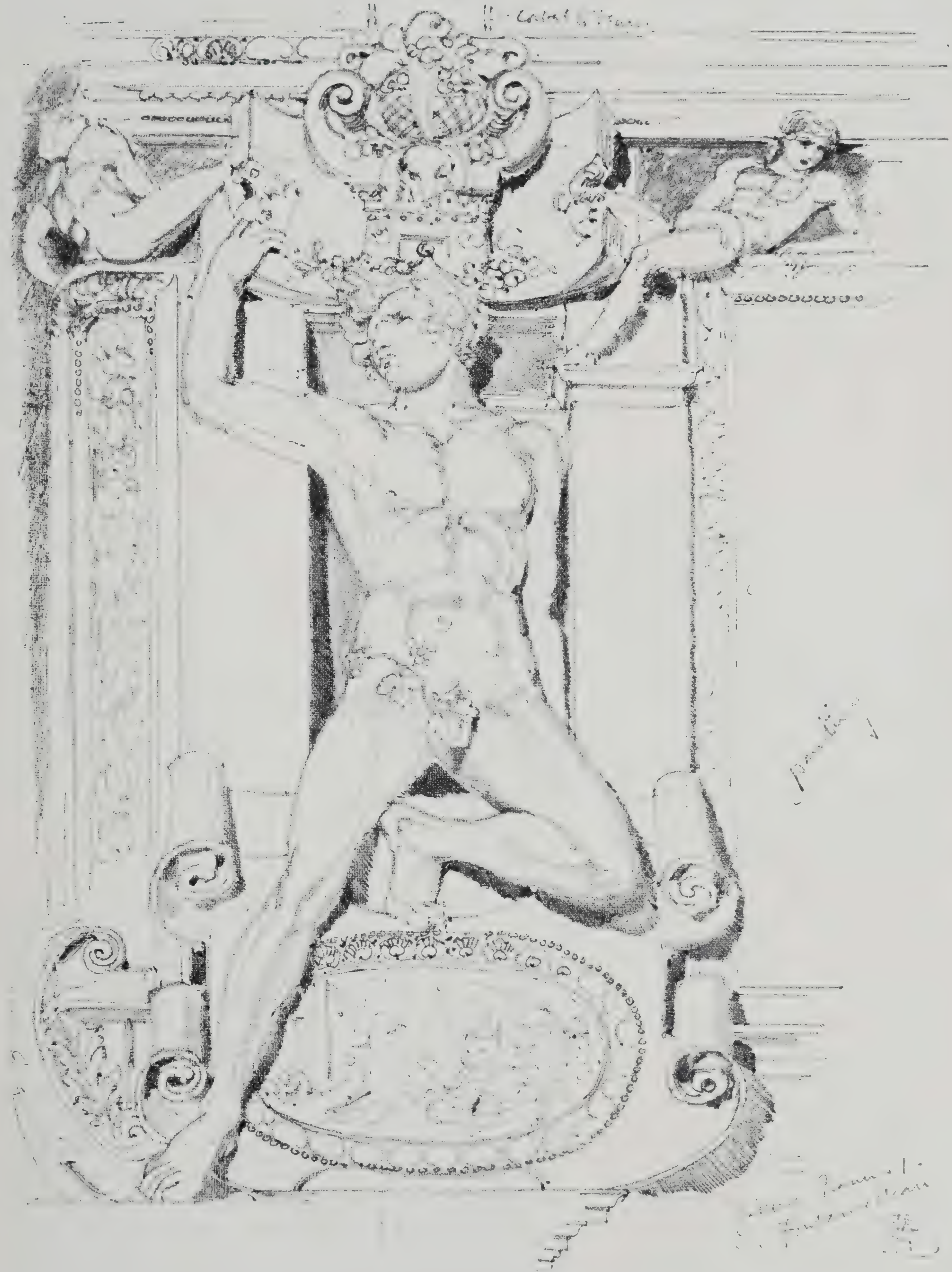


Photo: E. Dockree.

THE UNITED UNIVERSITY CLUB, LONDON, REGINALD BLOMFIELD, A.R.A., ARCHITECT.

This club is situated at the corner of Suffolk Street and Pall Mall East. It replaces the old club in which a large amount of space was wasted on a grand staircase. The facades are carried out entirely in Portland stone. The balconies and railings are of wrought iron.



STUCCO FIGURE AND ORNAMENT IN THE GALLERY OF FRANCOIS I., FONTAINEBLEAU.

(From the drawing by Reginald Blomfield, A.R.A.)

PICTURESQUE SCAFFOLDING.

By **A. G. H. Thatcher.**

In last year's special issue of this journal I was privileged to point out certain advantages (or disadvantages) that would accrue to a creative architect who could (or would dare to) embody in an architectural design some of the prominent features of scaffolding. I am not aware of any pressing desire to adopt the details of scaffolding as a motif for decoration. Where the artist has failed, the practical man has stepped in. To foretell the use of fumed oak in scaffolding certainly required a Christmas courage; but the reaction of the New Year did not prevent this fulfilment. For the erection of an extension to the premises of Messrs. Buchanan in Holborn, a gantry was erected in the nearest approach to brown oak that stain and water would give (Fig. 1). Its antiquity of appearance suggested that it might have been there from the middle ages, and it is said upon credible authority that the stranger in the town took it for the principal entrance to Staple Inn. Certainly, since the gantry has disappeared, Holborn has lost one of its principal attractions. Holborn, however, is not the only district that has been temporarily made beautiful by this means. Aristocratic Whitehall, and the otherwise prosaic Edgware Road, have also entered the lists. The erection of another Government building in Parliament Street afforded Messrs. Mowlem an opportunity for the display of artistic feeling, and the gantry built there has certainly added to their æsthetic reputation. (See Fig. 2.) Delicately tinted in blue and white, it set off the sombre grey of the neighbourhood with effect. But it has now gone the way of all gantries, and the building now stands naked and unashamed. Messrs. Allen, in the Edgware Road, have excelled themselves. (Fig. 3.) A pen and ink sketch of a scaffolding in Wardour Street, erected by Messrs. Dorey and Sons, is shown by Fig. 4. The design of the hoarding suggests the baronial castle, only a few portholes and a portcullis are required to complete the illusion. These examples seem to suggest the evolution of a new profession, that of scaffolding artist to builders. Some bold spirit may make a bid for it. He would deserve success, and (the Editors permitting) can be assured of my sympathy and respectful criticism next year.

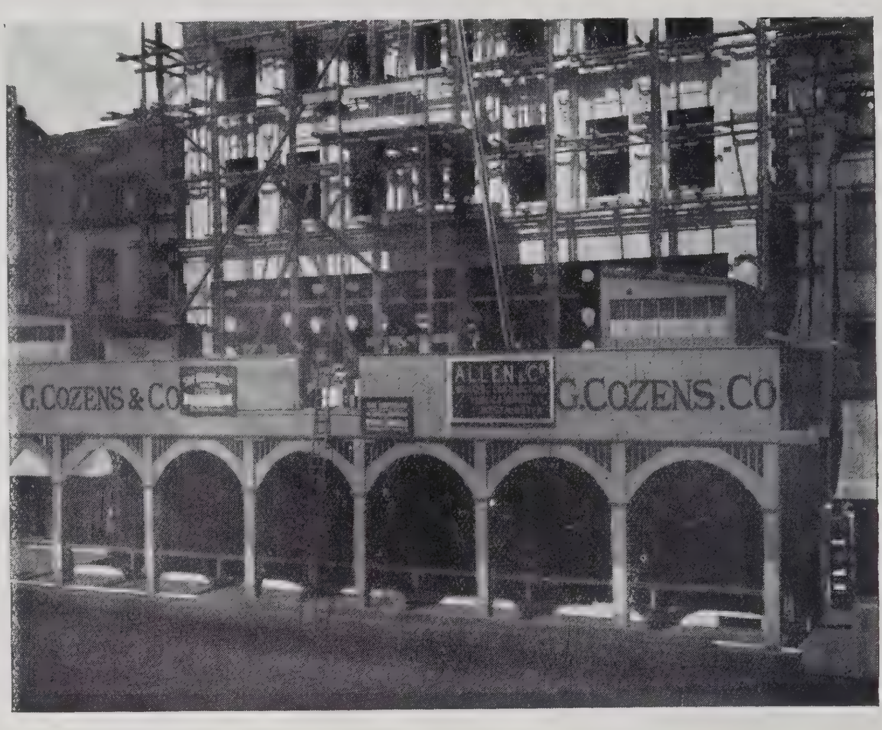


FIG. 3. SCAFFOLDING IN EDGWARE ROAD.

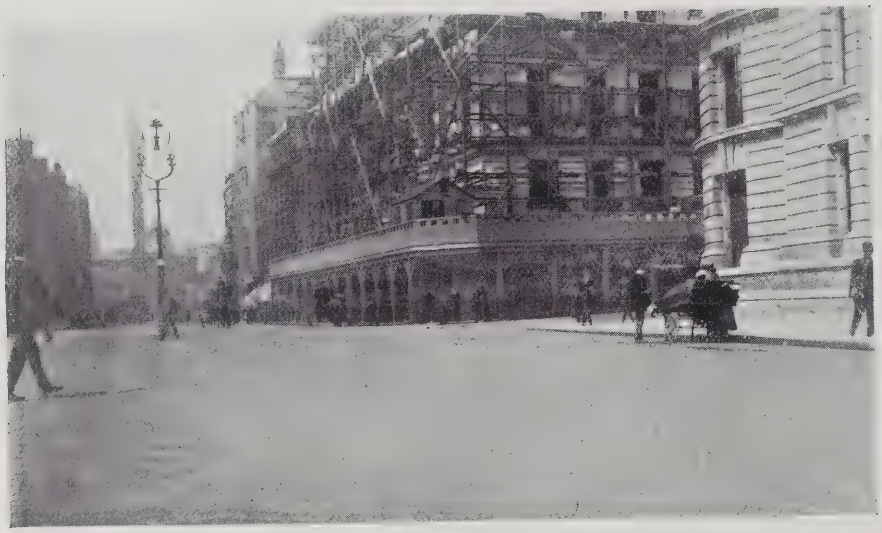


FIG. 2. SCAFFOLDING IN WHITEHALL ROUND THE NEW WOODS & FORESTS BUILDING.

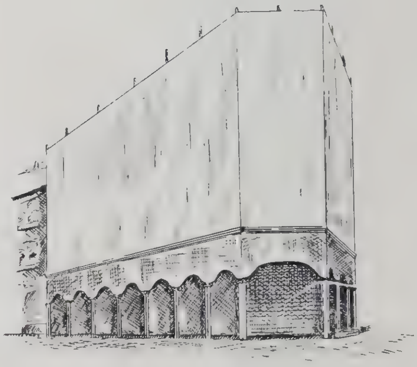


FIG. 4. SCAFFOLDING IN WARDOUR STREET.

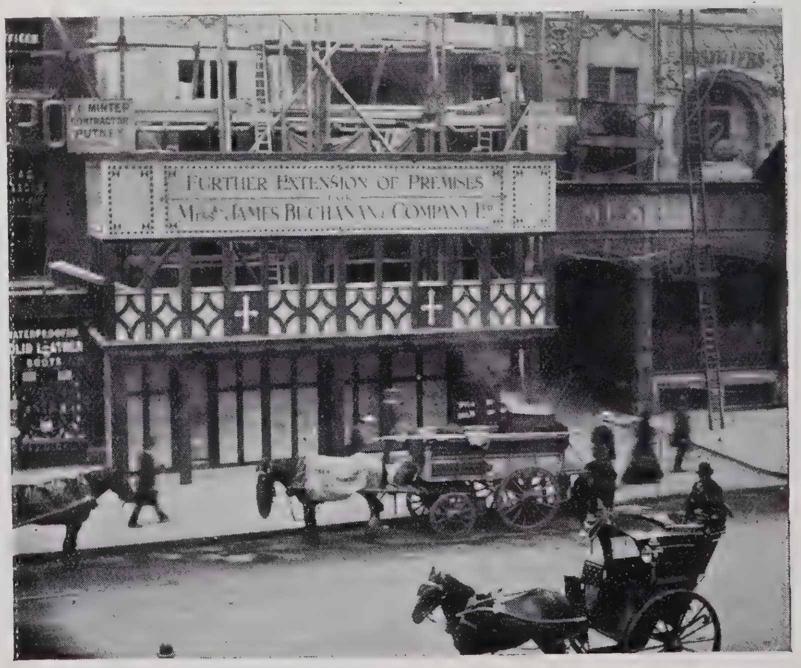

FURTHER EXTENSION OF PREMISES
MESSRS JAMES BUCHANAN & COMPANY LTD

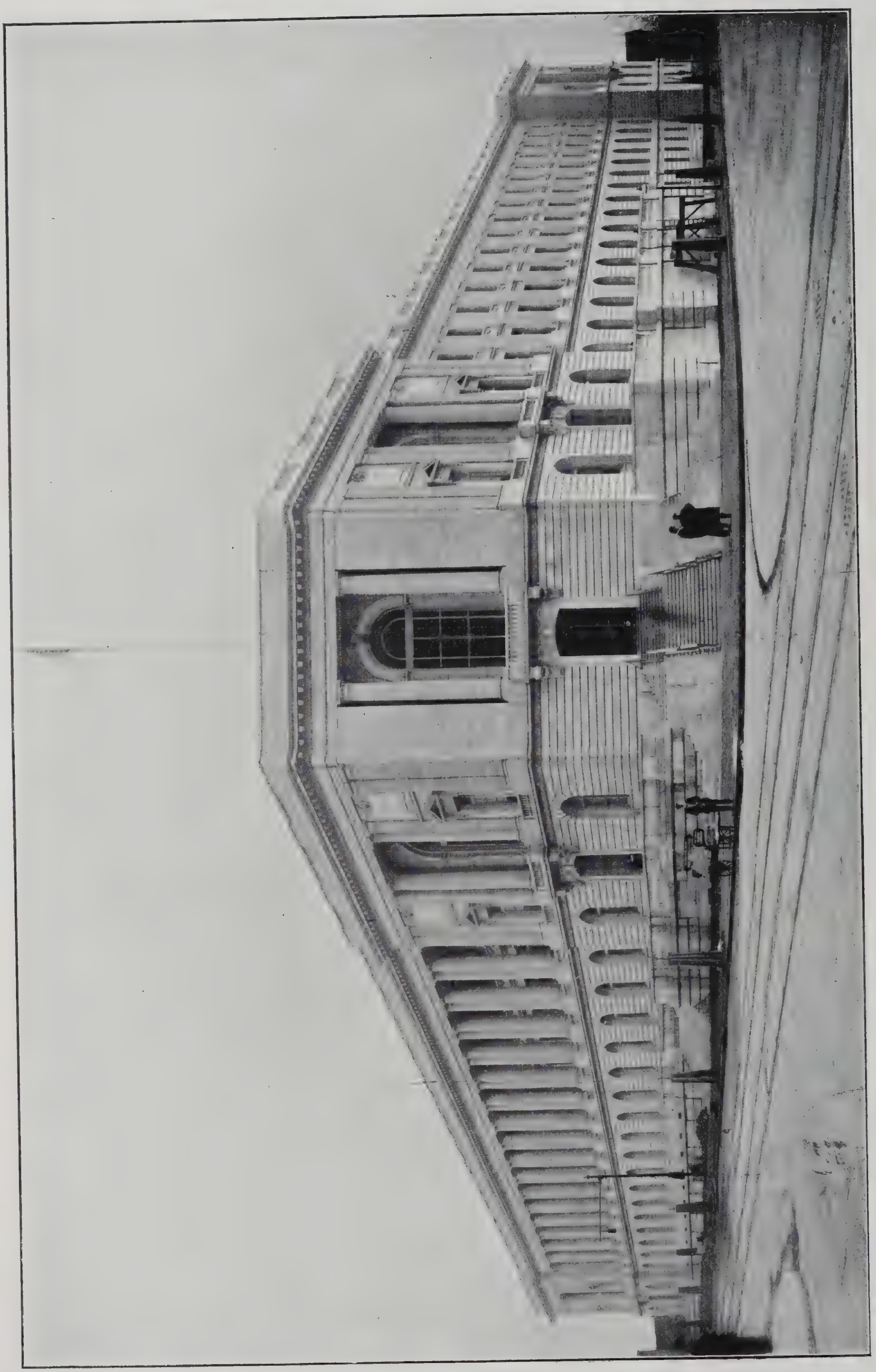
FIG. 1. SCAFFOLDING AT PREMISES OF J. BUCHANAN & CO., LTD., HOLBORN.

Special Article.

Modern AMERICAN ARCHITECTURE in Pictures.

THE CAPITOL, WASHINGTON.

140 Illustrations.



OFFICES OF THE MEMBERS OF THE HOUSE OF REPRESENTATIVES, THE UNITED STATES CAPITOL GROUP. CARRÈRE AND HASTINGS, ARCHITECTS.

The offices of the Senate are similar in design and form part of a symmetrical grouping.

MODERN AMERICAN ARCHITECTURE.

I.—General Sketch of its Rise and Progress.

INTRODUCTORY.

It is with keen pleasure that we present this copiously illustrated account of Modern American Architecture and of the men who have made it. American architects have always manifested a keen interest in British work; and if, hitherto, British architects have not adequately returned the compliment, the remissness is probably due to want of facilities. Never before has any attempt been made to place in the hands of British architects such a representative collection of examples of American work as that which is here produced; and we feel sure that it will be cordially welcomed as a substantial contribution towards the better understanding of a most interesting phase of the history of architecture.

The growing interest in American architecture was clearly manifested in the invitation to Mr. Francis S. Swales to deliver a lecture on the subject before the Royal Institute of British Architects. The compliment to American architecture was well deserved, and nobody is more competent than Mr. Swales to deal with the subject. He has done more than anyone else to promote a better understanding, in this country, of American work; and, in America, of British work; and to him the information on American architecture that has been collected in this special issue of the "Builders' Journal" is chiefly due. Mr. Swales's lecture, which was delivered before the R.I.B.A. in March last, attracted widespread attention, and still further stimulated the already strong desire to know more about American architects and architecture. It is in order to meet this demand that we have collected into handy form, from various sources, but more particularly from Mr. Swales's contributions to the "Architectural Review" and the "Builders' Journal," the matter and illustrations here given.

The lecture by Mr. Swales affords an admirable introduction to the subject, tracing the present-day developments to their beginnings in the United States when that country became a nation.

Pierre Charles L'Enfant.

Major Pierre Charles L'Enfant was one of the French colonists who lent their moral and material support to the American revolutionists during the War of Independence. He earned distinction as a military engineer; and when, as a result of the war, it became necessary to establish a "Federal town and a Federal House for Congress and for the executive officers, L'Enfant was commissioned to plan the city. Thomas Jefferson, the versatile Secretary of State, visited Europe, where he not only arranged diplomatic relations, but collected books, plans of buildings, and maps of cities. The maps, Mr. Swales conjectures, were obtained at the request of Major L'Enfant, to whom they were delivered. The maps selected were those of Paris, Orleans, Turin, Milan, Strasbourg, Carlsruhe, and Frankfort. Entrusted with an important scheme of town planning, he wisely sought the means of studying the best that had been done, and, with the aid of the maps and plans supplied to him, and probably with knowledge of the various works of Le Notre, L'Enfant evolved a plan for the city of Washington that was at once original, practical, and beautiful.

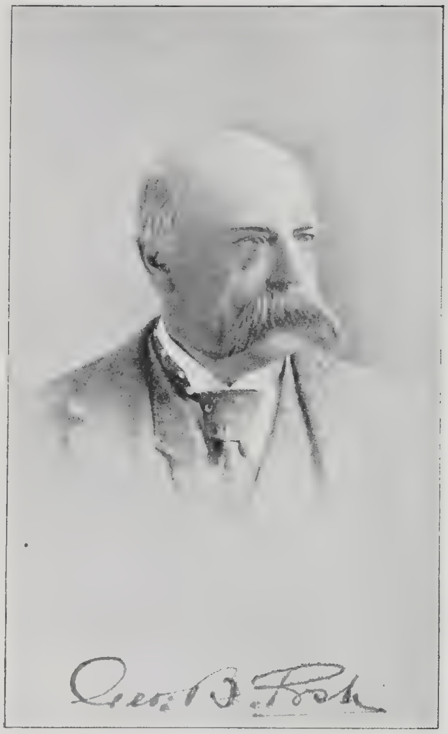
The City of Washington.

The beginnings of American national architecture, therefore, and perhaps the first considerable attempt at civic design, are to be found in the City of Washington. L'Enfant's plan provided for a central site for the Capitol—which was L'Enfant's designation of the Federal House—on the plateau at the intersection of two main avenues, running north and south, and east and west, and called respectively North, South, East and West Streets.

An Early Example of Civic Design.

The Capitol was situated in a large park from which radiated twelve wide avenues, including the four known as Capitol Street, and two of each of the others (those extending in opposite directions) were named after the States of Pennsylvania, Maryland, New Jersey, and Delaware. Other streets were then laid out parallel with the Capitol Streets, those extending north and south being designated by numbers, and those east and west by the letters of the alphabet. The President's house faced north and south in a park at the intersection of Pennsylvania Avenue and West Sixteenth Street. At the intersection of the principal axes of the Capitol and of the President's house it was proposed by L'Enfant to place the equestrian statue of Washington, voted by the Continental Congress of 1783; and from this point to the Capitol to develop the West Capitol Street into a magnificent avenue 400ft. wide and a mile in length, along each side of which, and situated each in the centre of its own grounds, were to be erected the "Grand Edifices," a "National Church," a kind of Pantheon for the reception of statues of heroes whom Congress might honour,

MR. DANIEL HUDSON BURNHAM.



Geo. B. Post

was mentioned in notes on early maps; and the engraved map of 1792 shows sites for buildings, monuments, and statuary, all arranged so as to present focal points along the principal streets, and, as L'Enfant says, "to reserve through the whole a reciprocity of sight" between the important points. Such was the plan approved by Washington and Jefferson, adopted by Congress in 1791, and entrusted to L'Enfant to carry out.

A special difficulty of town planning was at once encountered. All available land was bought up by speculators, who held it at exorbitant prices. Consequently, all that was done during L'Enfant's lifetime amounted to little more than the making of some of the principal roads.

Hallet, Thornton, Hadfield, and Latrobe.

In the year 1792 a competition was held with the object of obtaining a design for the Capitol; but of the sixteen designs submitted, not one was regarded as being fit for serious consideration. Afterwards, a New York architect of French extraction, Stephen Hallet, submitted a design which was approved; but immediately afterwards, a scheme submitted by Dr. William Thornton, a Philadelphia physician, who was an amateur of architecture, presented a design that greatly impressed Washington, who wanted to have it adopted instead of Hallet's. Then there arose a bitter controversy, Hallet declaring that Thornton, to whom the premium was awarded, had stolen some of his (Hallet's) rough sketches—a charge that was vigorously denied. Thornton, although he had studied in Paris, was not considered competent to superintend the work, and Hallet was made superintending architect. This did not end the quarrel. Hallet, showing that Thornton's plan was impracticable, was authorised to revise it. Thereupon Thornton got himself appointed one of the Commissioners. Hallet was then requested to hand over all his drawings to the Commissioners. He refused, and was dismissed. George Hadfield (an Englishman), who succeeded Hallet, was also badly treated and forced to resign. James Hoban, an Irishman, who had been clerk of works under Hallet, and who had won the competition for the design for the President's house, was next called in to continue the Capitol. He completed, in the year 1800, the north wing of the Hallet-Thornton design, which is now part of the central block. In 1803, Benjamin Latrobe, a pupil of Cockerell, was appointed to build the south wing and to rebuild the work upon the north wing that had been feebly executed under Hoban. Both wings were completed in 1811. The Capitol was destroyed by the British in 1814. Latrobe restored it, and designed the former House of Representatives, now known as Statuary Hall, and also the old Senate Chamber, which is now used as the Supreme Court of the United States.

Charles Bulfinch, of Boston.

When, in 1817, Latrobe resigned, the work on the Capitol was taken up by Charles Bulfinch, of Boston, who was the first American-born architect employed on the Capitol, and who designed the hall of the old Library of Congress, modified Latrobe's design for the dome, and designed the west front.

Latrope, whom Mr. Swales describes as an architect of incomplete training, had, like Jefferson, who, on retiring from Statecraft, practised architecture, much to do with the development of the so-called Classical Revival in America—the introduction of the use of Greek and Roman temples for buildings for all purposes. President Jackson appointed army engineers to construct Government buildings, and if a church was required, a Greek Ionic temple was presented; if a railway station, a Greek Doric temple was considered the correct thing.

Thomas Ustick Walter.

In 1850, when important extensions to the Capitol had become necessary, Thomas Ustick Walter, of Philadelphia, a Classicist, who used the orders with intelligence, refinement, and effect, planned and carried out the extensions and dome of the Capitol as seen to-day. When the American Institute of Architects was formed—patterned upon our Royal Institute—Thomas Ustick Walter was selected to be its first President. He was the last representative of American architecture as it was.

Richard Morris Hunt, R.I.B.A. Royal Medallist.

The architecture of the present in the United States may be said to have begun with Richard Morris Hunt, whom the Royal Institute honoured as the first American to which it awarded, in 1893, the royal gold medal. Hunt, when he returned to the United States in 1855, had been for ten years a student in the Ecole des Beaux Arts in the atelier of Hector Lefuel, and had worked under Lefuel and Visconti upon the construction of the extensions of the Louvre carried out during the Second Empire. He is accredited with the design of the Pavilion which faces the Rue de Rivoli, opposite the Palais Royal. Hunt was the son of a Congressman, and went directly into the office of Walter, working for him upon the Capitol for six months. He then returned to New York, where he found two or three architects endeavouring to resuscitate Gothic architecture by attempting to follow the so-called Gothic revival in England. Upjohn had

THE LATE CHARLES FOLLEN McKIM.

built Trinity Church with a great steeple, typifying religion dominating over New York—a stone exterior of pleasing design, fit to go with an old English vallage, and a vaulted interior—that is, "vaulted" in *plaster!* There were one or two other examples of this same sort of thing—a kind of old-world scenery, planted in little parks, amidst Greek temples serving as sub-treasury, hotel, and theatre. He set to work vigorously to change things. He started an atelier, in which he had as pupils Mr. George B. Post and Charles Gambrill, Professor Ware, and Henry Van Brunt. All of these pupils turned to the brand-new 'Gothic." Ware and Van Brunt practised together in Boston. Gambrill and Post, for a time, in New York.

Henry Hobson Richardson.

Upon the return to the United States, in 1870, of Henry Hobson Richardson, who had studied for several years in Paris, the firm of Gambrill and Richardson was formed; and in this office the late Stanford White worked as a draughtsman before he, too, went to Paris to study. Hunt had endeavoured to work in the *neo-Grec*, but seems to have found it an up-hill task, and, in spite of his best endeavours and his uncompromising contention against engineers designing architectural work, such buildings as the State War and Navy Department at Washington, the Capitol at Albany, and the Philadelphian city hall, went merrily on. Richardson returned after the war was over, and at the time that the country was being fairly inundated with Irish and Italian labourers, German mechanics, and fortune seekers and adventurers from all parts of the world, the administrative ability which America inherited from England was taxed to its utmost to preserve order and provide elementary education. Richardson almost immediately caught the rough, vigorous spirit of the times, and his Trinity Church at Boston, Court-house and Gaol at Pittsburgh, and Chamber of Commerce at Cincinnati, attracted the attention of the public to the difference between the work of the architect and that of the engineers and builders. Everybody wanted his building, whether a court-house or church, railway station or gate lodge, in "the Romanesque rock-faced style." Richardson's work extended all over the country. His design for the Cathedral at Albany was perhaps his greatest work, but the building, a commonplace Gothic structure, was not erected from his design. He died in 1886, and his influence upon the architecture of the country terminated when, in 1888, in the competition for the huge Cathedral of St. John the Divine, a Renaissance design by Messrs. Carrère and Hastings was placed first by the assessor over a number of the most original, impressive, and imaginative works that had been produced in Richardson's style, including the design in course of erection, a huge *tour de force* by Mr. William Halsey Wood, and the masterpiece of the period, the design submitted by one Buffington and made by the late Harvey Ellis.

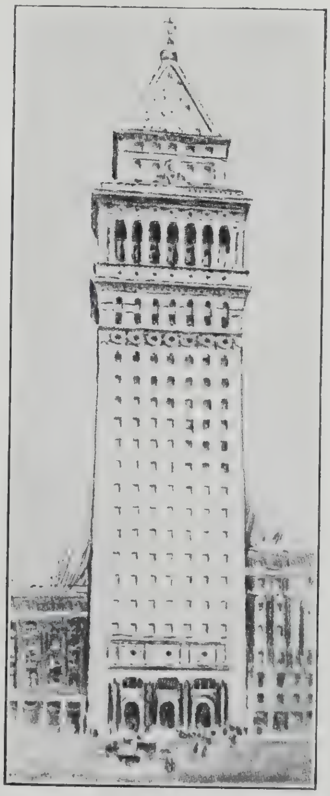
Hunt and Avery.

Hunt, who found his taste for classic work opposed by the wave of Gothic and "picturesque" popularity, had meantime compromised with the public by taking into association with himself Henry O. Avery, and together they produced the design for the William K. Vanderbilt house, Marquand house, and others in the French transitional styles of Francis I. and Louis XII. The Vanderbilt house was very successful. Henry P. Kirby, of New York, produced some fine imaginative studies in this style, which he published in his book of "Compositions." A number of strong men were won over to the style of the early French Renaissance, including Ellis, who produced some interesting work in St. Louis, among other things the City Hall; Bruce Price, of New York, who designed the Chateau Frontenac, an hotel for the Canadian Pacific Railway at Quebec; and Clarence Luce, of New York; Louis Hickman, of Philadelphia; Julius Schweinfurth and George Newton, of Boston, made studies of conspicuous merit, nearly all of which were produced between the years 1888 and 1892. In 1889 several works by Messrs. Carrère and Hastings were published, which had been built at St. Augustine, Florida, in the style of the Spanish Renaissance, but highly original and beautifully adapted to American needs, composed on lines of pure design and ornamented with paintings, mosaics, and decorative sculpture.

McKim, Mead, and White.

Messrs. McKim, Mead, and White produced several works in the Italian Renaissance style—the Villard houses and the Century Club; the Madison Square Garden (p. 601), with tower similar to the Giralda of Seville, and the New York "Herald" Building, by Stanford White. The publication of the early studies by Mr. McKim for the Boston Public Library, which clearly showed that it owed its inspiration to the Library of St. Genevieve, in Paris, had a very beneficent influence, and for several years was regarded by architects and the public generally as the finest example of architecture in the United States. Its extent and costliness indicated something of the demands for education of the citizens of Boston, and its conservative architecture is unquestionably only a reflection of the character of the representative people of that city.

The Columbian Exhibition afforded an opportunity, for the first time, of bringing together the combined artistic abilities of several of the then leading architects of the country. Again the best work owed its inspiration to French designs. From the time of this Exhibition down to the present day the history of the development of American architecture discloses a rapid march of progress. The Classic influence, re-established in the public favour by the Exhibition, has been maintained, and has been accepted in one or another of its manifestations throughout the country. Numerous architectural schools have been founded; and the old ones at the Cornell, the University of Illinois, and the Massachusetts Institute of Technology, improved their courses of instruction, modelled in principle upon that of the great school of Paris.



THE "SUN" OFFICE BUILDING.
BRUCE PRICE, ARCHITECT.

The Atelier System.

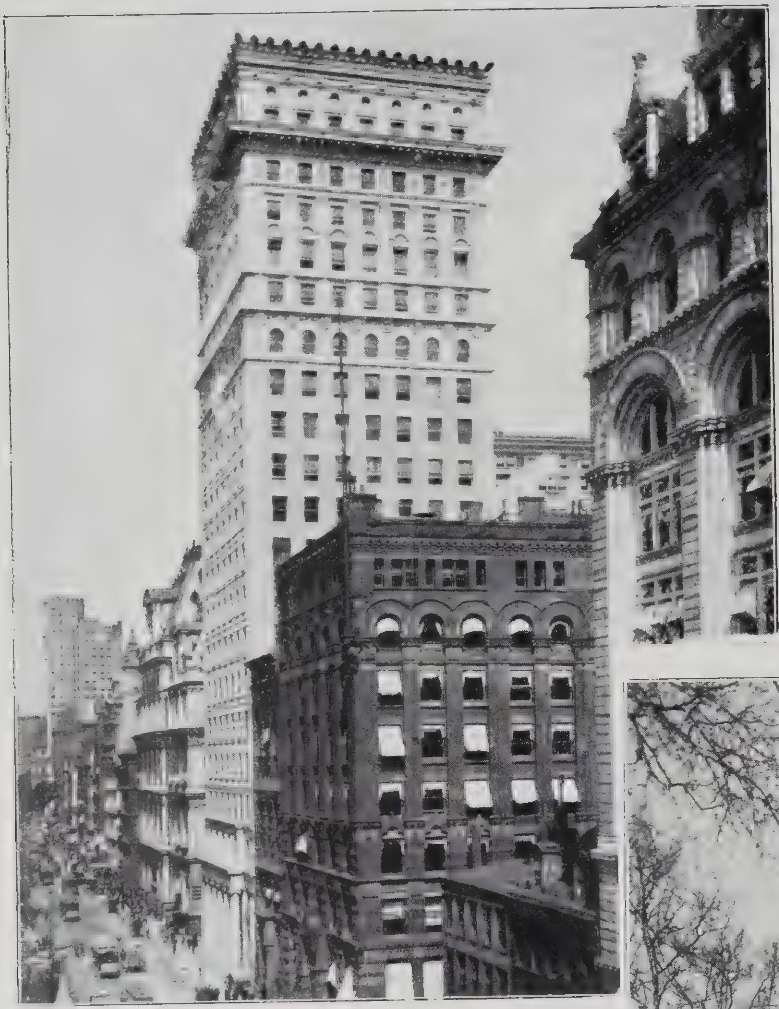
The atelier system, first attempted by Richard Hunt, was successfully inaugurated about fifteen years ago (by Mr. E. L. Masqueray, since Chief Architect of the St. Louis Exposition, who was at the time Hunt's chief assistant), and has been fostered by the Society of Beaux-Arts Architects, which has made its principal objective the education of the younger men; and by the Architectural League of America—a society composed of societies—whose members are the various architectural clubs, which, in several of the large cities do auxiliary work to that of the Society of Beaux-Arts Architects, especially as regards the education of those office-trained men whose circumstances prevent them from taking a regular course in one of the universities.

Some Notable Names.

It would, said Mr. Swales, be an almost Homeric catalogue that would attempt to include the works worthy of honourable mention which have been built since the time of the Columbian Exhibition. Among the leaders he mentions are: Daniel Burnham, the late Charles Follen McKim, George B. Post, John M. Carrère, Walter Cook, Thomas Hastings, Cass Gilbert, Whitney Warren, E. L. Masqueray, Henry Hombostel, Ernest Flagg, Louis H. Sullivan, and Peabody and Stearne, with fifty other "strong and brilliant men who have advanced the standard of design, and fifty more of the younger men whose work has already attracted attention." Their names are recorded in the "Journal" of April 14th, 1909, page 316.

Architectural Education.

The system of education, Mr. Swales observes, enables America to know who their strong men are while they are still young—a system that is competitive, the results of the competitions being made public. It is the French system—that of the Ecole des Beaux-Arts—where each student knows exactly the standing and record of every other student as well as his own in every subject. The entrance examinations are to the schools—not to the Institute. Before a student has spent much time or money, he knows whether it is likely to be worth his while to do so. Then the fellowship which arises out of friendly association with one another in the architectural clubs, the universities, and the ateliers in Paris, counts for much, and very much is due to the influence upon a large personal following of young men by such strong men as the late Charles McKim, John M. Carrère, George B. Post, Walter Cook, Cass Gilbert, and E. L. Masqueray; and of the college professors, Wm. R. Ware, A. D. F. Hamlin, D. Despradelles, Warren Powers, Laird, Fredk. M. Mann, Emil Lorch, Paul Cret, and others. More is owing still to the generous impulse of one of the present leaders who had a great opportunity to show his mettle and proved equal to the occasion. This



AMERICAN SURETY BUILDING, NEW YORK. BRUCE PRICE, ARCHITECT.

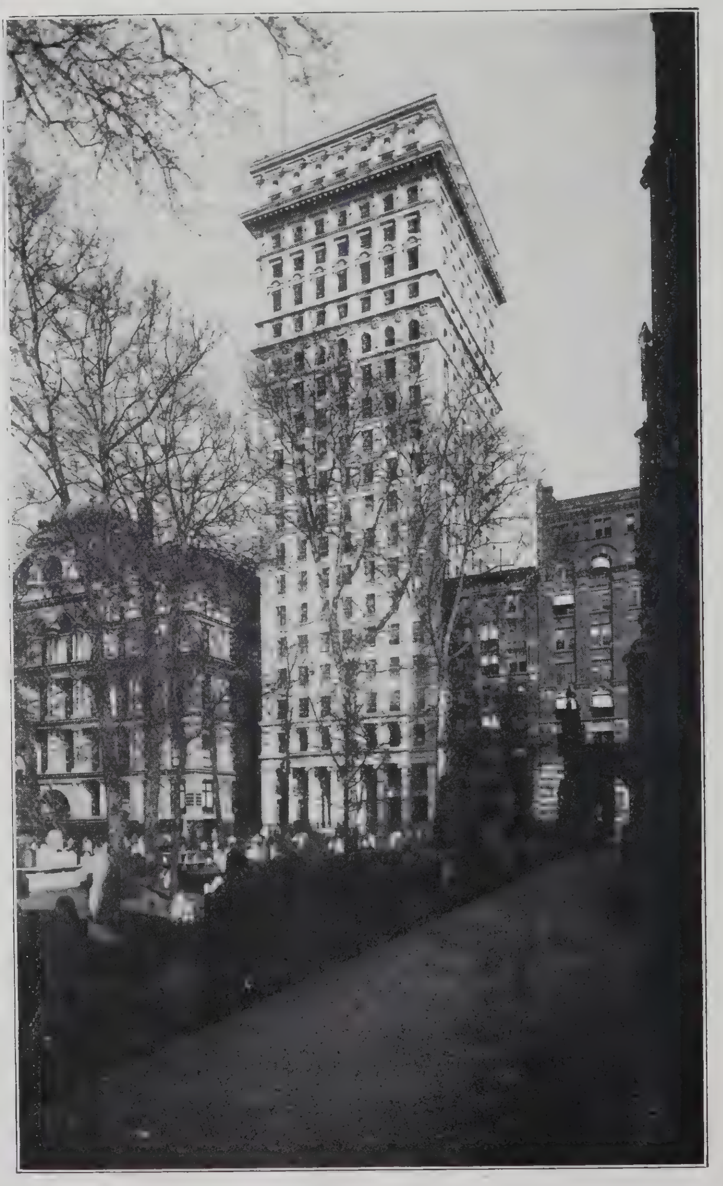
was the man who might have designed in his own offices all of the buildings at the Columbian Exposition, but chose rather to recommend the Exhibition Company to give out five of the largest buildings to his ablest contemporaries in his own town of Chicago, and five others to men practising in different parts of the country, whose loyalty to these co-workers was never found wanting, and whose integrity and ability—artistic, organising, and executive—proved him to be the fittest to lead, though he conceded himself that leadership to Richard Morris Hunt during his lifetime—Mr. Daniel Hudson Burnham, of Chicago, Chairman of the Senate Commission, which recommended to the Senate that the plan of the great L'Enfant should be adhered to.

Beginnings of American Architecture.

The architecture of North America is, as we have seen, not lacking in historical interest. Since architecture, properly speaking, did not appear there until about two hundred years ago, buildings did not begin to assume a distinctively American character until about the time of the Revolution; and, since that period, development, decline, change upon change, and one influence after another, have come and gone so rapidly that the buildings of the United States and Canada have acquired fresh characteristics almost as often as the countries have had a new Government. An adequate account of the rise and progress of American architecture would involve at least a sketch of the sociological, political, and commercial history of a country that has expanded with unexampled swiftness; and it is obvious that only the most salient outlines can be here given. In order to include what is of vital interest—what is characteristic of to-day—it is necessary to omit much interesting work showing the rise, zenith, and decline of a style, and much that illustrates abortive efforts to invent, revise, or introduce an effective style in place of Classic, which, in its various forms, appears to be the natural style of the Aryan race.

Foreign Influences.

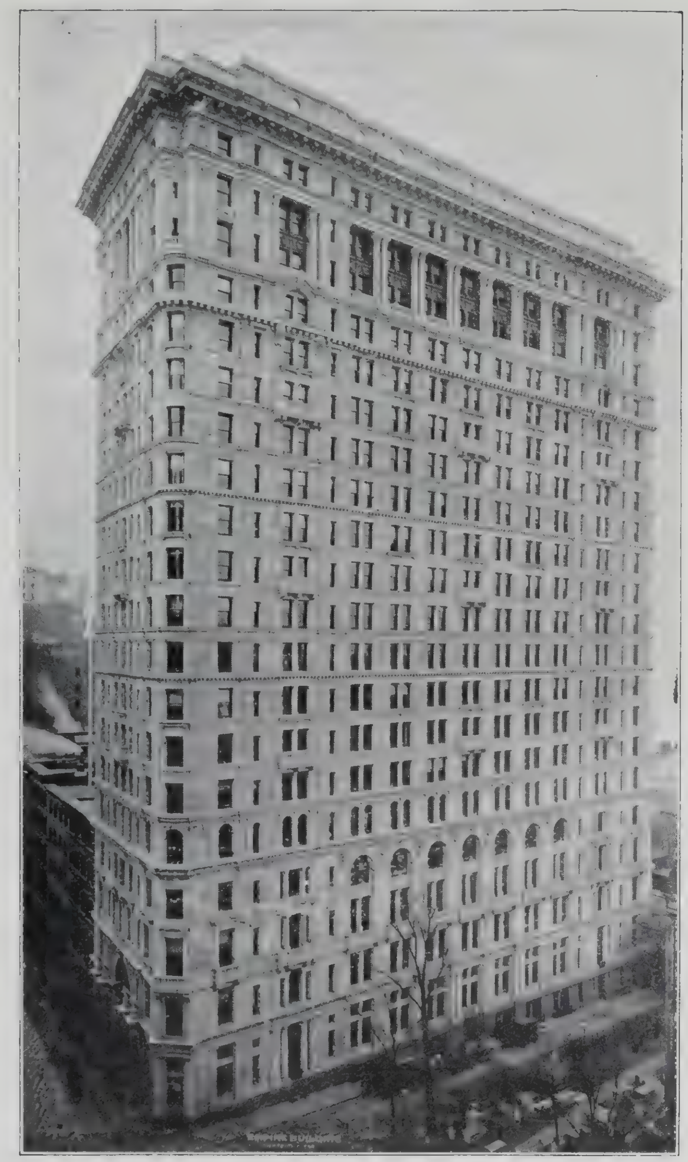
Certain tendencies as to style in classifying the different kinds of buildings according to their uses, are observable; thus, the public buildings speak the classic tongues with the modern French, fifteenth-century Italian, or eighteenth-century English accent—the accent most pronounced and most frequent being the first. The Roman Catholic and Episcopalian (Anglican) churches are usually some form of Gothic; so also are many of the buildings of the Universities—as at Princeton (New Jersey), Bryn Mawr (Pennsylvania), Yale (New Haven, Connecticut), Washington (St. Louis, Missouri), and the College of the City of New York. In former cases it is the natural and traditional style, but for the colleges seems rather an effort merely to imitate the older ones of Oxford and Cambridge. There are, indeed, exceptions where even this Gothic style has been given a new lease of life in the new world. The clubs, as well as the hotels, are almost invariably Renaissance in style, as, indeed, are most of those in London's West End.



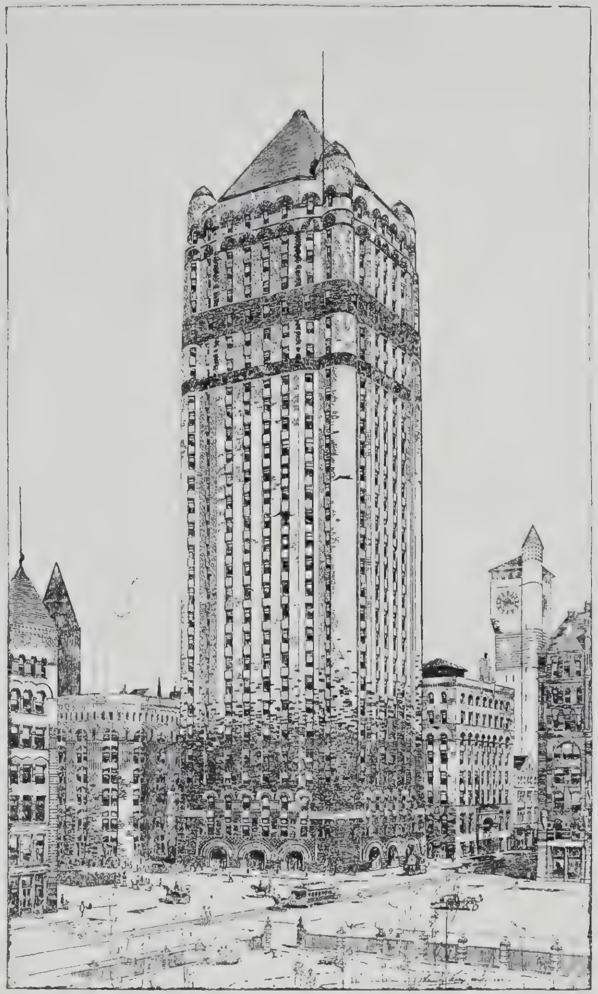
AMERICAN SURETY BUILDING, NEW YORK. BRUCE PRICE, ARCHITECT.

Domestic Styles.

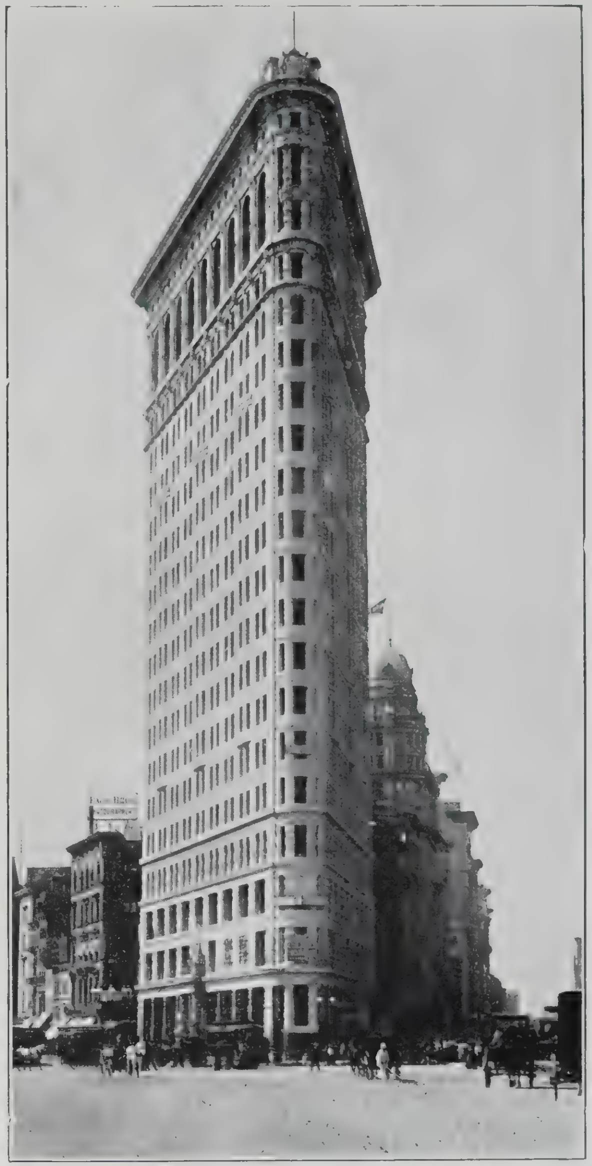
The residence shows the broadest eclecticism as regards style, relating something



EMPIRE BUILDING, BROADWAY, NEW YORK.
KIMBALL, THOMPSON, AND ALEXANDER MACKINTOSH, ARCHITECTS.



DESIGN FOR A TWENTY-EIGHT STOREY BUILDING.
HARVEY ELLIS, ARCHITECT.



THE "FLAT-IRON" BUILDING, NEW YORK.
D H. BURNHAM AND CO., ARCHITECTS

HANOVER BANK BUILDING, NEW YORK.
J. B. BAKER, ARCHITECT.

of the comparative wealth, social position, and sometimes also of the ancestry, of the people for whom it was designed—that is to say, the individual residence does; for there are in most of the eastern cities great rows of old houses that in some places are not unlike those of Bloomsbury, and that in others are more like those of Belgravia; while in still others they are unlike anything that ever was built anywhere at any time, or, let us hope, ever will be built again, and these are found in profusion in the west as well as east. One sees houses that may be compared with them in the terraced rows of suburban London—"Victorian" in style, brick in construction, stone of the "hand-carved" sort in "trimmings," suggesting only probable profit, at one time (since neighbourhoods rapidly decline), to the speculators who built them. In America, as elsewhere, there is a predominance of Renaissance as the style of architectural expression for the house—at least for the city house. In the country and smaller towns, the houses are free from any great influence of architectural precedents; but there is one thing written large upon the great majority of even the smallest and most insignificant of these dwellings, internally as well as externally—that is, the remarkable growth of good taste and refinement, and the manifestation of an extraordinary interest in architecture upon the part of the general public, which has taken place during the last two or three decades. This development is largely due to the influence exercised by the great expositions, and more directly perhaps to the extension of travel in Europe, and, further, to the founding of schools of architecture in connection with the Universities, which has gone on apace during the past twenty or thirty years. At the present time there are more than a dozen of these schools, affording excellent instruction, and architecture is becoming recognised as a study to be included in the "liberal" education of any man who pretends to scholarship. Not least, too, among the influences tending to improve taste and further interest in the study of the science of the beautiful in art and in the work of the artists of the day—in architecture, painting, sculpture, engraving—has been that of the illustrated press, the editors of which have shown a determination, not less wise than kind, to take the side of the artist and uphold him in the struggle against ignorance.

Influences Favourable to Art.

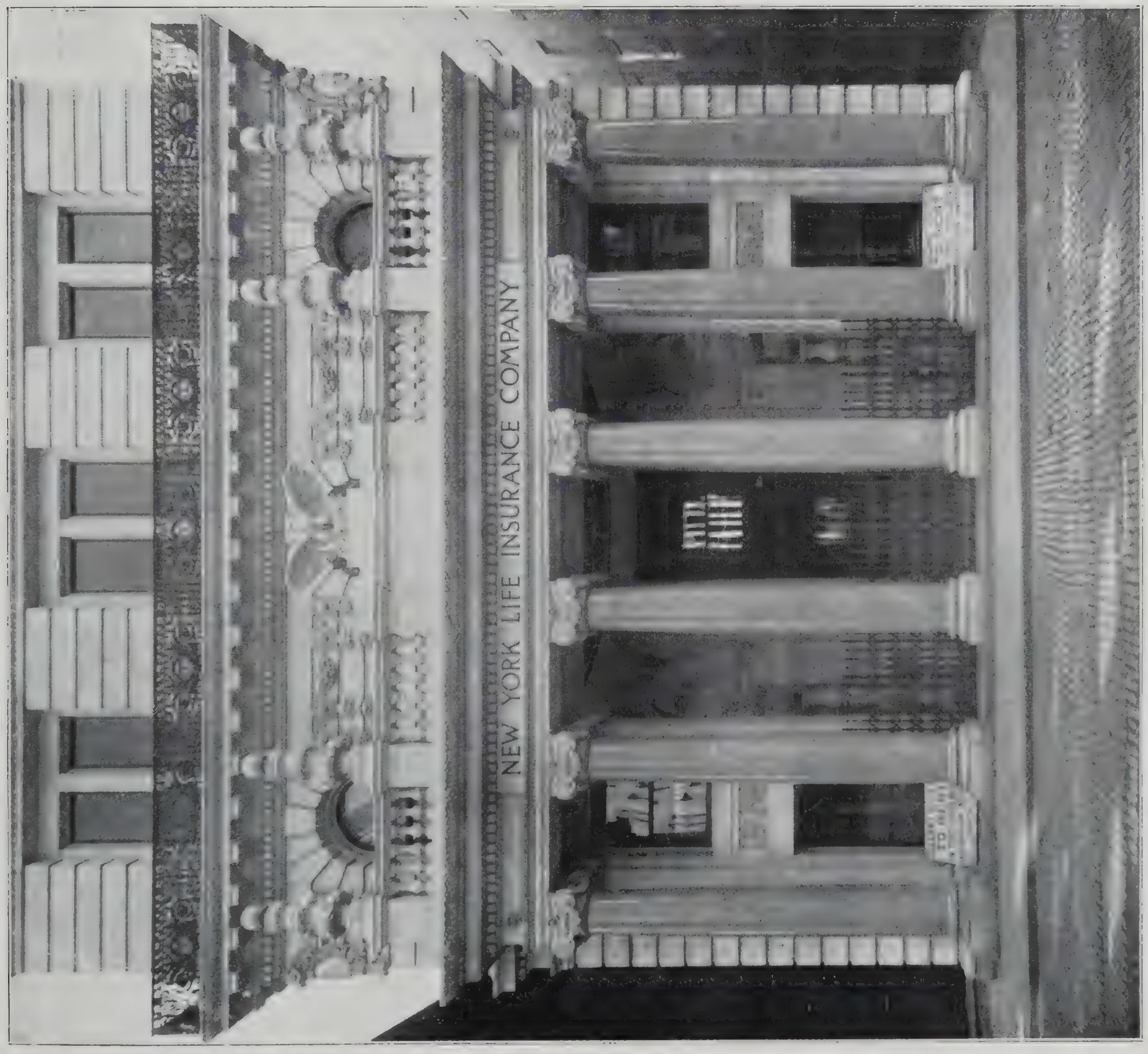
These influences, while their most apparent effect is seen in the design and furnishing of the residence, are reflected in all branches of architectural work. They have taken hold upon everything, from the seaside shack or bungalow, to the vast palaces of Newport and New York; from the lamp-post in the street, to the heroic monuments in the fine parks; from the diminutive village hall, to the great structures of the Government; from the small shingled chapel of the Free Methodist, to the inspiring cathedrals of the Anglican and Roman Catholic; from the country inn to the huge hotels of the large cities. The architects have even grappled with that most difficult of subjects for artistic treatment, the commercial structure, essaying to convert it to decency, and to convince its builders that something more than economy is necessary to their life. They have so far succeeded that whether it be the small shop or the office building two hundred feet square and ten or fifteen storeys high, or the thirty and forty storeyed towers recently completed, there is the same tendency to observe the canons of good taste and to develop a distinctively national character. Whether or not the building is devoid of architectural ornament, there is lavishness in detail, painting, and sculpture, there is in all of the recent work of architects—the word is here used in its proper sense: the master builder who builds beautifully—there is evident always an understanding of the fitness of things; a desire to fulfil and not to avoid or waive utilitarian requirements, and an apparent healthy desire to eliminate what is superfluous; so that the solution is scholarly, simple, direct, beautiful.

II.—Some Makers of Modern American Architecture.

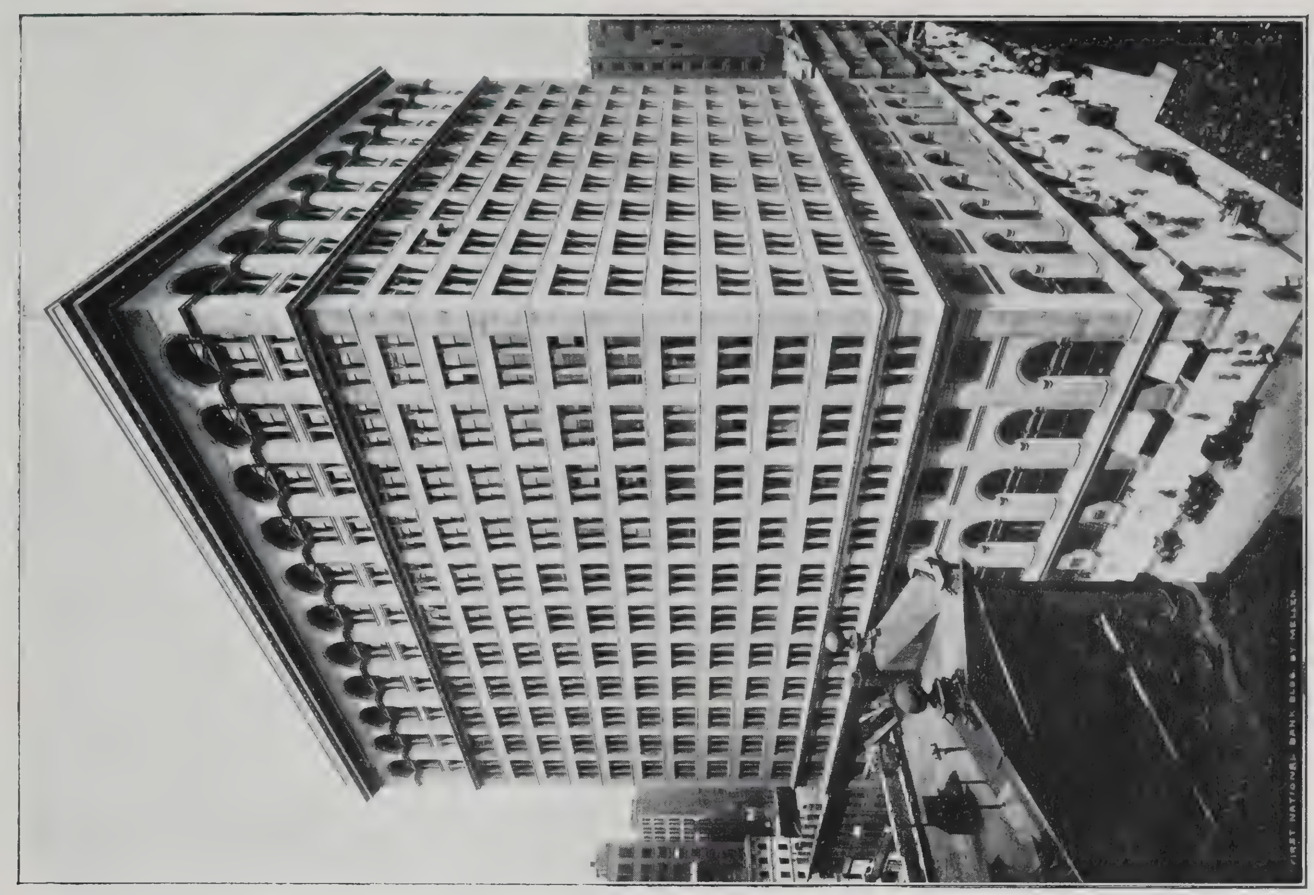
MR. GEO. B. POST, OF NEW YORK.

George Browne Post was born December 15th, 1837, educated as an engineer in the University of the City of New York, and graduated in 1858. It was in that year that the late Richard Morris Hunt first opened his atelier for students, and Post entered this school at the same time with the late Charles D. Gambrill, who was first his partner, and afterwards the partner of Henry Hobson Richardson. In the year 1861 the Anti-Slavery War took Mr. Post away from his practice, and kept him for some years in the service of his country. This dissolved the firm of Gambrill and Post. The war over, Mr. Post returned to the practice of architecture, and began to come into prominence as the architect of large and important buildings about the year 1875; and during

NEW YORK LIFE INSURANCE BUILDING, NEW YORK.
McKIM, MEAD, & WHITE, ARCHITECTS.



NEW YORK LIFE INSURANCE BUILDING: DETAIL. McKIM, MEAD, AND WHITE, ARCHITECTS.



FIRST NATIONAL BANK, CHICAGO. D. H. BURNHAM AND CO., ARCHITECTS.

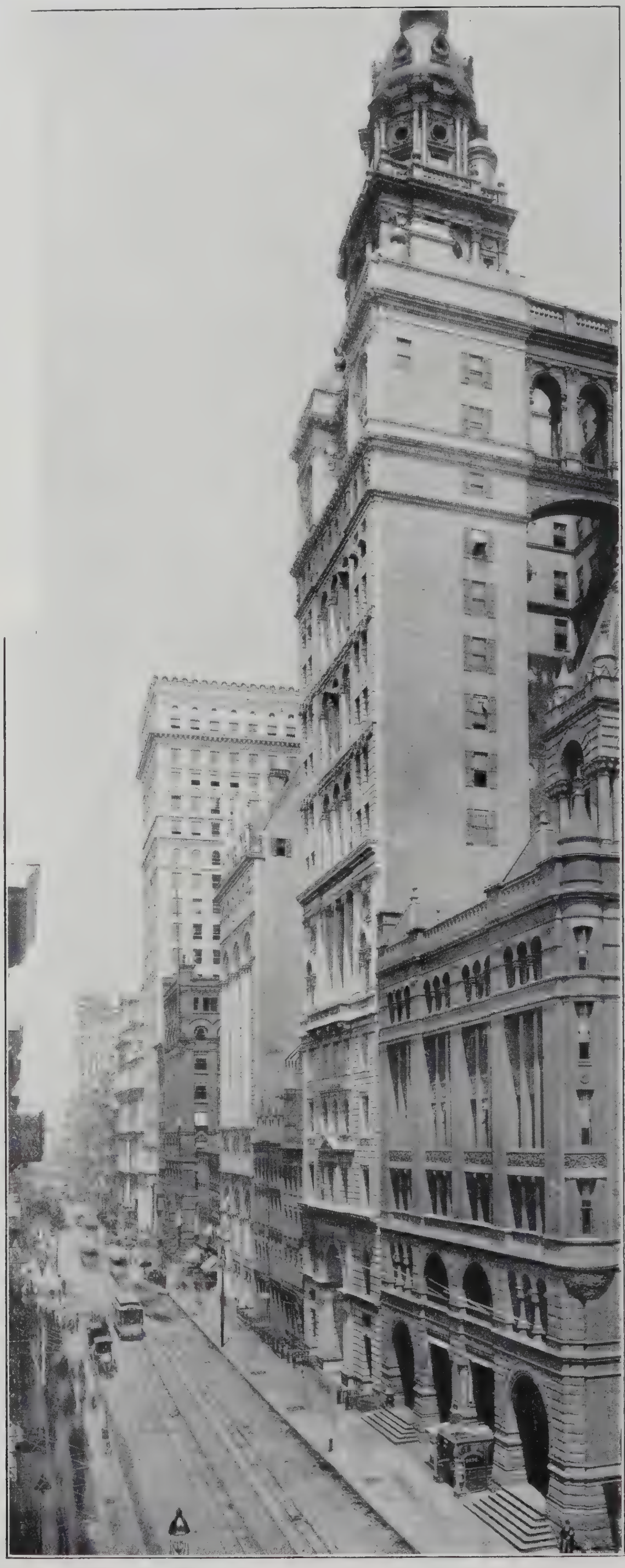
the years that have elapsed since then, his business has been one of the largest in the United States.

This business is, moreover, distinguished by the importance from a social and commercial point of view, and by the high cost of many of the buildings, as well as their extremely thorough and workmanlike construction. Many American cities have, among their most important public and mercantile buildings, the structures erected from Post's designs, and several of the most sumptuous and splendid residences in America are also his work. These buildings are appropriate and enduring, useful and worthy, and, as instanced by his late works, are not without conspicuous artistic merit. Of his earlier work, the late Russell Sturgis wrote: "That charm of conventional proportion which, in our modern practice, can only be got by the deliberate sacrifice of convenience and logic to the massing of lines of a façade, is not especially a characteristic of his compositions. On the other hand, these buildings are admitted by all to be among the best built, best planned, most useful and most truly economical of our modern structures. It is, moreover, generally admitted that this architect, more than most men in very large practice, designs his own work. Of course, the mysteries of a working office are impenetrable. No one really knows which member of the firm, or which subordinate of the many in an office of seventy or eighty employees, is really responsible for the merit or demerit of a design. We call a building the design of Smith or Brown, because Smith or Brown is the responsible man; it is he who has received the commission and who draws the percentage; but who deserves the credit or discredit of the plan, the general design, or the details, is absolutely unknown to the outside world. And yet it is not to be doubted that the architect whose work we are now considering does far more of his own original planning and designing—arranges his own studies far more thoroughly and in person—than is at all the rule. It is not many months since Mr. Post said, himself, in the course of discussion at the Architectural League, that the limit of business in his office was that of his own capacity to originate the designs—to make primary studies—and it is probable that no one of those present was inclined to dispute this saying, rash as it seems, and almost incredible, if measured by the well-known practice of many architects in a large way of business."

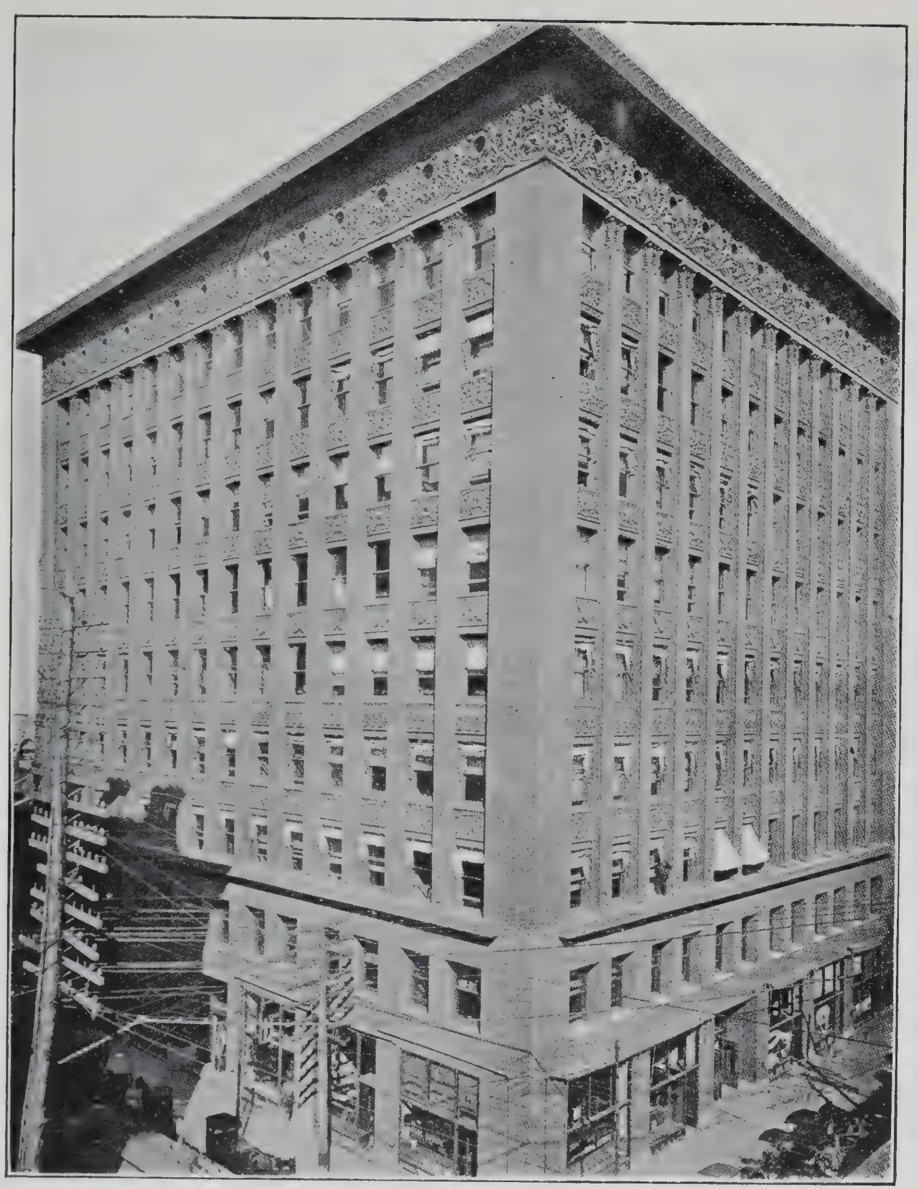
Since Mr. Sturgis wrote the above paragraph, Mr. Post has taken into partnership his two sons, Mr. William S. Post and Mr. James Otis Post, whose modern and more thoroughly artistic training has doubtless assisted greatly in the continuous improvement which has constantly been observed in Mr. Post's work since the earliest examples began to attract the attention of the American architectural profession.

To use the words "continuous improvement" might possibly suggest the idea of "damning by faint praise," and if we were to consider the earliest of Mr. George Post's work as representing in the least his present understanding of architecture, or that his work to-day were merely "improvement" over that of the period of time between the closing of the war and the opening of the Columbian Exposition, the idea might not improperly be suggested. Such, however, is far from being the fact. In few recorded instances has the existence of latent talent been so clearly proved as in Mr. Post, by his works since the days when, through association with a number of brilliant artists, his own artistic instincts were awakened.

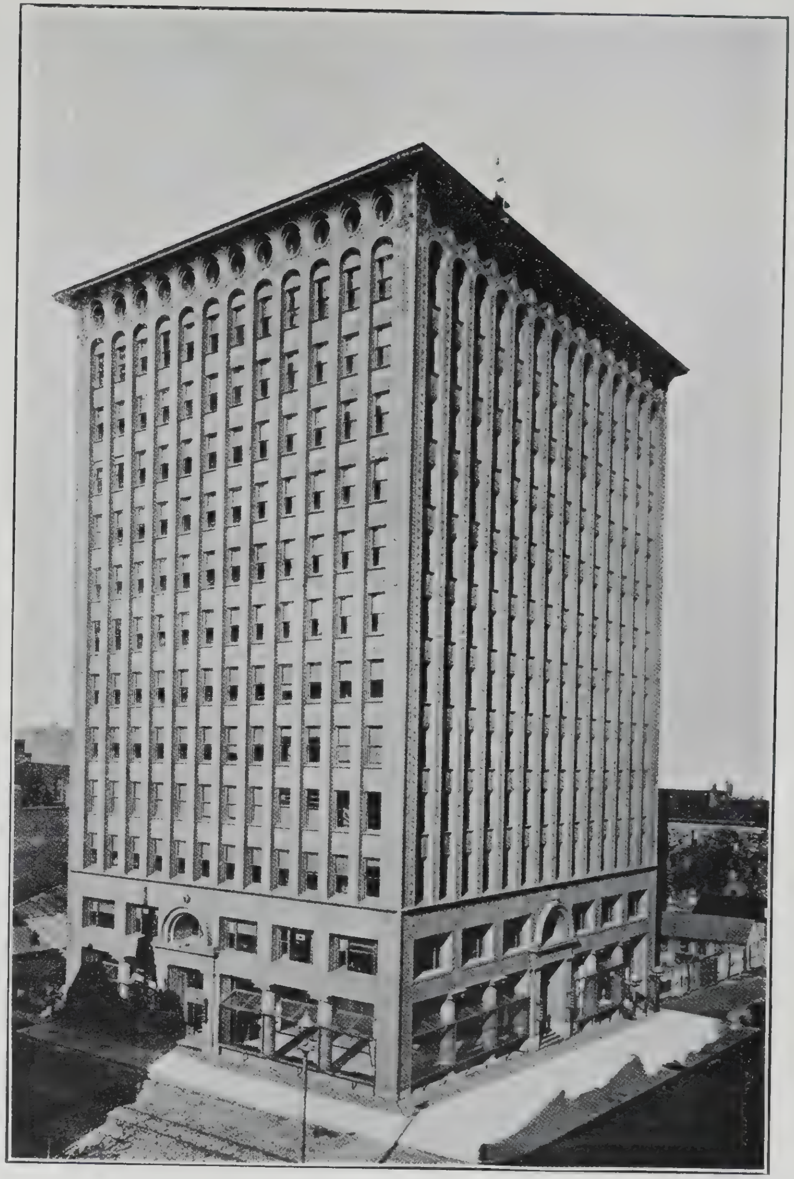
Mr. Post's work may be classified into four principal divisions as to time and style: first, his "engineering" period, when he produced the very large, important, and altogether hideous Pulitzer building, Park Row, New York, and one or two others equally unlovely; secondly,



VIEW UP BROADWAY, NEW YORK. MANHATTAN LIFE BUILDING IN FOREGROUND.

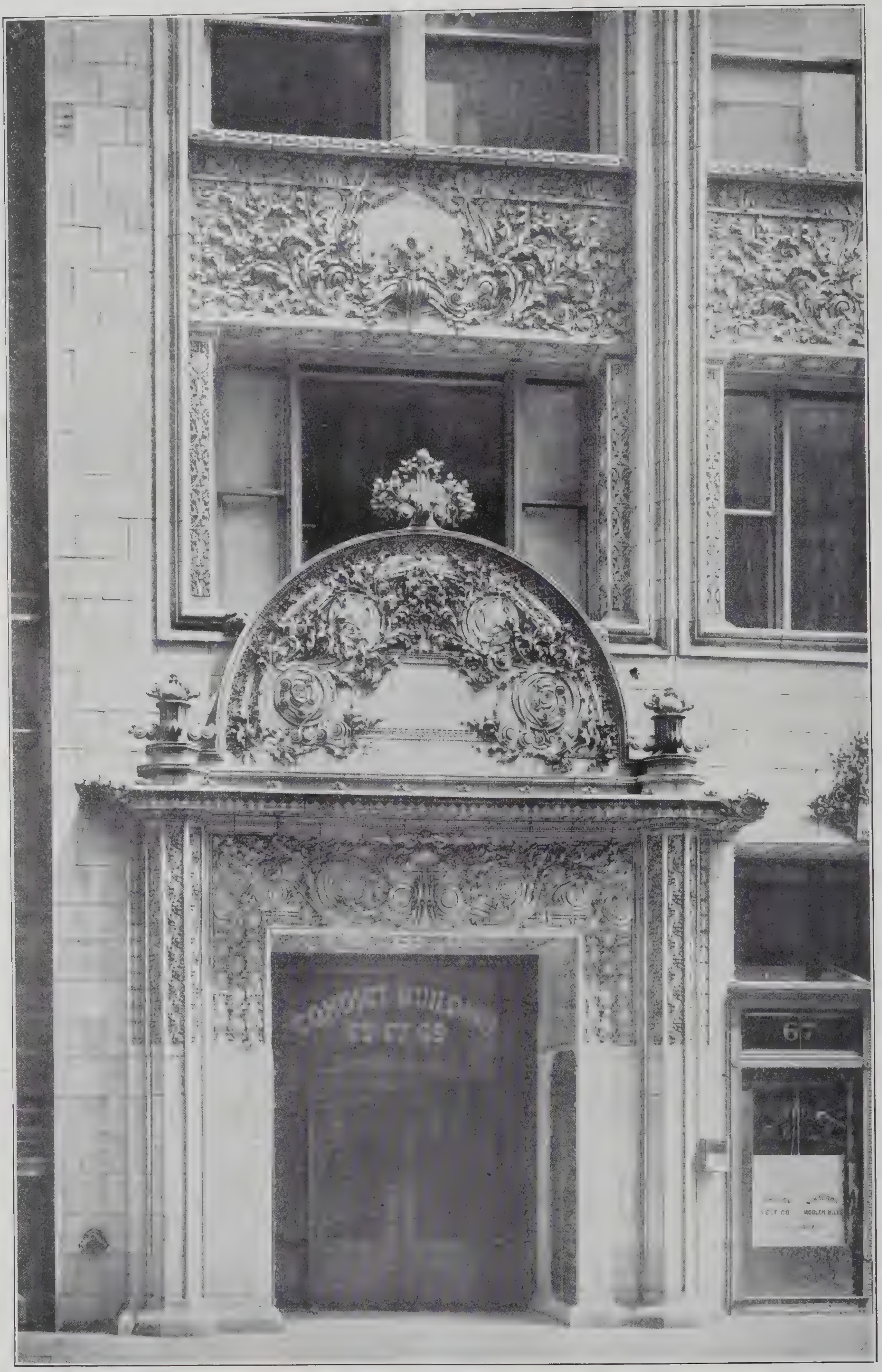


THE WAINWRIGHT BUILDING, ST. LOUIS, MISSOURI. LOUIS H. SULLIVAN, ARCHITECT.



THE GUARANTY BUILDING, BUFFALO, NEW YORK. LOUIS H. SULLIVAN, ARCHITECT.

his experimental period, when he became more interested in the beautiful side of his work and presented the Produce Exchange Building, at Bowling Green, the old "Times" building in Park Row, the Union Trust Building in Broadway, New York, the first Prudential Building at Newark, N.J., and the building of the Erie County Savings Bank at Buffalo, N.Y.; thirdly, his period of development, when he produced the Cornelius Vanderbilt town house—probably to-day the largest in New York, the Liberal Arts Building at the Columbian Exposition, the Bank of Pittsburgh, and the Park Building at Pittsburgh, Pa., and the Huntington residence in Fifth Avenue, New York; and fourthly, his period of achievement, which may be



CONDICT BUILDING, BLEECKER STREET, NEW YORK CITY. DETAIL OF ENTRANCE. LOUIS H. SULLIVAN & L. P. SMITH, ARCHITECTS.

(For Elevation, see page 540.)

said to have begun with the strong design which won the competition for the building for the Department of Justice at Washington, D.C., about ten years ago.

Of the earliest of these stages of his work, all that should be said in fairness is, that it was much better in construction, and a little better in design, than what was being done by other architects at the time—a time when architecture had almost ceased to exist in all countries boasting "Western civilisation." It was not *architecture* in the sense in which we use the word to-day; it was only good building, which grew simpler, and consequently better, as years went on. In the Produce Exchange there is a hall of great dimensions, which is wonderfully effective because of its good proportions and its simplicity of scheme. This Produce Exchange Building, and all the vigorous designs mentioned as belonging to his experimental period, show the influence of the work of Richardson, but more than this, they reflect truly the life and spirit of the times.

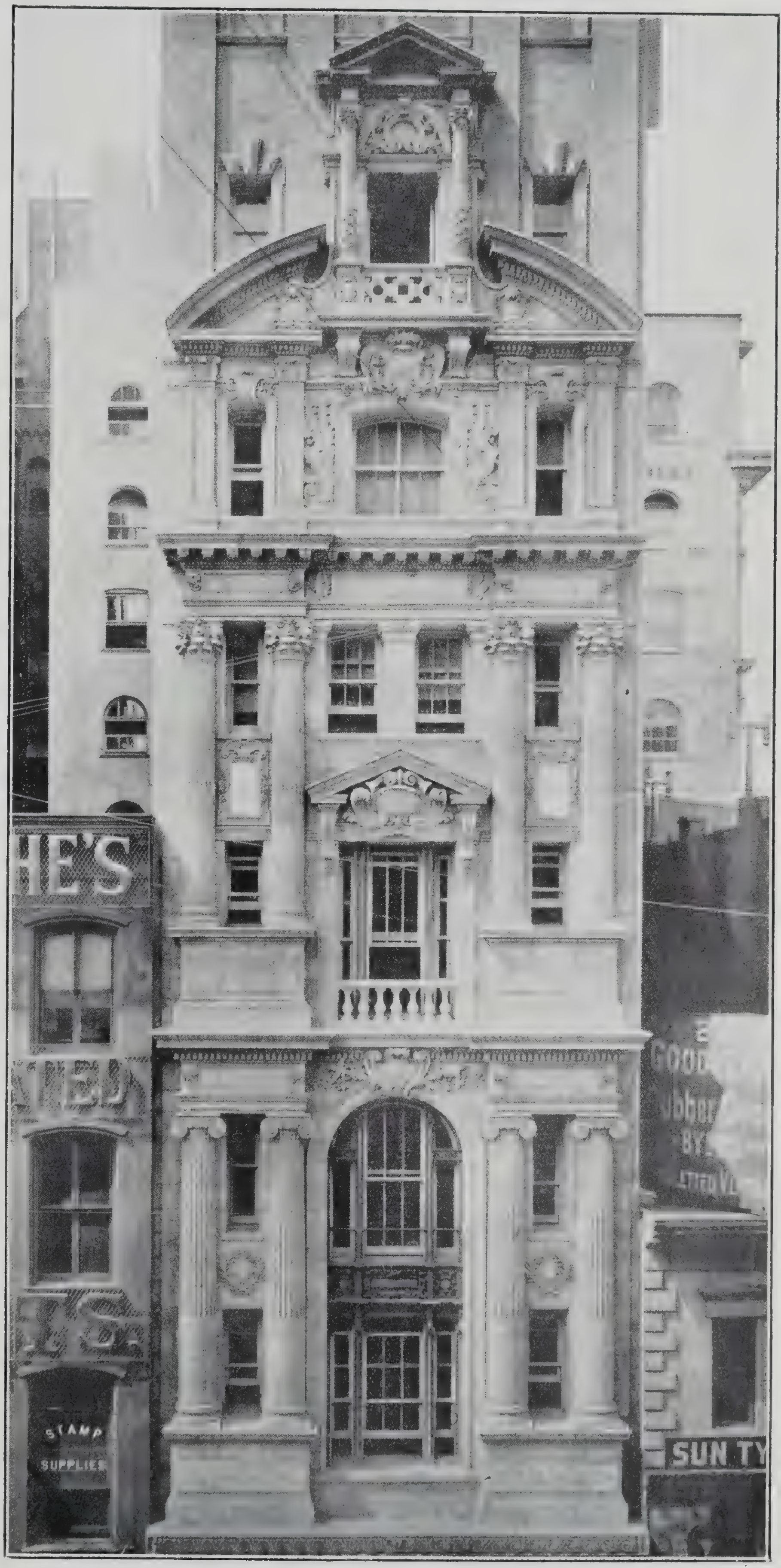
It may be said that the architects of the Columbian Exposition educated themselves at that exposition, since it is a fact that several of those who took part in the work upon that famous design had never done anything else comparable with what they did there. Mr. Post was one of the members of the Board of Architects, and architect of the Palace of the Liberal Arts—from a general point of view, perhaps the finest exposition building that has ever been built.

For several years following the exposition, Mr. Post's work was almost exclusively the commercial class—the gigantic office building being his portion—and with this class of work he kept busy a large number of draughtsmen. But enthusiasm on the artistic side of his profession had been much developed by his experience upon the work at Chicago. Association with such artists as Hunt, McKim, Burnham, Atwood, and Saint Gaudens, had aroused his deep interest in the arts, and especially in monumental architecture, of which his first remarkable study was the successful competitive design for the Department of Justice at Washington—above mentioned. This Department of Justice design is a scholarly study in architecture, at once classic, modern, and distinctively American. Several of Mr. Post's buildings are illustrated on pages 546, 552, 561, 589, 595, 602, and 603.

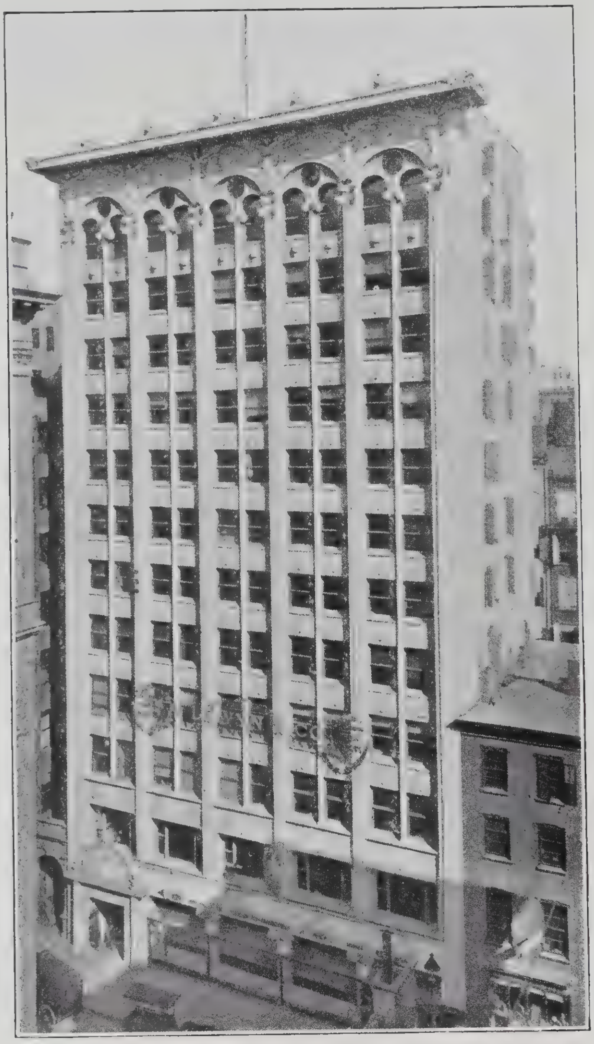
Mr. D. H. BURNHAM, OF CHICAGO.

Daniel Hudson Burnham, probably now the foremost of American architects, was born at Henderson, Jefferson County, New York, September 4th, 1846. He is a grandson of Samuel Hopkins, of Vermont, who made himself famous in the war for American Independence. In the year 1855 his family moved to Chicago, which was then a mere border town of a few thousand inhabitants. In the year 1864 he commenced his architectural studies in Massachusetts; and in 1867 returned to Chicago and entered the office of Messrs. Loring and Jenney, where he received his first eighteen months' professional experience. In October, 1871, he was engaged by Messrs. Coster, Drake, and Wright, in the rebuilding of the city which followed the great fire. Those were not days of monumental city planning, and the refinements of life are not the first things to be thought about after a great catastrophe. The buildings first erected were only a stage in advance of those which had been just burned down—the advance was in engineering rather than architecture; the buildings were better designed as regards construction, and perhaps also as to means of escape in case of fire, but it was not until some years later—one might say at least not until after the Centennial Exposition of 1876, held at Philadelphia—that the idea of building beautifully—for effect as well as strength—took hold of the people of Chicago.

In 1873 Mr. Burnham and John Wellborn Root commenced the practice of architecture under the firm name of Burn



"MAIL AND EXPRESS BUILDING, NEW YORK. BROADWAY FRONTAGE DETAIL.
CARRÈRE & HASTINGS, ARCHITECTS.

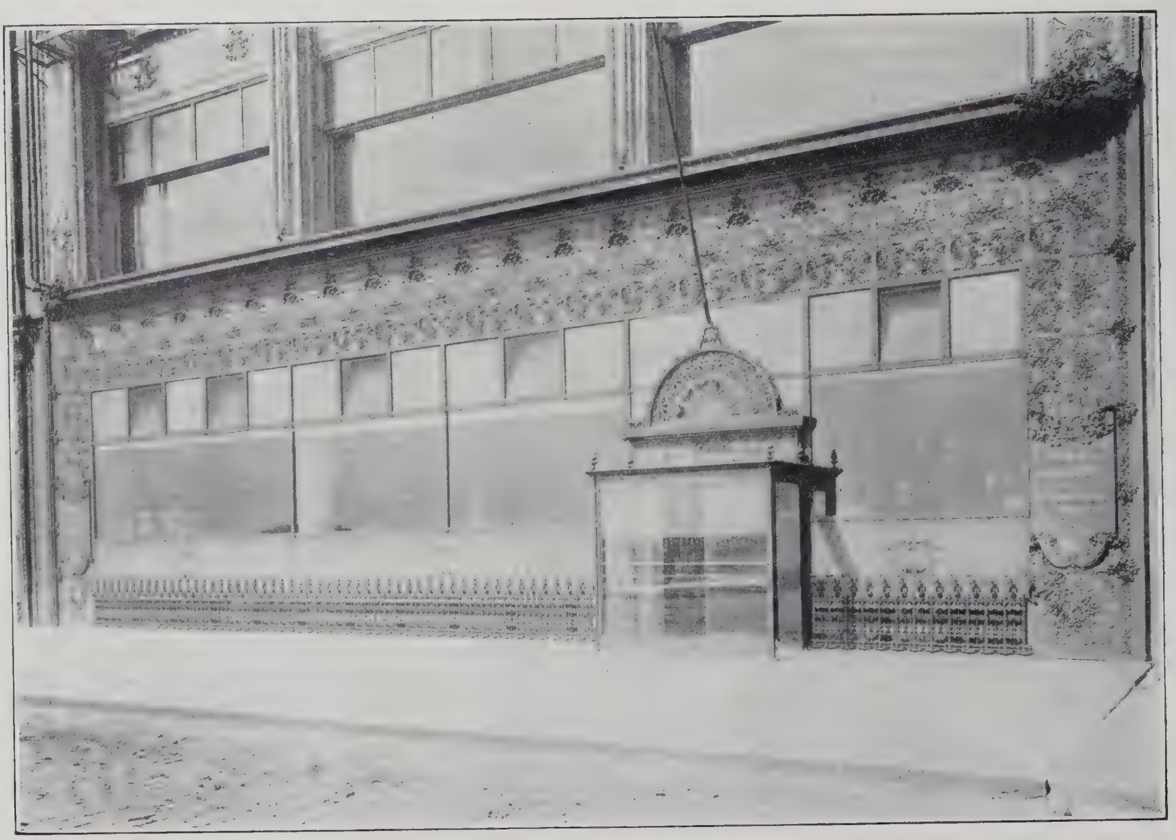


CONDICT BUILDING, BLEECKER STREET, NEW YORK. LOUIS H. SULLIVAN, ARCHITECT.
(For Detail, see page 538.)

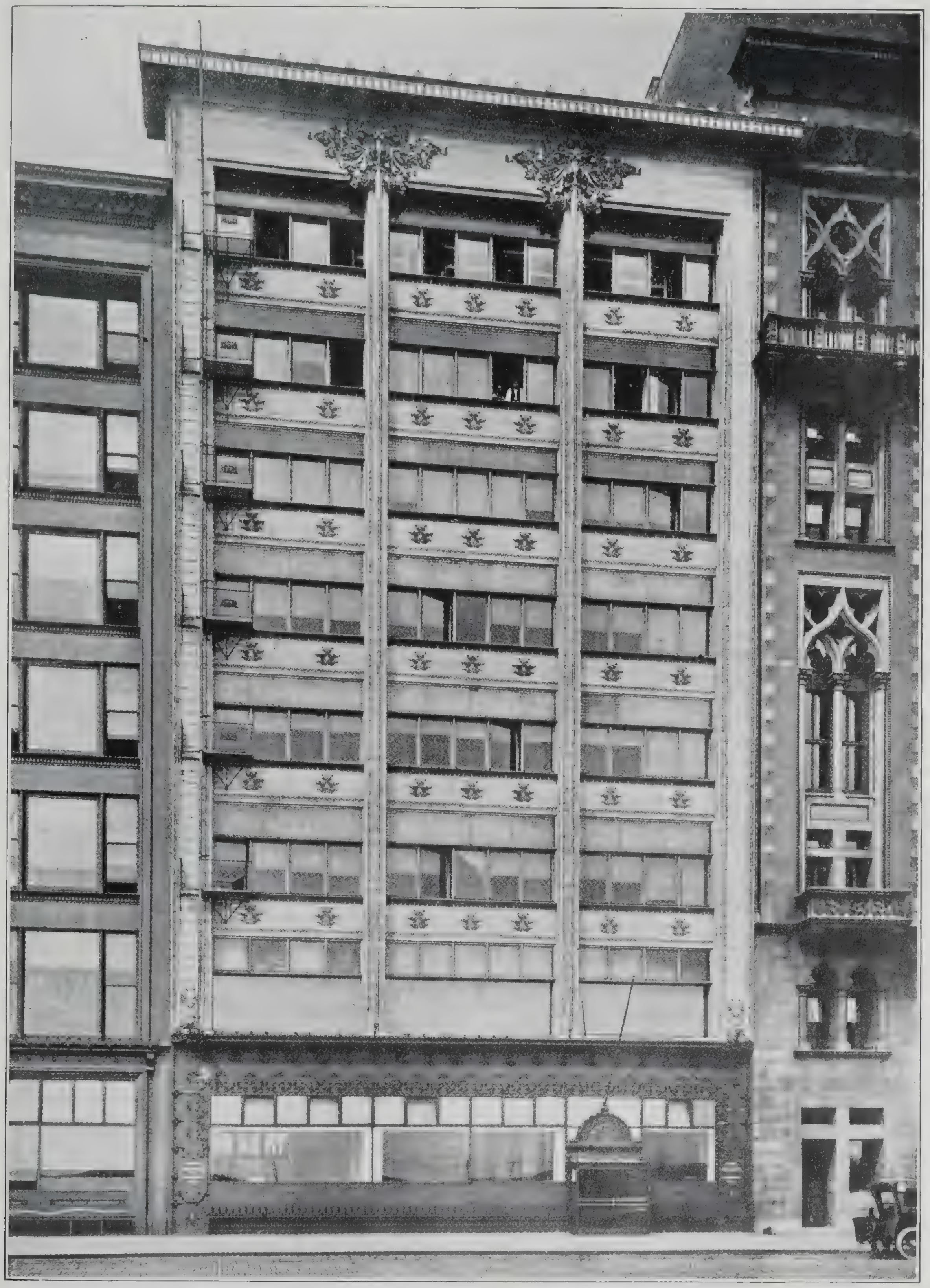
ham and Root. An examination of their very early work reveals only undeveloped—but developing artistic ability, and their later work, such as the "Chicago Herald" building and the Monadonock office building, the twenty-storey Masonic Temple, and the building of the Women's Christian Temperance Union, all of which designs were well in advance of what was being done by their contemporaries, though proving artistic perception in their designers, were all expressed through the medium of a style little suited to the orderly and rather Latin taste of Mr. Burnham. The Monadonock, though a plain commercial structure—absolutely unornamented—attracted much attention on the part of the public and "the profession" alike, because of its good proportions and excellent lines, and may be said to be the first evidence of classic taste in the design of office building structures.

The earliest architectural development of Chicago is centred in the work of these two men.

The beginnings of modern American architecture may be said to have taken place when in September, 1890, Messrs. Burnham and Root were appointed "constructing architects of the Columbian Exposition," and a month later Mr. Burnham was made Chief of Construction. The following January Mr. Root, who had been studying the design while Mr. Burnham was busy organising the construction department, died, and Mr. Burnham was appointed Director of Works, with sole responsibility for the artistic and practical result of the whole work connected with the buildings and grounds. It was due principally, if not entirely, to his efforts during the period of inception, that the arrangement was made to place a Board of Architects in control of the scheme and assign the separate buildings to different architects. This Board of Architects included most of



SHOP-FRONT, GAGE BUILDING CHICAGO. LOUIS H. SULLIVAN, ARCHITECT.



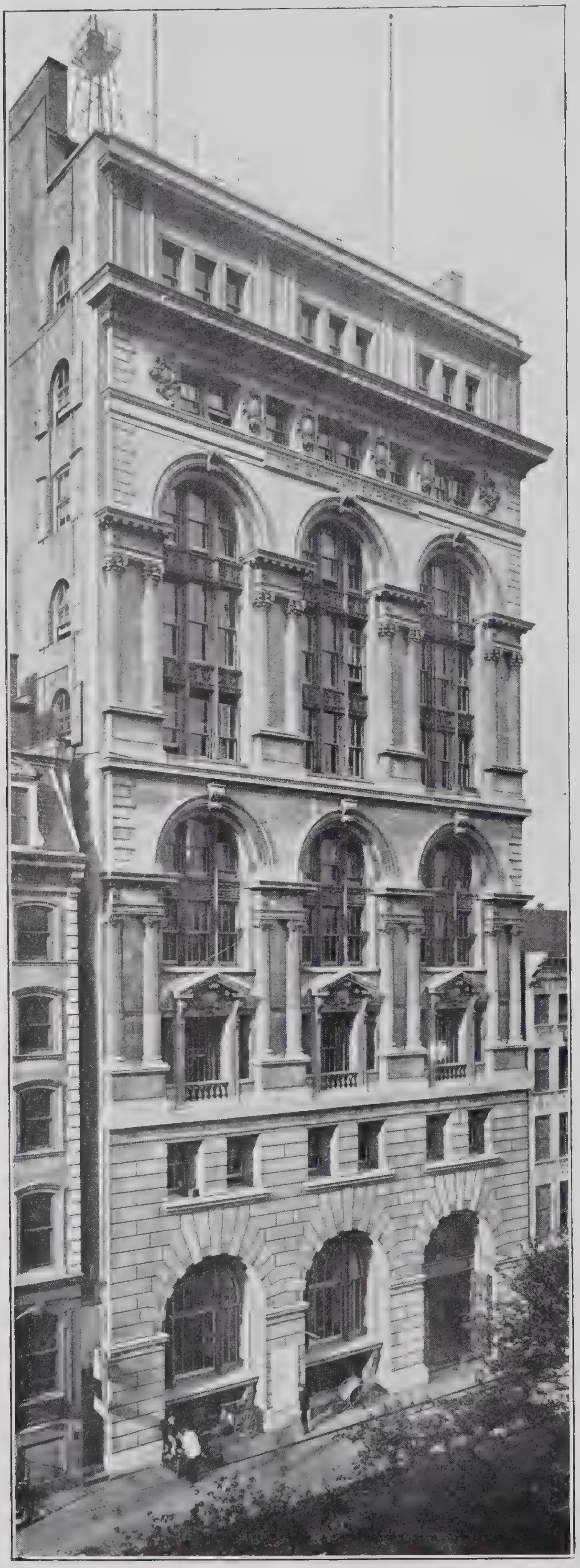
GAGE BUILDING, CHICAGO. LOUIS H. SULLIVAN, ARCHITECT.

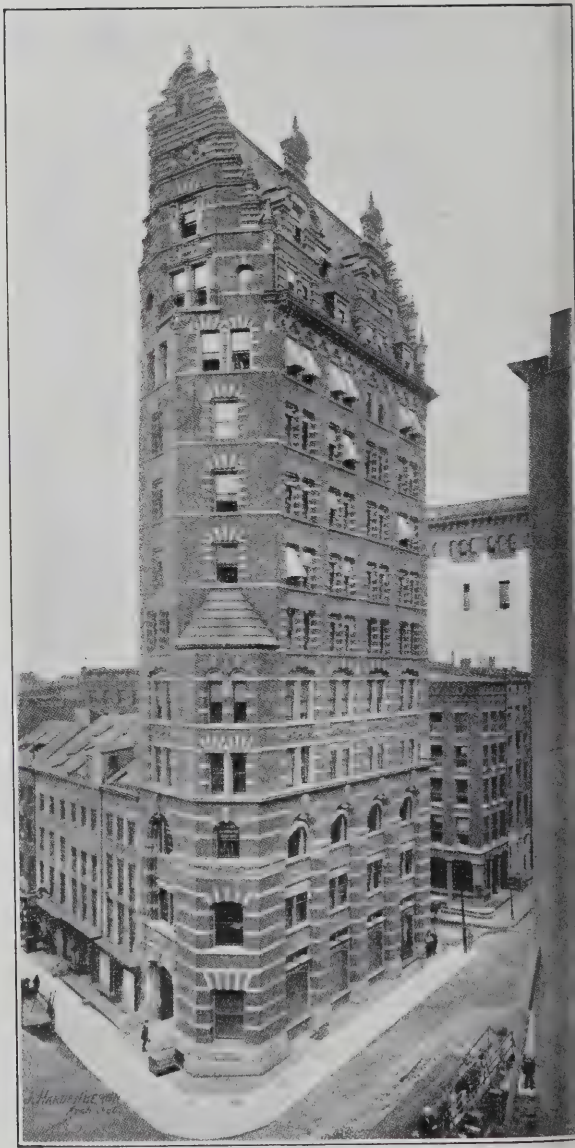
the conspicuous artistic talent of the day—two of its members, the late Richard Morris Hunt and the late Charles Follen McKim, were the only Americans who have ever been presented the Royal Gold Medal of the R.I.B.A.—McKim, with his partners Mead and White, Messrs. Peabody and Stearns, the late Dankmar Adler and Mr. Louis Sullivan, Mr. Geo. B. Post, the late Henry Van Brunt, and Mr. Howe, the late W. L. B. Jenney, Mr. Solon S. Beman and the late Charles Bowler Atwood. The last-mentioned was chosen by Mr. Burnham to become his chief assistant, and later taken into partnership. Mr. Ernest Graham, another assistant renowned for executive ability, was made Assistant Director of Works, and afterwards a partner. In thus drawing about him the ablest and most influential members of his own profession, and putting in their hands the check upon his own ideas and undertakings, Mr. Burnham displayed a diplomatic skill for which he has always since been distinguished—not only among architects, but when dealing with the great "captains of industry," "masters of finance," "railway magnates," and able politicians with whom he has been in constant contact since the days when the Exposition was first projected. To an acquaintance he was once described, by a late United States Senator, as "a great artist, a great engineer, a great organiser, and a great diplomat." When this was repeated to an engineer who had worked with Mr. Burnham during the Exposition days, the reply was even more pleasantly interesting: "He has a cold head and a warm heart, which never mix, but are always in touch with each other. In meeting him I always felt a thin sheet of ice was between us, but a generous man on the other side." These are the sort of things one sometimes hears said of a prominent man after his demise—and then usually by his personal friends—but the above comments were made by men who knew Mr. Burnham in business only, to another who they knew had at that time met him but once.

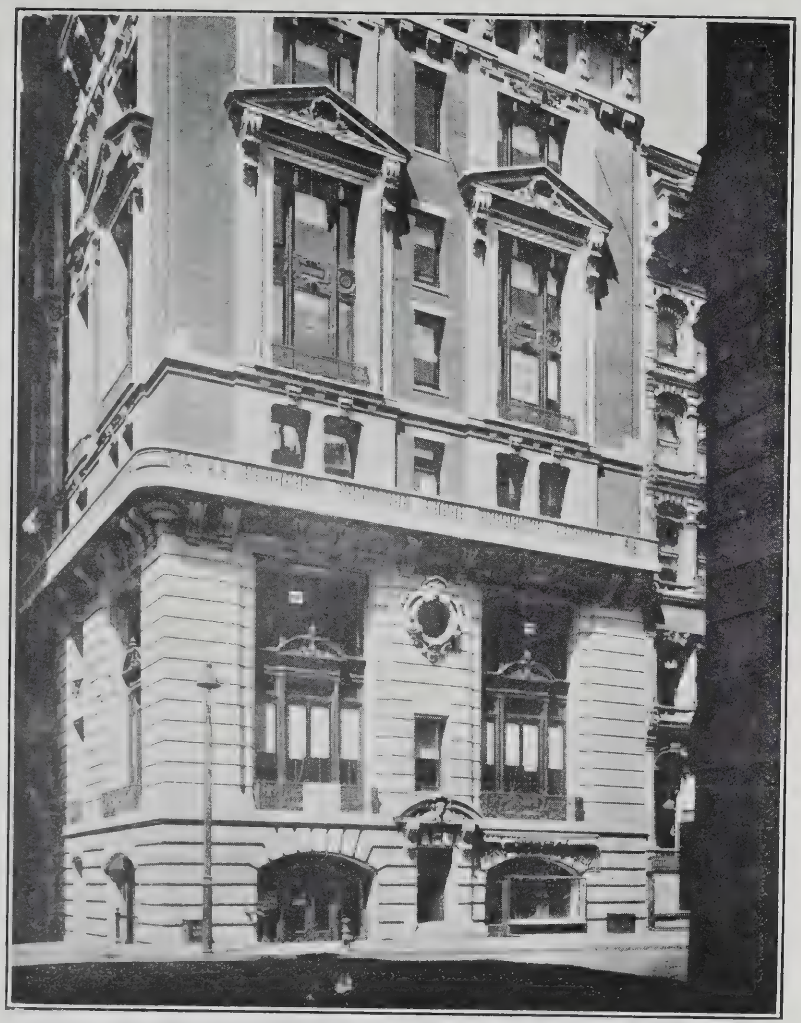
The reason the better characteristics of prominent men are not more frequently mentioned—except, of course, during after-dinner speeches—is doubtless due to fear on the part of their acquaintances of hurting the susceptibilities of the subject. But when that subject is separated from the writer by a distance of about one-quarter round the world, one may put it in its true perspective with sufficient propriety.

The Columbian Exposition brought together not only the best architects, but also sculptors, painters, engineers, "landscape architects," and workers from all over the United States. Perhaps no other Exposition anywhere ever aroused such widespread interest, such sectional pride, or such local enthusiasm. This was a monument to commemorate the four-hundredth anniversary of the discovery of America, a memorial to the peaceful progress of the American people, a milestone marking the course of development of the great "Middle West," the "Coming-out reception of Chicago."

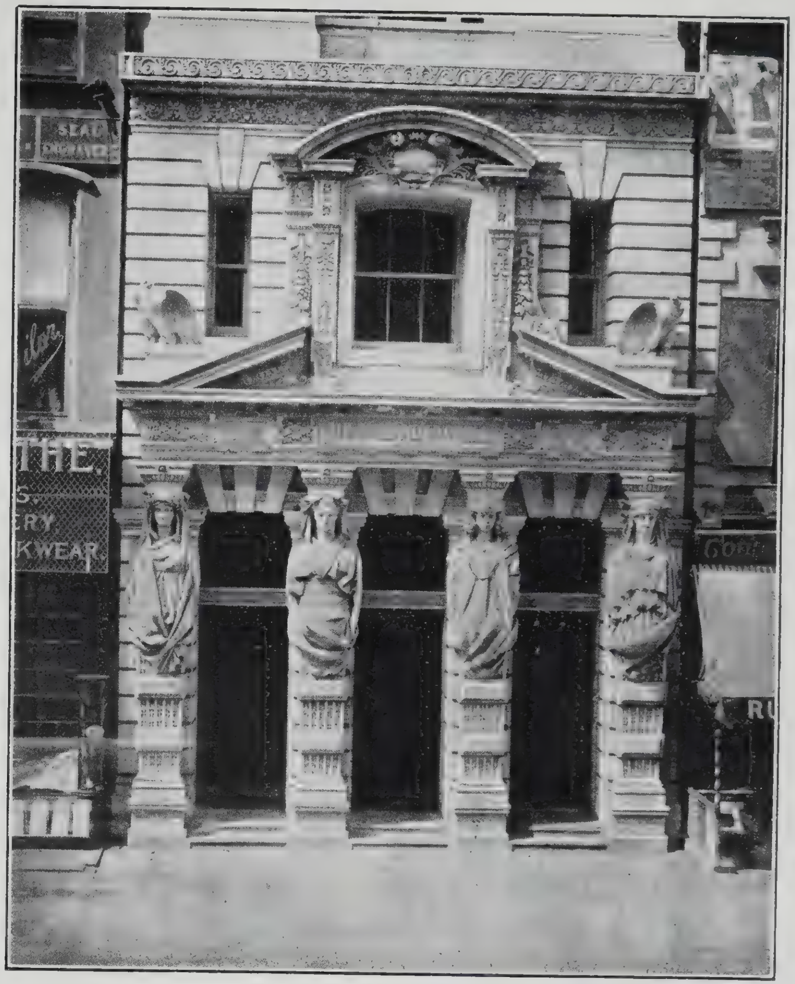
One of the most disastrous conflagrations of modern times had swept the city of Chicago out of all but existence only twenty-one years before, and its rebuilding had gone on amidst national financial panic, wild struggles with a semi-organised and desperate anarchy, which was insidiously sapping the mind and energy of local labour, and in the face of lack of faith in its enterprises on the part of investors in the Eastern States. Chicago was spoken of as the "city of slaughter-houses," of "pork packers," "the city of magnificent prairies"—alluding to the numerous spaces unbuilt upon—and otherwise generally slurred. But in 1893, when the Columbian Exposition was thrown open to the world, everybody who could journeyed thither, and the real Chicago began to be known. Her enterprise, her ambition—to be larger than


"MAIL AND EXPRESS" BUILDING, NEW YORK CITY: FULTON STREET FRONT. CARRÈRE AND HASTINGS ARCHITECTS.

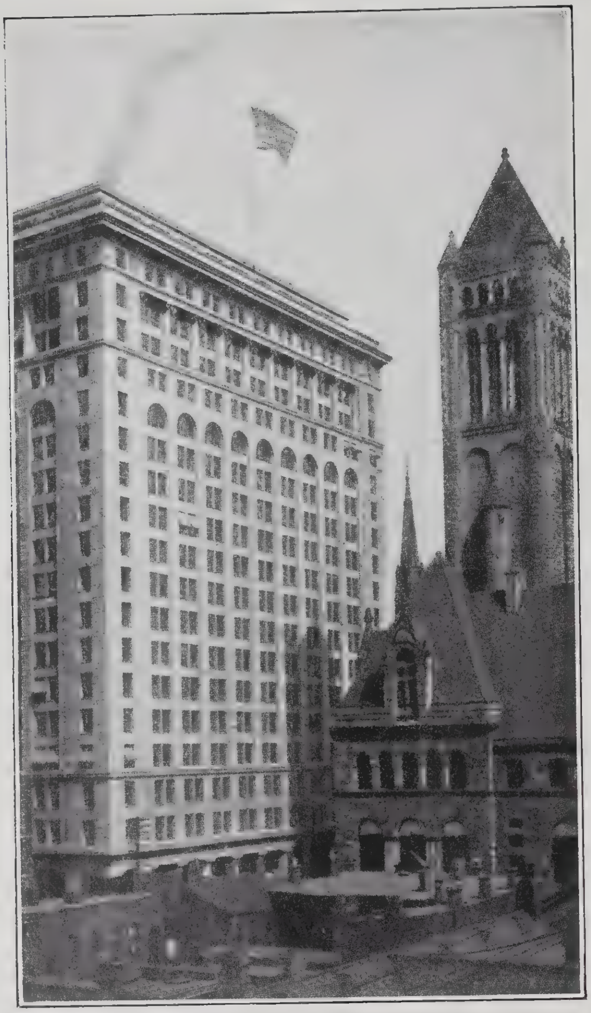

WOLFE BUILDING, WILLIAM STREET AND MAIDEN LAN
NEW YORK CITY. H. S. HARDENBURGH, ARCHITECT



THE SINGER BUILDING, NEW YORK CITY. DETAIL. ERNEST FLAGG, ARCHITECT.



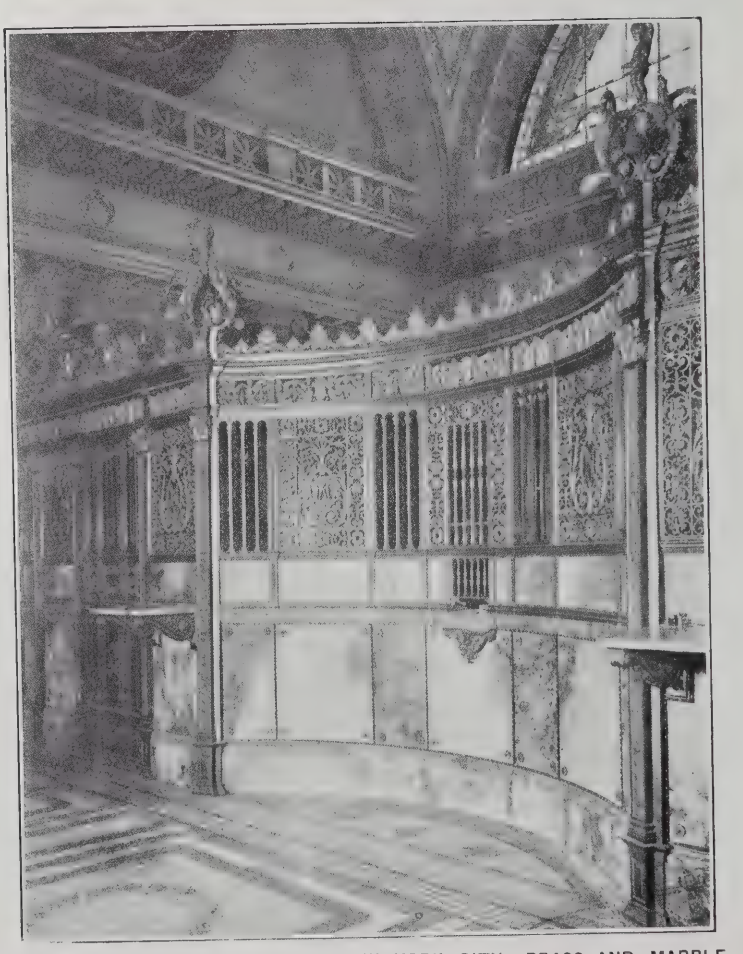
"MAIL AND EXPRESS" BUILDING, NEW YORK CITY. DETAIL, LOWER PART BROADWAY FRONT. CARRÈRE AND HASTINGS, ARCHITECTS.



THE FRICK BUILDING, PITTSBURG. D. H. BURNHAM AND CO., ARCHITECTS.

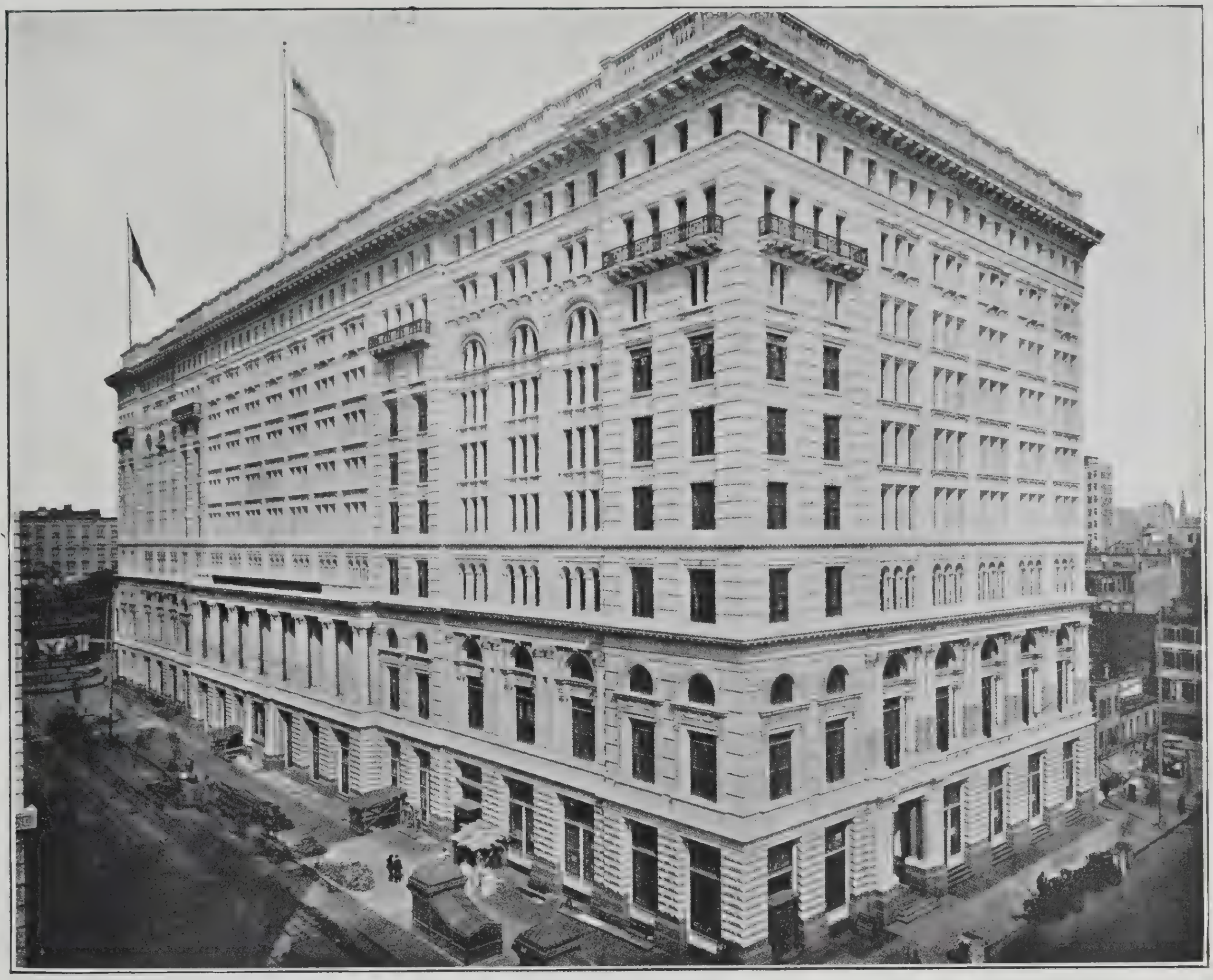
London and more beautiful than Paris—her great optimism and her financial solidity, became subjects of world-wide discussion. And to-day in Europe, whenever Chicago is mentioned, the great "World's Fair" becomes a topic of conversation. The immediate influence which the Exposition had upon the architecture of the country is too well known to require more than mention of it here. As the mainspring—we might say—of the effects produced by that Exposition, the name of Burnham is permanently associated with it—with one of the greatest architectural achievements of modern times. It is worthy of note that aside from his mere honorarium, which did not refund his expenses, the Director of Works did not profit financially from any work connected with the Exposition, but devoted his time to the undertaking, as though he had been a paid servant of the Exposition Company. When the buildings of the Exposition were completed, a public dinner was tendered to the chief architect in New York, given directly to the man whose genius had been the guiding force, and as a grateful recognition of his services. At this dinner were gathered as hosts a notable company of men highest in all the arts. On no occasion previously had a member of the artistic profession been so honoured, publicly, in the United States.

Harvard University recognised the importance of his labours by conferring upon him the honorary degree of Ph.D. The following year he was elected President of the American Institute of Architects, and was re-elected in 1895, and following his second term was elected a Director of the Institute for three years.

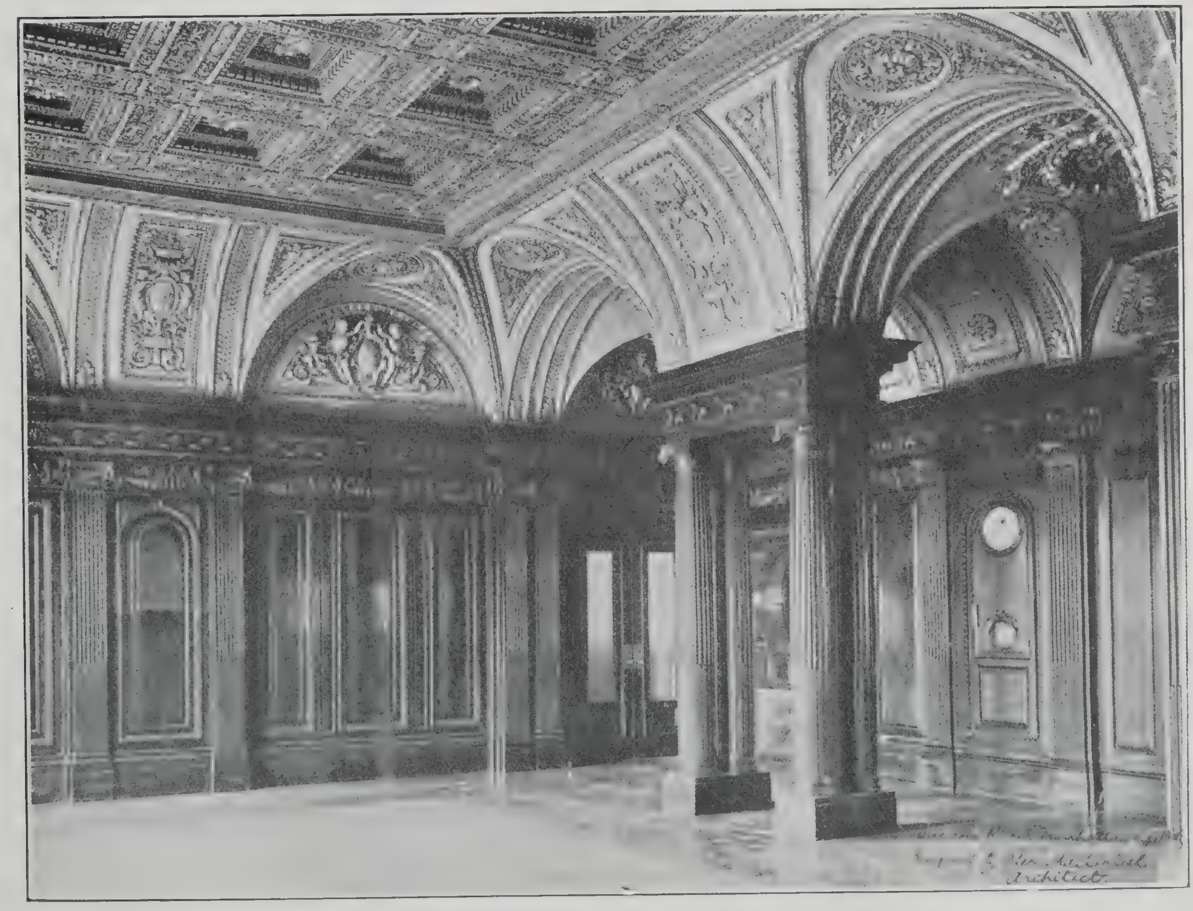


MANHATTAN LIFE BUILDING, BROADWAY, NEW YORK CITY. BRASS AND MARBLE SCREEN. KIMBALL, THOMPSON, AND MACKINTOSH. ARCHITECTS.

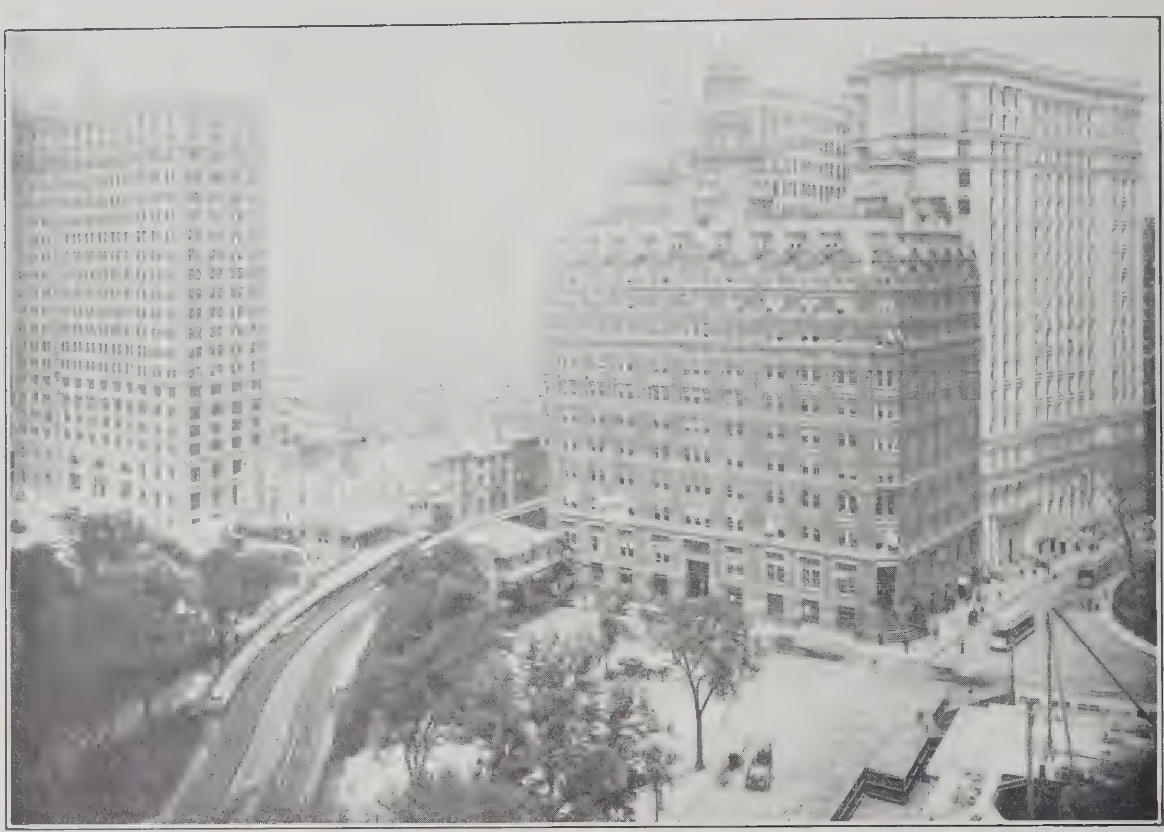
The Exposition over, Mr. Burnham returned to his large private practice, already one of America's most distinguished architects. But still greater tasks to perform for his profession and his country awaited him in the not distant future. For a few years continuously, and more or less ever since, he has been obliged to devote himself principally to conducting the architectural work of such commercial undertakings as the Ellicott Square Buildings, Buffalo, N.Y., Fisher Building and Great Northern Hotel annex in Chicago, Youngstown (Ohio) Bank, the Illinois Trust Company's Building, Chicago (p. 564), the Pennsylvania Railroad Station at Columbus, Ohio, the Marshall Field Retail Stores, the Land Title and Trust Company's buildings at Philadelphia, the Majestic Building at Detroit, the Traction Building at Cincinnati, the Union Trust Building at Pittsburg, the Continental Building at Baltimore, the Mills Building at San Francisco, the "Flat Iron" Building, New York (p. 533), the Frick Building and the Pennsylvania Railroad Station at Pittsburg (p. 544), the first National Bank of Chicago, Keith's Theatre and the Wanamaker Stores at Philadelphia, the Real Estate Exchange, Chicago, the Wanamaker Store at New York, the Ford Building at Detroit, the Commercial National Bank at Chicago (p. 559), the First National Bank of Pittsburg (p. 563), the People's Gas Company Building at Chicago (p. 578), and Gimbel Brothers' Store in New York City, the two latter being at present in course of construction. His first columnar design for the Selfridge Building in Oxford Street was perhaps the finest design that has yet been made for a commercial structure, and a subsequent re-study—made after a re-study of the original design had been made by another architect in London—was shown two years



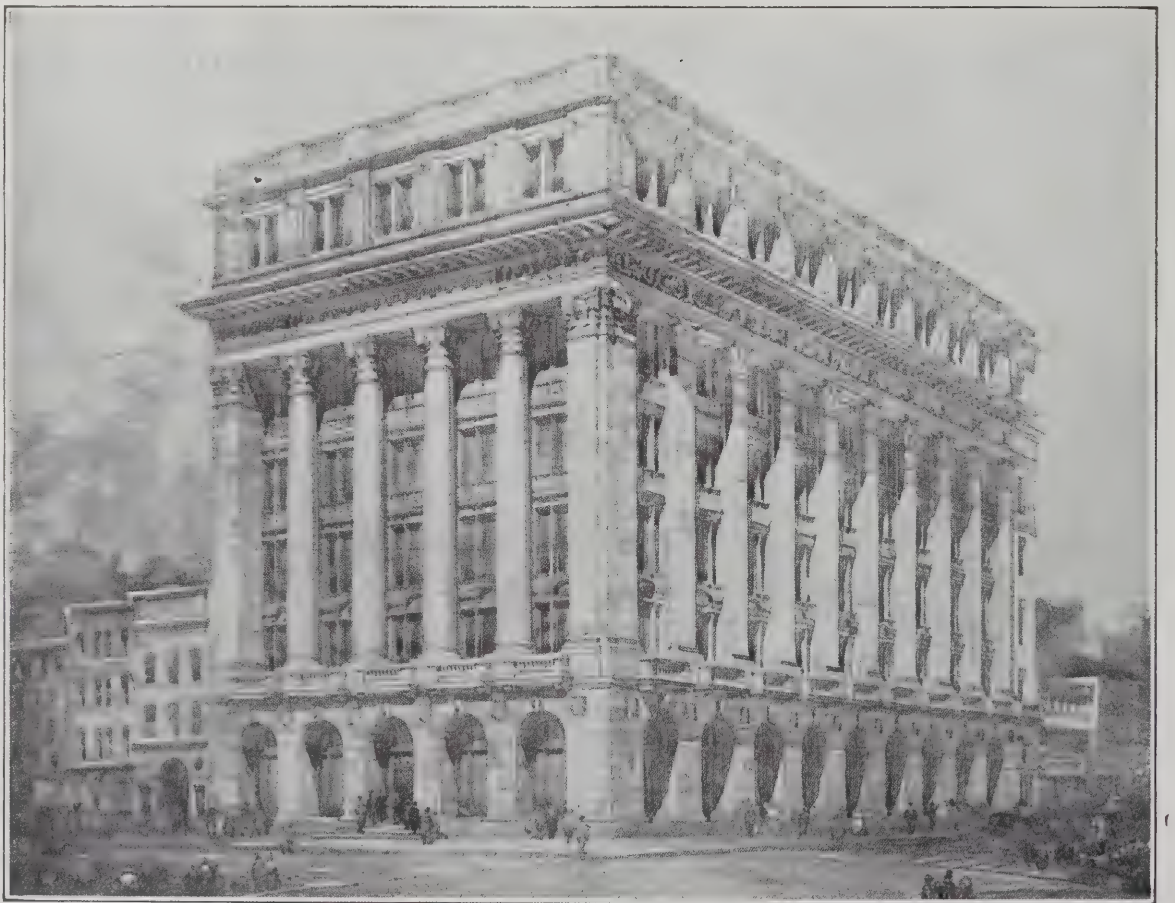
METROPOLITAN LIFE INSURANCE CO.'S BUILDING, MADISON AVENUE, TWENTY-THIRD STREET, AND FOURTH AVENUE, NEW YORK CITY.
N. LE BRUN AND SONS, ARCHITECTS.



MANHATTAN LIFE BUILDING, 66, BROADWAY, NEW YORK CITY. DIRECTORS' ROOM, KIMBALL, THOMPSON, AND MACKINTOSH, ARCHITECTS.



BUILDINGS BY BATTERY PARK, NEW YORK CITY.



MUTUAL LIFE INSURANCE COMPANY BUILDING, NEWARK, NEW JERSEY. GEO. B. POST, ARCHITECT.

THE HOWARD SAVINGS INSTITUTION, NEWARK, NEW JERSEY. GEORGE B. FOST AND SONS, ARCHITECTS.

ago at the Royal Academy by means of a large beautifully rendered water-colour drawn by Mr. Lawrence Buck, of Chicago (p. 579). This has been somewhat modified in execution.

It is probable, however, that with the exception of the bank buildings solely devoted to banking, none of these great commercial structures appeal very strongly to Mr. Burnham's æsthetic sense. His great design for the Field Columbian Museum at Chicago seems to be more to his feeling for architecture. It may be classed with the New York and Boston Public Libraries among the very best of American architectural productions. Another work almost as fine and equally important is the great Union Station at Washington, D.C., which arose out of Mr. Burnham's action as a patriotic American citizen in asking a railroad company to give up certain of its rights in the interests of the beauty of the nation's capital, in the planning of which Mr. Burnham has taken part second only to Major L'Enfant, who made the original plan.

Plan of Washington.

In March, 1901, the Senate of the United States "Resolved that the Committee on he District of Columbia be, and it is hereby, directed to consider the subject and report to the Senate plans for the development and improvement of the entire park system of the District of Columbia. For the purpose of preparing such plans, the Committee may sit during recess of Congress, and may secure the services of such experts as may be found necessary for a proper consideration of the subject," etc.

About a fortnight later the sub-committee having the matter in charge met the representatives of the American Institute of Architects, and agreed to the proposition of the latter that Mr. Burnham and Mr. F. L. Olmstead, jun., be employed as experts, with power to add to their number. These gentlemen accepted the task, and subsequently invited Mr. McKim and Augustus St. Gaudens to act with them. Mr. Burnham was elected Chairman of this Expert Committee.

At the call of their professional brethren, and at the request of this committee, these men virtually put aside their large and profitable private work, and for nearly a year devoted their time, their experience, and their technical training to the service of the nation. These sacrifices were made without pecuniary reward, and at a time when success and fame were already secure.

The work done by this committee resulted in the adoption of a plan following closely the original plan made by Major Pierre Charles L'Enfant in 1791, its object being to prepare for the City of Washington such a plan as should enable future development to proceed along the lines originally planned—namely, the treatment of the city as a work of civic art—and to develop the outlying parks as portions of a single well-considered system.

After detailed examination of the topographical features of the District of Columbia, the Commission drew up preliminary plans. They were then forced to the conclusion that an adequate treatment of the park system depended upon the exclusion of the Baltimore and Potomac Railroad from public grounds, so as to allow that dignified approach to the Capitol for which the Mall was originally designed. The occupation of the Mall by the railroad dated back to 1872, when it was granted by the then local government of the District of Columbia and confirmed by Congress. The railroad therefore held the right to use the property by a title good in law and equity, and by virtue of a later Act of Congress the railroad space had been enlarged in consideration of the surrender of street trackage and the proposed elevation of tracks in the City of Washington.

Mr. Burnham was architect of the Pennsylvania Railroad's new station at Pittsburg, and he had also drawn for the Pennsylvania Railroad the preliminary plans for the then proposed new Baltimore and Potomac station in the Mall site. He went to the President of the Pennsylvania and asked that the station be built on the south side of the Mall and lands adjoining. The architectural and other advantages of the proposed site were set forth with such vigour as to command serious consideration.

During the summer (1901), Mr. Burnham, with other members of the Commission, made a brief trip to Europe, and while here—in London—President Cassatt, of the Pennsylvania, announced to him his willingness to consider the question, not of moving the station to the south side of the Mall, but of withdrawing altogether from that region and uniting with the Baltimore and Ohio Railroad Company in the erection of a Union Station, provided suitable legislation were secured to make compensation for the increased expense such a change would involve, and provided also that the approaches to the new site be made worthy of the building the railroads proposed to erect.

The Commission proposed a site on Massachusetts Avenue, which was finally accepted by the railroad companies. Mr. Burnham was charged with the designing of the new station, which was intended to be superior to any structure ever erected for railway purposes.

It is seldom, even in these days of town planning—or talk of it!—that an architect charged with the planning of a city, but to have planned two or three capital cities surely must be a record. Such, however, has fallen to the lot of Mr. D. H. Burnham.

The Plan of Manila, Philippine Islands.

In 1898 differences between the United States and Spain resulted in the acquisition of the Philippine Islands by the former. No sooner had these islands come into the possession of the United States than the War Department set about adapting the capital city of Manila to the changed conditions brought about by the influx of Americans who are accustomed to better conditions of living than had prevailed in the Philippines. In 1905, Mr. Burnham, assisted by Mr. Pierce Anderson, was instructed by the Secretary of War (the Honourable William H. Taft, since President of United States) to visit the city of Manila and prepare a report and plans for the future improvement of the city and harbour. The report was completed on June 28th, 1905. It deals briefly with the history and general conditions prevailing, political, topographical, building, and population. It was accompanied by two plans—the plan of Manila, showing proposed improvements, and plan of Manila Bay, showing a proposed sea boulevard.

The aim of the proposed plan is stated to provide :—

(1) Development of water front and location of parks and parkways, so as to give proper means of recreation to every quarter of the city.

(2) The street system, securing direct and easy communication from every part of the city to every other part.

(3) Location of building sites for various activities.

(4) Development of waterways for transportation.

(5) Summer resorts.

The proposed development of the water front includes the construction of an ocean boulevard or continuous parkway along the bay to the south side of the city; planted drives along the shores of the river, which runs, approximately, east and west, and divides the city into halves; a new Luneta—or island pleasure park—formed upon made ground in the shallow part of the harbour, parks, parkways, playgrounds, gardens, and fountains.

The street system deals with the sanitation of the old quarter, and attempts to connect it with the ideal plan proposed for the future extension of the city, that the existing streets, bridges, and harbour works may be left substantially unchanged, and no demolition of buildings or changes in the direction of streets are suggested, except such as were imperatively called for to relieve present congestion and provide for the future needs of traffic. It also considers carefully the advantages and disadvantages connected with the old city walls, and recommends their retention, suggesting the cutting of arches through same to allow the extension of streets. It also proposes that the old moat shall be filled in, and treats scientifically the problem of the width of streets. Of the street system in the new quarter, it provides :

Avoidance of either north or south or east and west orientation of building sites.

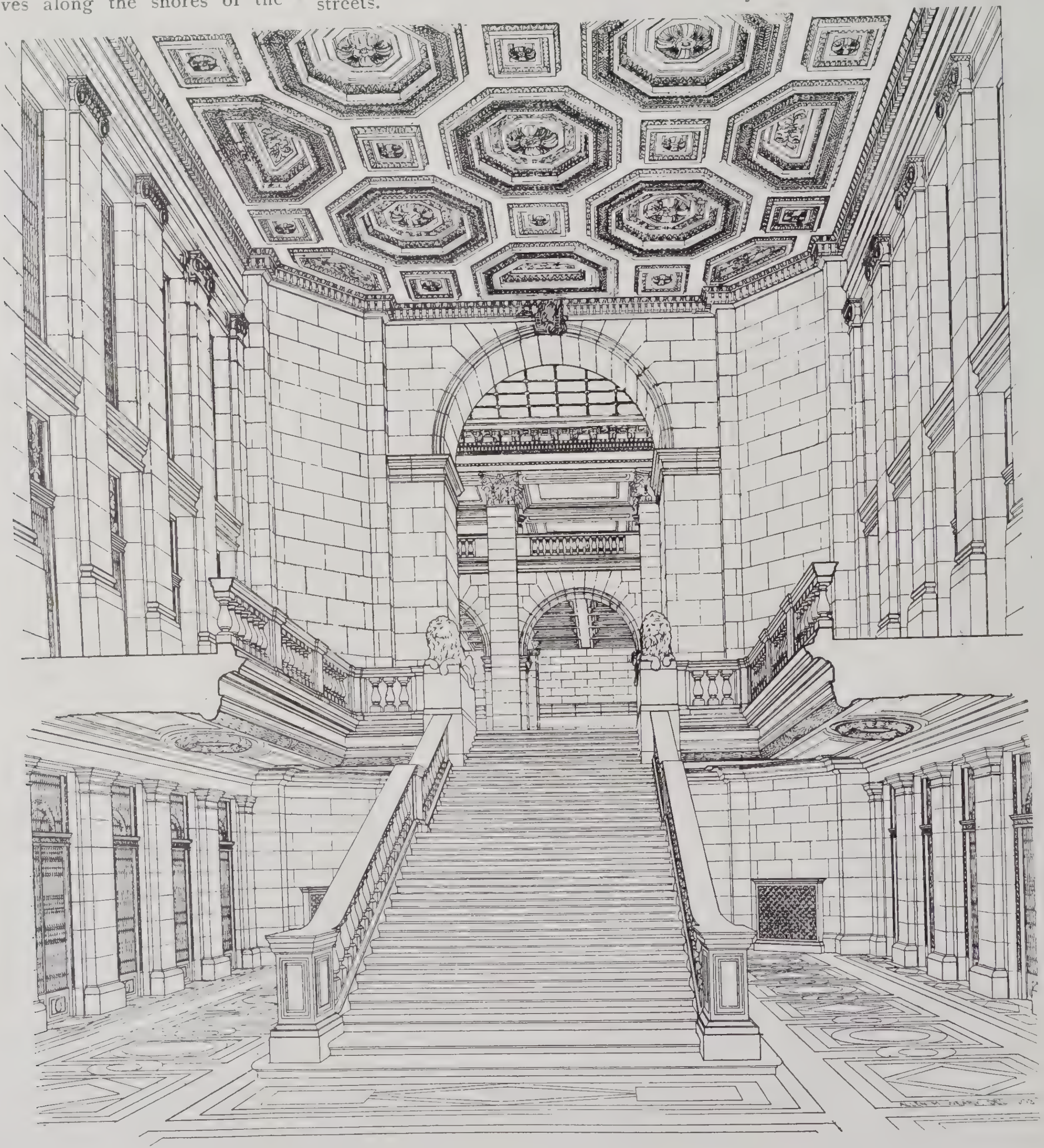
Fan-shaped grouping of radiating streets.

Diagonal arteries allowing direct communication from any city district to any other.

The avoiding of north and south, or east and west orientation of streets allows each of the four sides of the house to have the advantage of direct sunlight at some time during the day, with consequent gain in ventilation and sanitation.

The location of building sites for various activities is discussed in the report in groups consisting of the Government or National group, the Court House or Halls of Justice, the group comprising the Library, Museum, and Exposition buildings (which might be termed the group of Public Instruction), the Post Office, the Railway Station and approaches, the Municipal group, the official residences, the hotels, the Casino, public baths, and boat clubs (public recreation), the school centres, and the charitable institutions. The Development of Water Transportation considers additional harbour facilities, *esteros*—narrow canals—ramifying throughout Manila, and the establishment of open quays along the riverside.

The climate of Manila made it necessary to give special consideration to the subject of establishing accessible summer re-



STAIRCASE, FIRST NATIONAL BANK BUILDING, CHICAGO. D. H. BURNHAM AND CO., ARCHITECTS.

sorts on high ground, and led to the interesting study of the suburban districts.

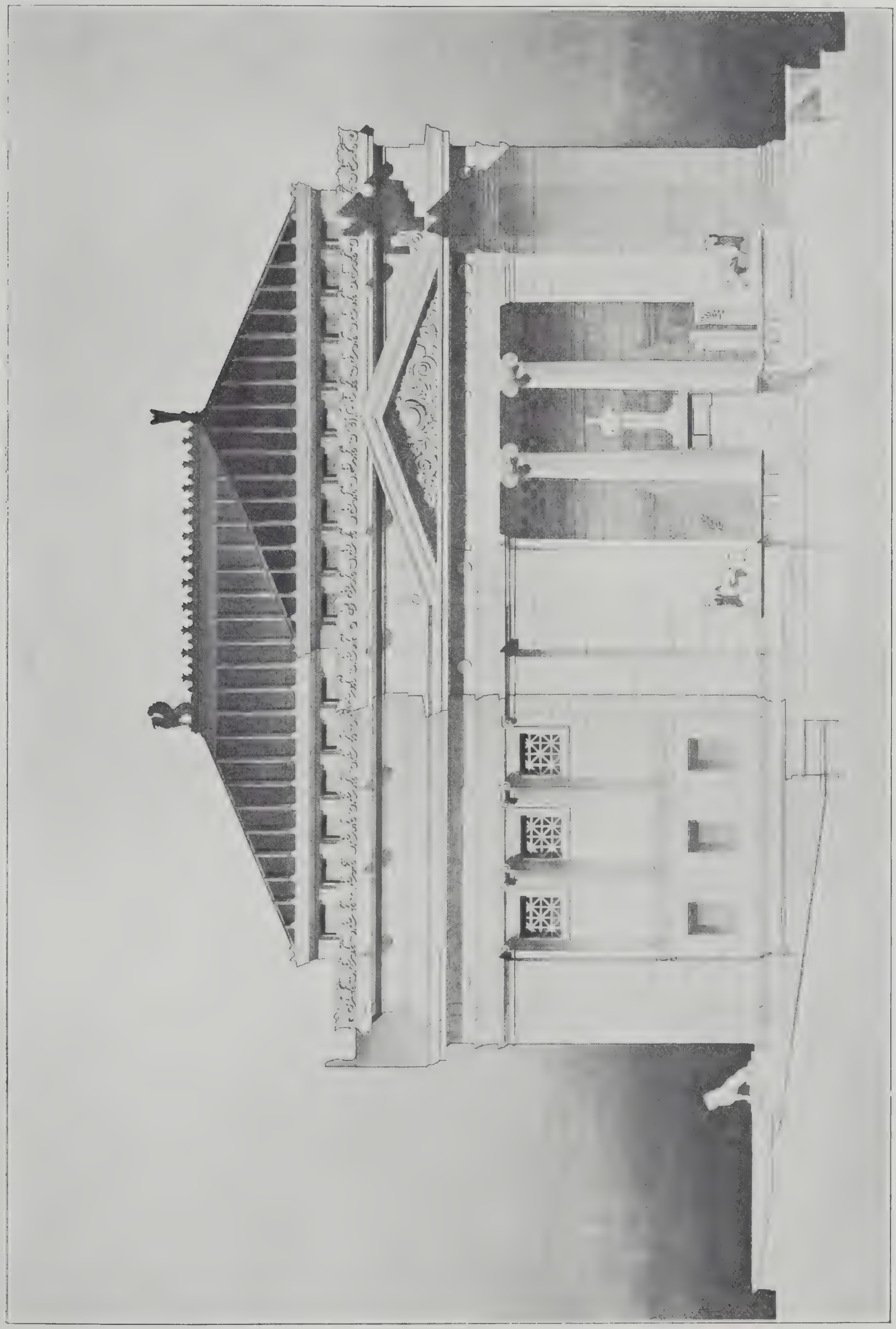
Not the least interesting point in connection with this report was the recommendation that buildings should be constructed of reinforced concrete for the purpose of resisting earthquake shocks.

Plan of Bagnio, the Summer Capital of the Philippine Islands.

The necessity of providing for a summer capital for the government of the Philippines led to the creation on the hills of Bagnio, about one hundred miles from Manila, of a city laid out on a plan similar to that made by L'Enfant for the city of Washington, in that it provides for such public buildings as may be needed for Government offices, for the service of the city itself, and for the healthfulness, convenience, and recreation of the people, and all these functions are so arranged as to make a unified and orderly city.

Plan of San Francisco.

This brilliant monumental study in town planning was made by Mr. Burnham, assisted by Mr. H. Bennett, in the year 1904, for the Association for the Improvement and adornment of San Francisco. Unlike Washington, Manila, and Bagnio, San Francisco is not a capital city, but a

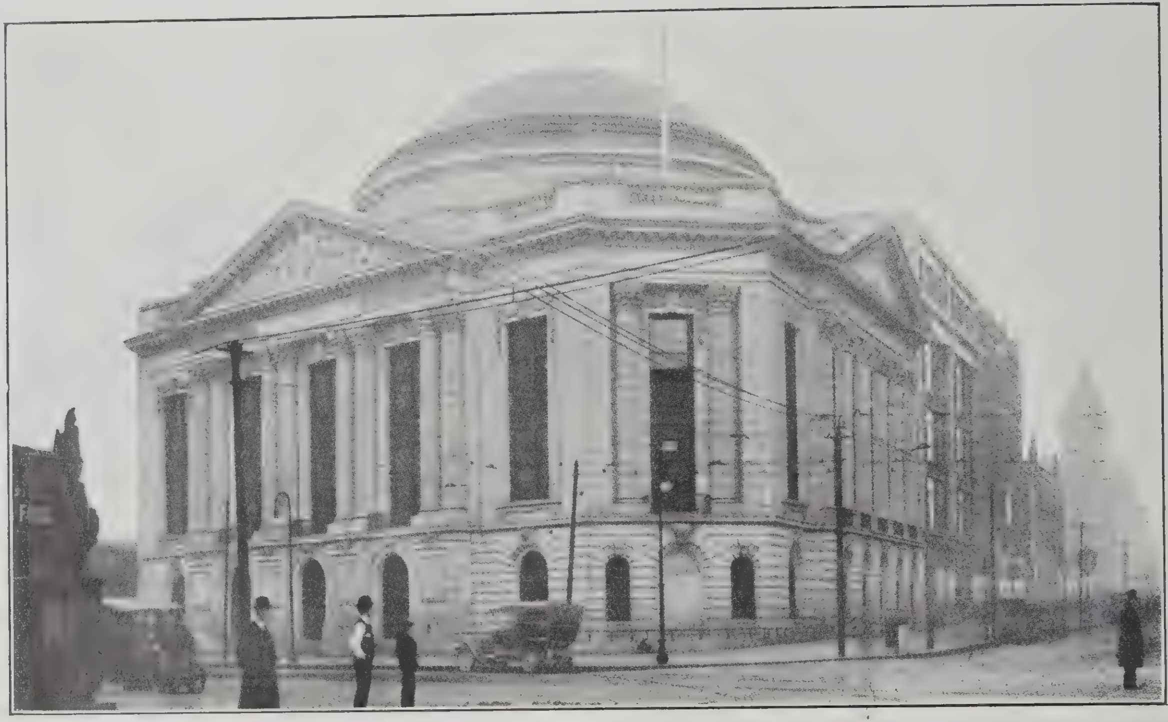


STUDENTS' PRIZE-WINNING DESIGN FOR A SAVINGS BANK. JOHN RUSSELL POPE, ARCHITECT.

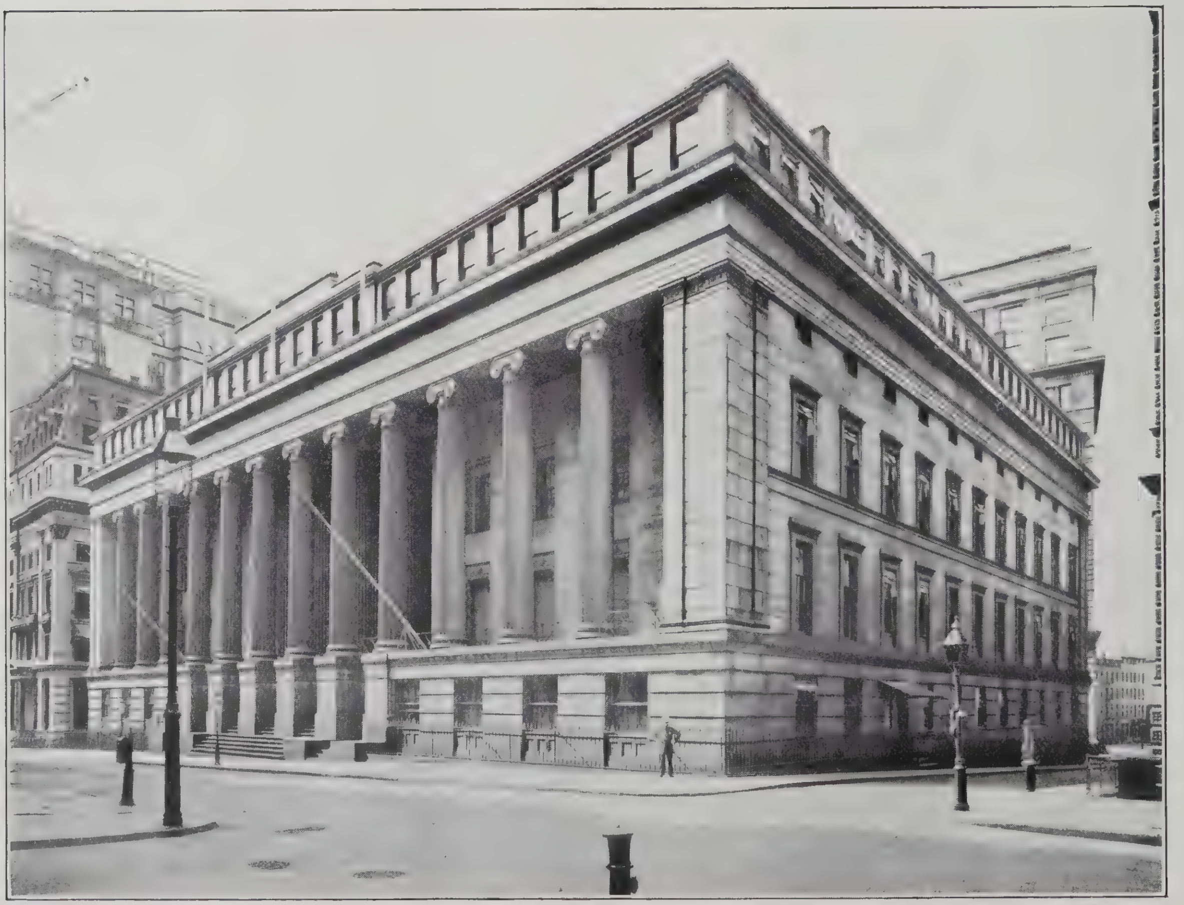
great seaport commercial town. It is consequently less monumental, and possesses fewer centres of interest than those cities. The plan prepared by Messrs. Burnham and Bennett is remarkable, principally as showing how it would be possible to convert the inconvenient and uninteresting plan of San Francisco into one that would be both convenient and beautiful by cutting a few diagonal avenues and widening a few streets. The increment in property value throughout the city alone would well justify the necessary expenditure for nearly all the work proposed. The sketches were most interesting, and the treatment of local centres, as Telegraph Hill (p. 550), and the Athenæcm looking to the sea (p. 551), are most valuable compositions and suggestions. The charming and domestic side of the design was suggested by the treatment for existing street frontages, and the strength of the planner was apparent in the plan of the new centre for the city.

The Plan of Chicago.

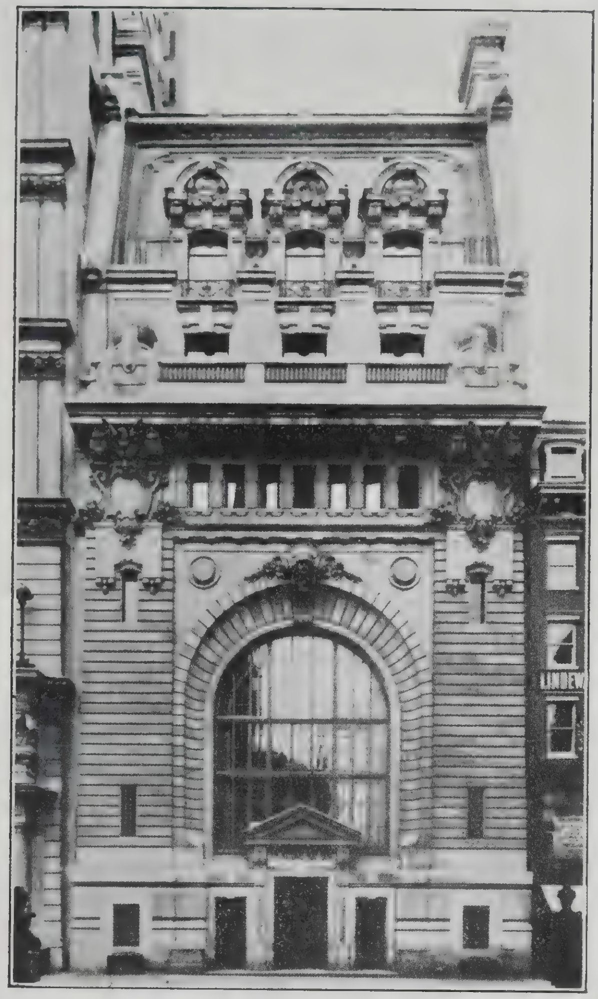
The Columbian Exposition of 1893 was the beginning in our days and in the United States of the orderly arrangement of extensive public grounds and buildings. It stamped itself indelibly upon the memories of all who saw it, and it continued to live in the memory of the people and dwell upon the minds of the architects who had created it. To the people of Chicago it called for some permanent memorial of itself. It suggested the improvement of the water front of Chicago. The year following the Exposition, the Park Commissioners proposed the improvement of the lake front from the site of the Exposition—Jackson Park—to Grant Park, a distance of about seven



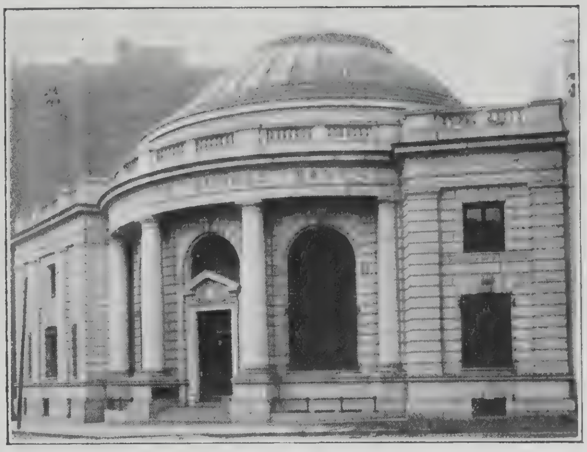
BANK, CLEVELAND TRUST CO., CLEVELAND, OHIO. GEO. B. POST AND SONS, ARCHITECTS.



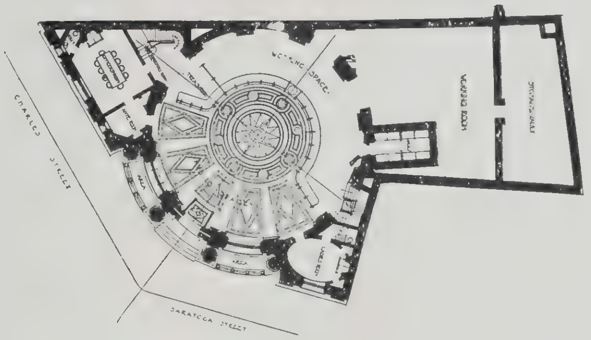
THE OLD CITY NATIONAL BANK, WALL STREET, NEW YORK CITY. ISAIAH ROGERS, ARCHITECT. *(See also p. 555.)*



THE NATIONAL PARK BANK, NEW YORK CITY.
DONN BARBER, ARCHITECT.



METROPOLITAN SAVINGS BANK, BALTIMORE.
PARKER, THOMAS, AND RICE, ARCHITECTS.



METROPOLITAN SAVINGS BANK, BALTIMORE: PLAN.

miles. A plan was prepared for the Commissioners, and subsequently exhibited at a dinner given by the Commercial Club. Many of the business men who were present at this gathering were emphatic in expressing their conviction that the scheme would be of the greatest value to Chicago and should be adopted and carried into execution. This was the inception of the project for a park out in the lake, having a lagoon between it and the shore, and for several years Mr. Burnham and his assistants worked on developing the design.

In 1906 the Merchants' Club arranged for the preparation of a complete project for the future development of Chicago. The following year this club merged with the Commercial Club under the name of the latter, and the work has continued under the auspices of that association. As proving the intensity of interest in this plan, it must be noted that the committee met several hundred times during the progress of the work; during many weeks meetings took place daily, and throughout the entire time no week passed without at least one meeting.

In preparing this enormous design the Commercial Club undertook the following task:—

First, to take into consideration the physical conditions of Chicago as they now exist.

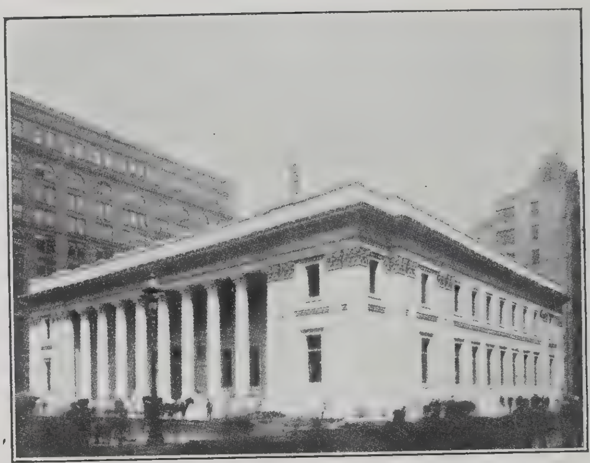
Second, to discover how those conditions may be improved.

Third, to record such conclusions in the shape of drawings and texts which shall become a guide for the future development of Chicago.

It is quite impossible to go into even the most general details of a project so vast as this. If the idea were proposed for any other city on earth it might be put down as a most extravagant dream. But with Chicago nothing is impossible. Anything that is really worth doing is probable of execution. The people of Chicago are so accustomed to results beyond their most sanguine predictions that they hope easily, believe easily, and accomplish easily. They are a people trained in intense commercial activity, who understand that great success cannot be attained unless the special work in hand be entrusted to those best fitted to undertake it. It is the habit of Chicago's business men to select someone to take the responsibility in every important enterprise, and to give to that person earnest, loyal, and steadfast support. In the preparation of this plan, which is perhaps the most gigantic work ever placed in the hands of an architect, Mr. Burnham was selected to take the principal responsibility. The plan, which as a scientific and artistic treatment of the city as a whole is unrivalled by that of any existing city in the world, is now complete, and with the many beautiful drawings of details, has been published this year in a magnificent quarto volume by the Commercial Club of Chicago. The conception of this plan of itself—had he done nothing else—is enough to give to its author a permanent place among the greatest architects of his or any other century. We have, however, an abundance of monumental works by him which might be regarded as details of this plan, and any one of these "details" would be sufficient to make a reputation for most architects.

In the above notes it has been attempted to gather together in brief review the more important works of this architect; more than that it is impracticable to do in these pages—it is impossible, within the space at command, to do so much as even give a list of the numerous houses, many of which are remarkable for charm and dignity, or of the gardens, park shelters, small club houses, etc., built from his designs; nor to mention more than the best known of his many good deeds done in behalf of his art, his confrères, and of the younger men. It is almost needless to recall his famous letter to the Secretary of the Treasury—Carlisle—during the period of his Presidency of the American Institute of Architects, or the importance of his influence in bringing about reforms in the office of the Supervising Architect of the United States Treasury Department; and placing a competent architect in charge of the designing of the smaller post offices, custom houses, etc.

Two things which he has done are, however, especially worthy of note and grateful remembrance: First, by his fellow citizens, as regards the important duties he has performed, *as a citizen*, in giving gratuitously his time and thought to the planning of cities in order that posterity may enjoy advantages beyond those of the present generation—a labour which somebody ought to perform for nearly every city, and a task which Mr. Burnham has undertaken in the instances mentioned. Second, by good sportsmen, the world over, who love fair play in all things, and by that numerous band of men who are to be classed with "Full many a gem of purest ray serene," whose worth is never generally known, but who can applaud the breadth of character in a man who brings to light some of their number by sharing the credit for his work with those of his subordinate co-workers who are his principal assistants upon a given work. It is due to this generous trait that the "and Co." ordinarily appears after Mr. Burnham's name. It is, therefore, in a sense not a commercial title, and deserves honour as well as respect in this unique case—it relieves the necessity of an explanation of the association, upon a design, of a number of artists, and engineers, most of whom are in his employ, but whose identity he chooses to reveal rather than conceal, and whose names he has coupled with his own. He is always the real designer of the work which bears his name; and except in those instances when the name of the assistant is fully acknowledged, may be always safely regarded as the sole architect.

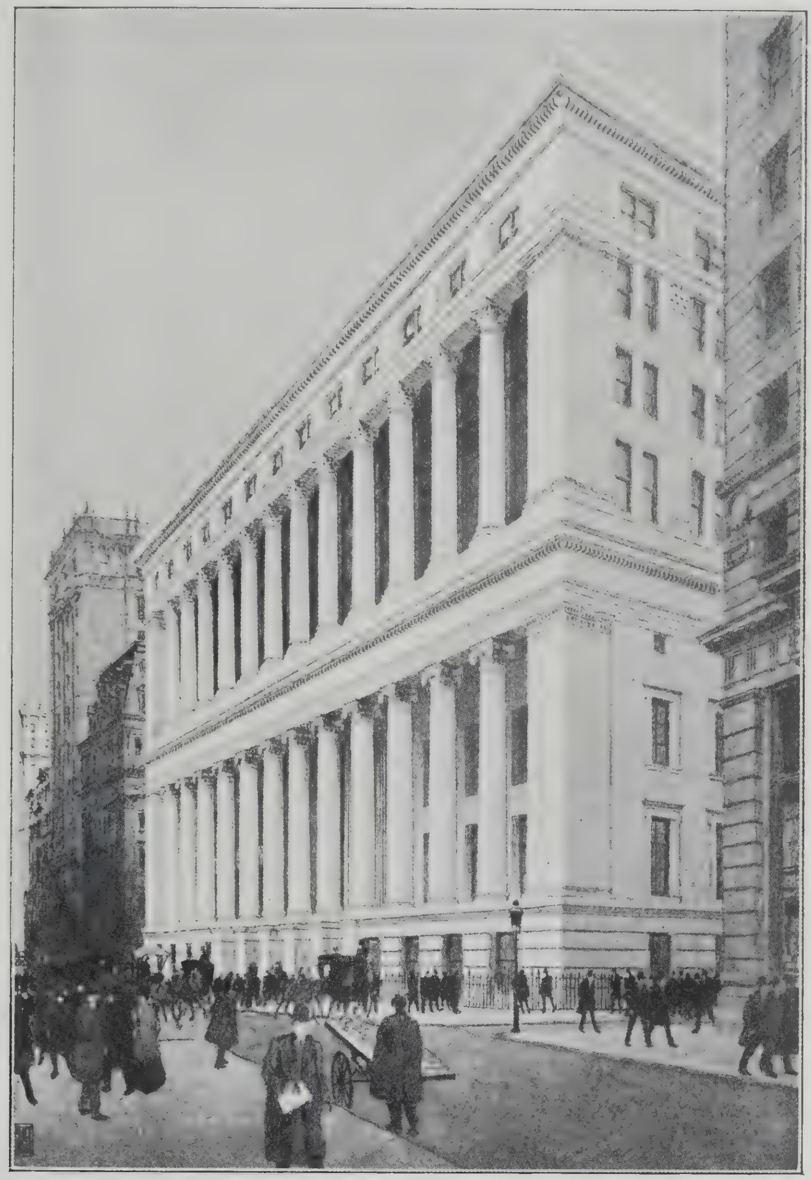

ILLINOIS TRUST AND SAVINGS BANK.
D. H. BURNHAM AND P. J. WEBER, ARCHITECTS.

THE LATE CHARLES FOLLEN McKIM.

The death of Charles Follen McKim, which occurred on September 14th, 1909, was a distinct loss to the world of Art, for he was unquestionably an artist. Born in Chester County, Pennsylvania, on August 24th, 1847, he was educated in the Scientific School of Harvard University, where, when about twenty years old, he took his degree. For the next three years or so he was in Paris, studying in the Ecole des Beaux-Arts and in the Atelier Daumet. Then returning to America, he entered the office of a New York architect, where he met young Mead, who, in 1880, when Stanford White returned from Europe, formed the second name in the now world-famous triple partnership of McKim, Mead, and White.

The work of the firm of which Dr. McKim was senior partner has perhaps exceeded in volume, variety, and aggregate cost, that of any other architect or firm of architects of any era. It includes, as stated by the writer of an important biographical article that was published in the October issue of the "Architectural Review," from which we are at liberty to quote, "every class of building, in extent, from the tiny bungalow of the late Mme. Modjeska in California, to the vast pile of buildings for the New York station; in style from the rugged and picturesque Casino at Narragansett Pier to the grave and stately library of Columbia University; as to use, from the gates of Harvard University to the skyscraping new municipal offices of the city of New York." Among university buildings the firm's commissions included Virginia, Columbia, New York, with gates and buildings at Harvard, some of the buildings at Brown and Cornell; among libraries, that at Boston, which is one of the best of their earlier designs; of clubs, the University, Metro-

BANKING HALL, NATIONAL CITY BANK, NEW YORK CITY. McKIM, MEAD, AND WHITE, ARCHITECTS.



THE NATIONAL CITY BANK, NEW YORK CITY, AS ALTERED BY McKIM, MEAD, AND WHITE, ARCHITECTS.

The old bank, to which a story has been added, is shown on p. 552.

politan, Harvard, Lamb's, Freundschaft, and Century in New York, the Mount Royal at Montreal, and the Algonquin at Boston; of Museums, the Brooklyn Arts and Science, the Walker Art Museum at Bowdoin College, Maine; of Government buildings, the new New York Post Office, the War College, the interior designs of the Executive Mansion at Washington, the Rhode Island State Capitol at Providence. The firm built the Nangatuck High School, the Madison Square Garden structures, Boston Symphony Music Hall, the Washington Arch, the New York monuments to Farragut, Cooper and Hale, the Chicago monuments to Logan and Lincoln, the Battle monument and Cullom Hall at West Point; churches at Stockbridge (Mass.), Nangatuck, Rhode Island, Chattanooga, Tennessee, Moristown; and the Judson Memorial Church and Dr. Parkhurst's church in New York. From an enormous list, only some of the more prominent buildings can be mentioned here. They comprise two of the best buildings at the 1893 Columbian Exhibition of Chicago, namely, the Agricultural Palace, and the New York State building. Their domestic work comprises almost countless residences, among which may be mentioned the Villard, Robb, Morton, Vanderbilt, and Tiffany houses at New York, many town houses at Buffalo, Chicago, Boston, and Washington; and almost countless country houses, notable among which are the houses of Mrs. Elliot F. Shepard at Scarborough (N.Y.), of Mrs. Herman Oelrichs and Mr. E. D. Morgan at Newport (Rhode Island), of Mrs. Clarence Mackay at Roslyn (N.Y.), of Mr. Frederick Vanderbilt at Hyde Park (N.Y.), and of Mr. Ogden Mills at Staatsbury (N.Y.)—all of which might be not inaptly described as palaces. The firm's business buildings and hotels are also legion, and only a few of them can be named, such as the original Imperial Hotel, the Savoy, and the Yosemite Apartment House in New York; offices of the New York Life Insurance Company in New York, Kansas City, and Omaha; the Goelet and Warren buildings, the Tiffany and Gorham shops, and the "New York Herald" and "Judge" buildings in New York; the great Niagara power-house at Niagara Falls (N.Y.), the printing house of the "Cosmopolitan" at Irvington on the Hudson; the Cable building and the huge Sherry's Restaurant at Forty-fourth Street and Fifth Avenue, New York; the Girard Trust Company's bank at Philadelphia; the State Savings Bank at Detroit; the Bank of Montreal in Canada; the National City Bank, the Bowery Savings Bank, and the two buildings of the Knickerbocker Trust Company, one in Wall Street and the other in Fifth Avenue, New York. This catalogue, in its bare enumeration of big buildings of varied character, suggests amazing versatility and resource; and those who have seen the buildings themselves, or merely illustrations of them, admit that in this vast mass of work there is much that is noble, dignified, and truly artistic. The early efforts of the firm seem to be based on Hunt and Richardson. Later, Renaissance models were followed, but not slavishly; for, as a writer during that phase observed: "Whatever criticism has been made at length on the use of precedent in their buildings separately considered, it must be acknowledged that the firm of McKim, Mead, and White have always possessed an exact estimate of the value of ancient forms as stimulants to the imagination. Theirs is a method of selection—a choosing of the beautiful and useful, a rejecting of the inartistic and commonplace of former architectures. It is not, as some would suggest, a blind groping after an harmonious effect, but it is marked by the scientific element which distinguishes the artist from the artisan. They seem able 'out of a senseless Nothing to evoke a conscious Something.' Their adaptations have taught them, in their maturer work, to add soul and grace to purely modern products."

For much of the merit of these works Mr. McKim must receive the credit. It was he who drew the attention of America to the riches of European architecture, by adapting foreign successes to American needs, especially in the application of Classic and Renaissance design to modern problems. A true patriot, like his father before him—James Miller McKim was an anti-slavery leader—he was above all a true artist. By adopting mural decoration for the halls of Boston Public Library, he may be said to have introduced it to America, and to have made for Sargent, Abbey, and Puvis de Chavannes the opportunities which they have known so well how to make use. He had a fine and true taste in sculpture as well as in painting, and he gave splendid employment to the talent of the sculptor Augustus St. Gaudens, a friend from student days. He gave many opportunities also to Martiny and McMonnies. The beautiful Bacchante, which is now the envied possession of the New York Metropolitan Museum of Art, was commissioned to McMonnies by McKim for the Boston Library, which lost it in consequence of an absurdly prudish objection to the nude by a puritanically prejudiced section of the community. The French Government ordered a replica of this statue for the Luxembourg.

It would not be correct to ascribe to Mr. McKim solely any of the work of the firm. It is safe to say, however, that none of the work ever went through the office without the benefit of his criticism and advice; but, of course, the other partners are to be reckoned with. When Mr. White died, his admirers were disposed to insinuate that the artistic spirit of the firm died with him; but since his death the work of McKim, Mead, and White has undergone no perceptible change of character! and, in fact, the partners worked so beautifully together, and saw things from so similar a standpoint, that so long as Mr.

Mead remains the good work will go on. If it be asked, who took the lead? the answer is, sometimes one, sometimes another; but if there was one who had the final determining word, whose judgment was deferred to by his associates, that one was assuredly Charles Follen McKim.

Mr. Francis S. Swales, in a memoir contributed to the "Architectural Review," concludes with the following tribute to the man he was privileged to know: "McKim's life was a full and busy one. Work, honours, distinctions, were crowded upon him; he was not less distinguished as a patron of art, connoisseur, and clubman, than as an architect. He was a friend and patron of Columbia University, and a founder of the American School at Rome. As a benefactor of art in the most material way he took a leading part, and deserved the greatest praise."

III.—Commercial Buildings.

That the commercial buildings of America are a class by themselves, are the result arising from the demands of the utilitarian minds of the men of commerce, and are unlike the corresponding buildings of any other country, is generally and fully recognised. That many of these buildings are thoroughly successful as designs—or are at least admitted to be so by the majority of architects in their own country, and by Europeans who have had the opportunity to study them at first hand —is a fact that is probably much less familiar.

The Tall Building.

Of the beauty of the high type of building to which the British mind reverts whenever mention is made of American architecture, it may be said that, as with any subject involving the study of beauty, very much depends upon the prepossessions and the receptivity of the observer.

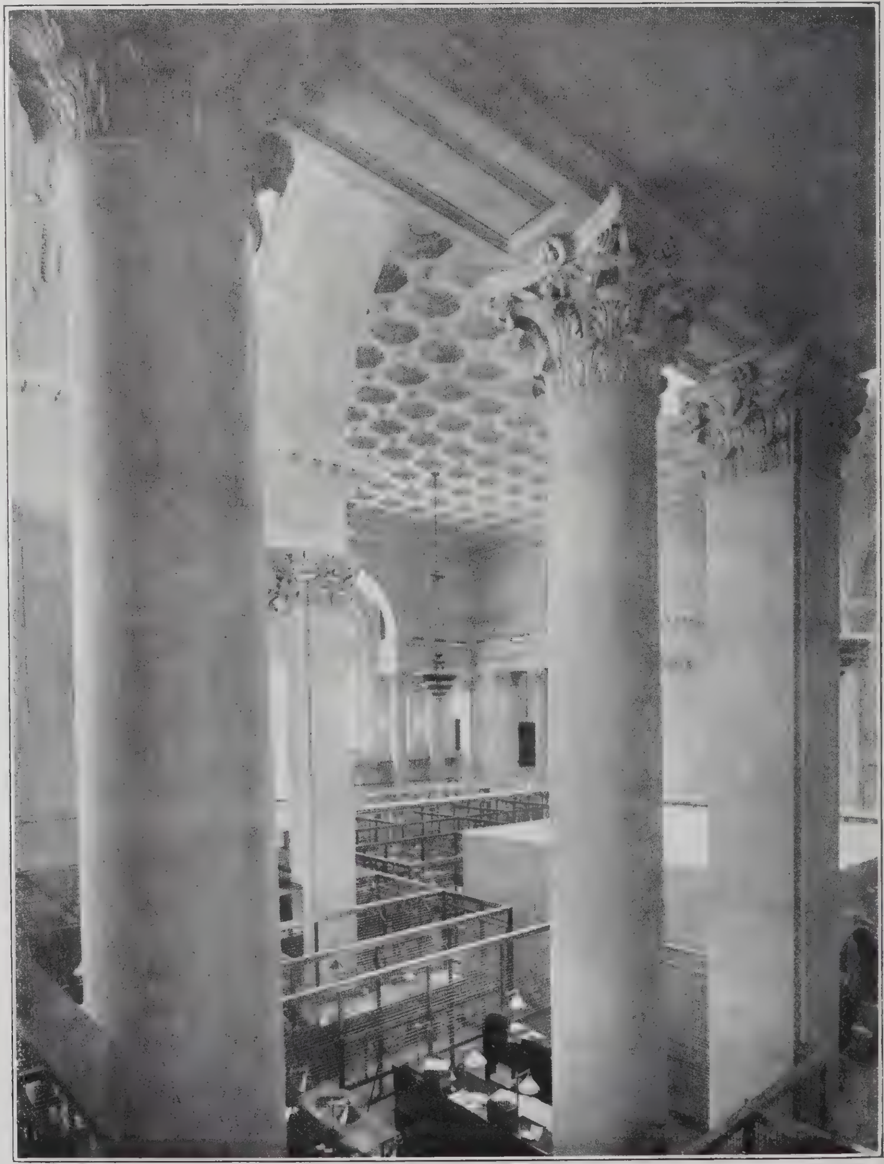
These buildings may be classed under a few general headings which will cover most cases, namely: (1) Those of one or two storeys, which include the better class—the class that seeks to be conservative, at least in appearance—of banks, the clearing houses, exchanges, and the buildings occupied in their entirety by the offices of a single company which prefers to preserve its identity in segregation rather than to lose some of it by taking offices in a building occupied also by other tenants. (2) The shops or "stores," industrial and storage buildings, usually from three to ten storeys in height, which are not very different in their requirements from those on this side, but possess certain features, general and national characteristics of design, which render them architecturally interesting—which, in fact, give them their peculiar distinction. (3) The buildings for office purposes, those of more than ten storeys in particular, which sometimes also contain a bank, shops, or club—occasionally all of these—and a restaurant, large meeting hall, or other feature which permits form to follow function without making the whole exterior exactly like a honeycomb. This last is the American "skyscraper," the type which has caused so much discussion—from several points of view—among the engineer-architects as to its permanency or "life," among the artist-architects as to its adaptability to artistic solution, and among other people, not very well informed upon the subject, as to its safety, convenience, necessity, healthfulness, effect upon neighbouring property, and its general justification. To the much-debated and much-abused skyscraper, therefore, it may be well to devote particular attention. In accounting for it, or in attempting to trace its genesis, another backward glance at the history of the country becomes necessary.

Historical Data.

Everybody knows, though the data are easily forgotten, that, as recalled in the introductory section, the United States became a nation less than one hundred and thirty-five years ago; that its commercial prosperity suffered almost to ruin during the seven years that it fought for independence; that it again suffered a severe set-back in the struggle with Britain known as the war of 1812; that fighting with the Indians continued from the founding of the various colonies of Spain, Britain, France, Holland, and Sweden up to within the memory of men who are to-day in the prime of life. There was a war with Mexico in the forties, and the well-known struggle over the questions of state rights or union, and of slavery, in the early sixties. But if these had the effect of a temporary check upon commerce (and the latter undoubtedly left the whole southern half of the country in a state of poverty bordering upon ruin), the commercial activity which began during the period of colonisation continued with redoubled energy after the civil war; new villages sprang up and, with perhaps unprecedented rapidity, developed into large towns in a few years; the towns along the great lakes became flourishing cities. Then the great fires of Boston and Chicago, the disastrous financial panic, the Centennial Exhibition at Philadelphia, all occurring during the seventies, gave tremendous opportunities for rebuilding on better lines, checking the spirit of speculation, establishing business after the return of prosperity, upon a firmer basis, and bringing the country in contact with the arts and products of the old world, with a consequent rapid growth of travel and study by Americans in Europe.

Hunt and Richardson.

In architecture the personal influence of two men, trained in the Paris Ecole des Beaux-Arts, was especially felt—of Richard Morris Hunt (1827-95), through his words and deeds quite as much as through his works; and of Henry Hobson Richardson (1828-86), predominantly through his works. Reference has already been made, in the foregoing summary of the paper read by Mr. Swales before the R.I.B.A.,



THE NATIONAL BANK, NEW YORK CITY: DETAIL. McKIM, MEAD, AND WHITE, ARCHITECTS.

to these two notable names in the history of American architecture, but it cannot be too strongly emphasised that these two men, with others of less fame but high ideals and thorough culture, did much to elevate architecture as an art in the public esteem. Richardson was probably the first American architect to treat a commercial building as a type different from a building for shops and flats, and his Lionberger building in St. Louis, and his well-known wholesale store for Marshall Field in Chicago, may be numbered among the earliest examples of distinctively commercial architecture in America. These, though designed for prevailing conditions and possessing great originality in design, as well as in the use of materials, may be said to differ from similar structures in Europe only as much as these might differ from one another; the distinctive character was given by the genius of the architect working along lines of common sense.

Advent of the Iron Skeleton.

The system of construction was at that time much the same as it is in England at the present time. The outside walls were of self-supporting masonry and also carried a portion of the floor loads, while iron columns and girders were only used internally. Practical conditions limited the height of such structures to about nine or ten storeys. The necessarily proportionate thickness of outer walls, and the pyramidal foundations, were found to occupy so much valuable ground and basement space that it was not economy to go higher. In Chicago, as in New York, there was keen competition among business men to concentrate themselves within a limited area. The land within such areas consequently acquired enormous value. The alternative to building wide (which was impossible, concentration being not only physically compulsory, but essential to convenience and dispatch) was to build high. The problem of building high was solved by the introduction of the iron "skeleton" construction. This was first employed by the architect W. L. B. Jenney in the ten-storey building for the Home Insurance Company in Chicago in 1883, thus creating the type which, irrespective of the individual architect, may be considered as being purely American in origin and development.

Mr. Jenney's System.

"In order to obtain a maximum of light for the offices proposed in his new design, Mr. Jenney decided to reduce the width of all exterior piers as much as possible, and to use cast-iron columns within the piers to carry the floor loads, thus relieving the masonry piers of these loads, and consequently reducing their areas. . . The exterior piers were made self-supporting, but the spandrel portions, between the top of one window and the bottom of the window above, were carried on iron girders placed in the exterior walls and extending from column to column." The immediate success of the new type of construction led to its general adoption, and to its speedy development into the modern steel-frame "Cage" construction, in which all structural members are of rolled steel with riveted connections. All external masonry above the first floor, as well as the floor loads, is supported upon members of this steel frame, and the height to which it may be carried is limited naturally by problems of economy and the elevator service, and in some instances artificially by legislative enactment.

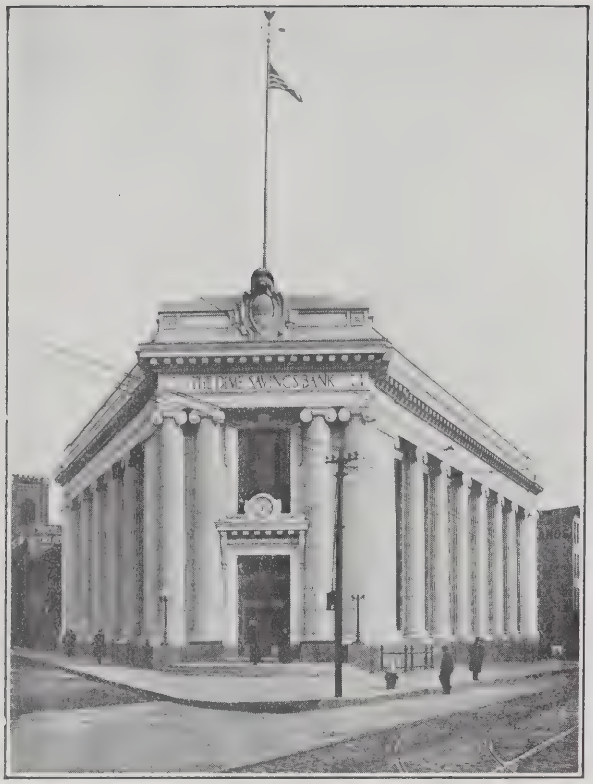
Genesis of the Tall Building.

The high building was brought into existence as a means of making money for its owners; but obviously it could not have served this object, unless it had commended itself by its convenience and utility. By the American business man it is regarded as a great time-saver, focussing and facilitating business transactions, eliminating, dispensing with the need for an extravagant number of messengers, assembling the staff under close supervision and control, and altogether economising the expenditure of both time and money, and thus securing to the business heads more leisure and more money to expend in the enjoyment of it. It must be evident, writes Mr Swales, to anyone with a knowledge of the conduct of business in very large offices that too large a ground area can be a serious drawback, that horizontal extension quickly reaches a practical limit, too much time is spent in walking from place to place; while an almost ideal arrangement is one with the principal office on the first floor opposite or within a few steps of the elevators and stairs, with the offices of the principal departmental assistants ranged one over the other directly above that of the chief. To what extent this must be considered is evident when one remembers that a large railway office usually contains several hundred clerks. There is a fourteen-storey building in St. Louis, one hundred by one hundred and fifty feet, occupied entirely by such offices, and Mr. Swales was told by one of the officers of the company that the building is entirely inadequate for its purposes. This is, however, a rather exceptional case. More often the building is large—large beyond the requirements of one company, the surplus space being let out to smaller occupiers; indeed, often being erected solely for the occupancy of the latter—brokers, promoters, professional men—rendering the commercial character of the structure dominant and conspicuous.

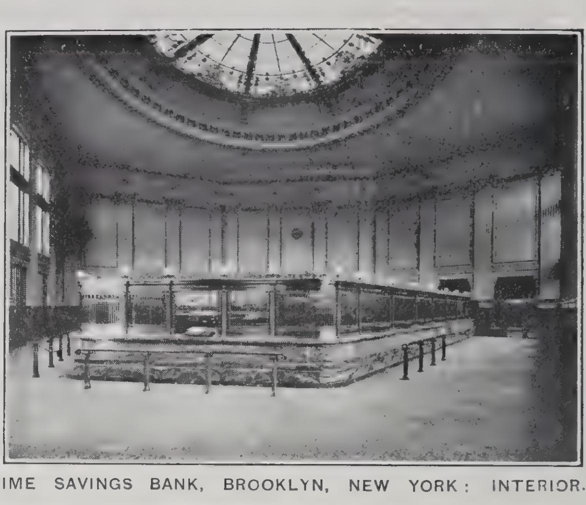
Engineer and Architect.

It is not surprising to find engineers claiming this class of work as belonging to their profession, and endeavouring to place the architect upon an inferior footing. One engineer who has boldly advanced this claim, writes protesting that architectural adornment is "a waste—is, to put it in plain English, perverting someone's money," and, in the same article, admits that "high rents cannot be obtained from a building with its halls finished in concrete when the adjoining buildings have a marble finish." His inconsistency is amusing; for how does it happen that a man so absorbed in business that he is supposed to care nothing for appearances or surroundings—who by the engineer is rated so low as not to appreciate the difference between a building that possesses architectural merit and one

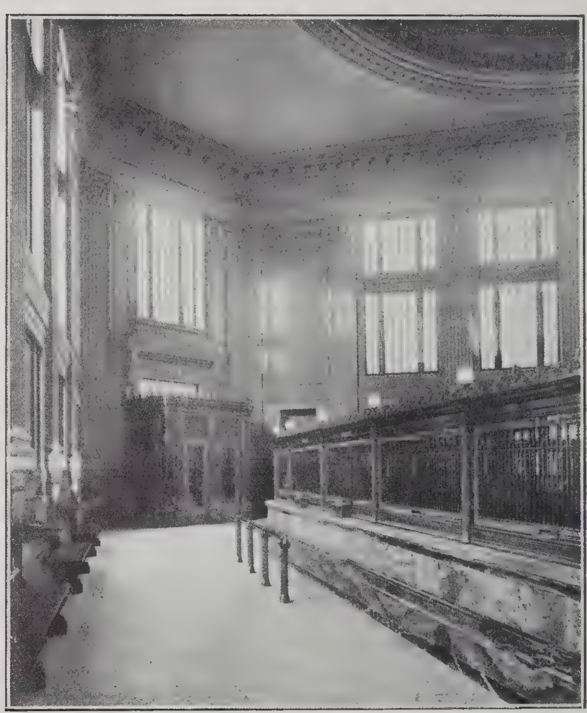
WALL STREET, NEW YORK CITY, LOOKING TOWARDS TRINITY CHURCH.



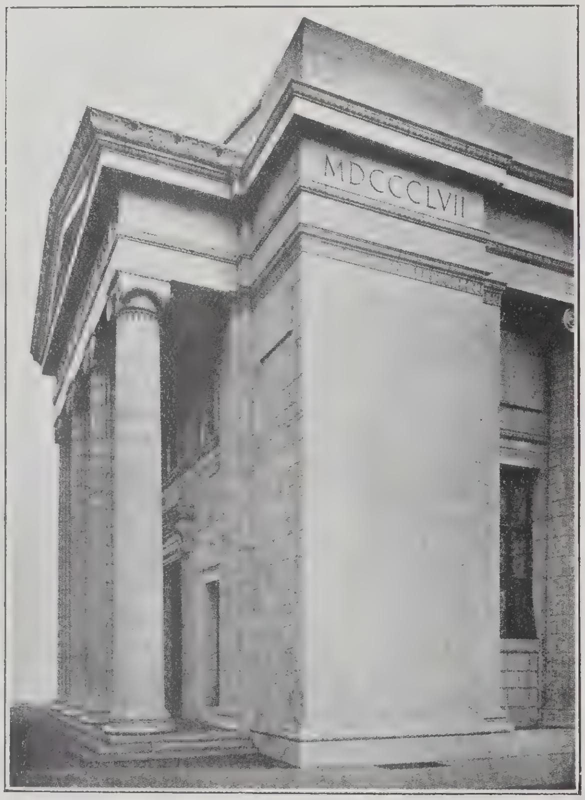
DIME SAVINGS BANK, BROOKLYN, NEW YORK. MOWBRAY AND UFFINGER, ARCHITECTS.



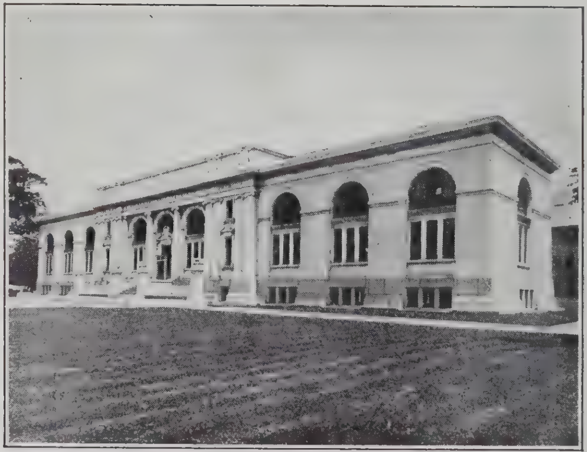
DIME SAVINGS BANK, BROOKLYN, NEW YORK: INTERIOR.



DIME SAVINGS BANK, BROOKLYN, NEW YORK: INTERIOR.



THE CONNECTICUT SAVINGS BANK, NEW HAVEN, CONN. GORDON, TRACY, AND SWARTWOUT, ARCHITECTS.

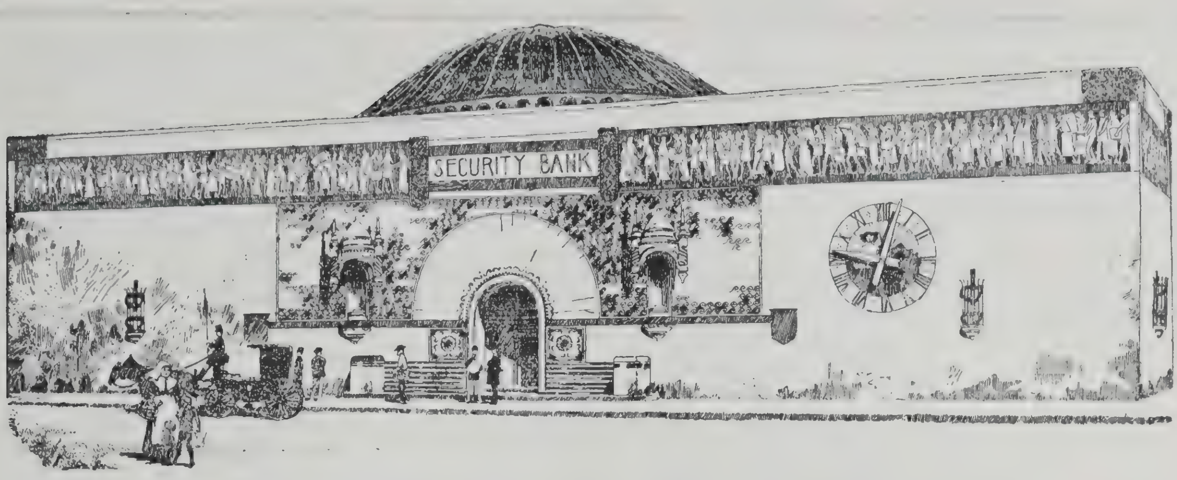


LIBRARY, COLUMBUS, OHIO. ALBERT RANDOLPH ROSS, ARCHITECT.

that is as bald as a factory, or perhaps vulgar beyond description—will not pay, for the same amount of space, just as high a rental for an office in the economical concrete construction of the engineer as in the structure with the marble finish? This scornful allusion to "marble finish" seems to suggest a subtle something that the engineer, with his narrow training, has failed to apprehend. Apparently, he is unable to realise either the æsthetic or the commercial value of an agreeable air of luxury and comfort; an indefinable air about the building that is not fully accounted for by the suggestion of mere expense—that quality which is present in every good design, and which the architect calls "character" and the layman "style."

Building for Time and for "Eternity."

Here, as elsewhere, we find that the builders are of two familiar types. There is the speculative builder, who puts up the kind of building that is expected to pay ten to fifteen per cent. for, say, fifteen years, and then to be torn down; and there is also the investing company which erects buildings of intrinsic merit, and entrusts the whole undertaking to the ablest architectural talent obtainable; sometimes by direct selection, as in the case of the buildings for the New York Life Insurance Company, whose principal buildings in New York, Omaha, Kansas City, Montreal, and elsewhere, were

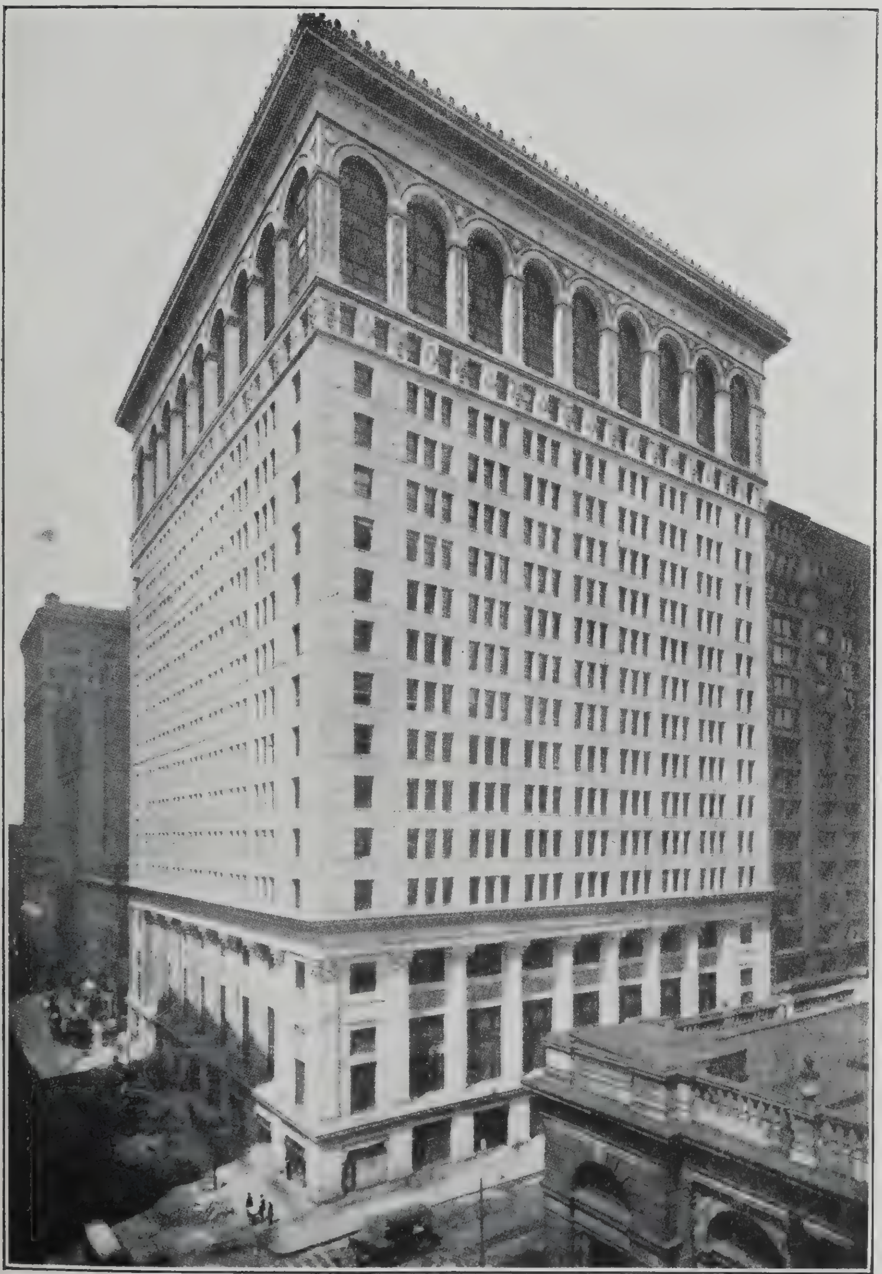


SECURITY BANK, MINNEAPOLIS, MINN. HARVEY ELLIS, ARCHITECT.

designed by McKim, Mead, and White, and by Babb, Cook, and Willard, the building for the "Mail and Express" by Carrère and Hastings, and the Singer Building by Ernest Flagg, both in New York; sometimes as the result of competition, a notable example of which is the American Surety Company's building in Broadway, New York, by the late Bruce Price (p. 532).

Magnificence that Pays.

It may be freely admitted that there may be an ulterior motive to account for extreme magnificence. These companies advertise, and every really alert business man knows that there is a public which can be reached through the channels of fine art that might not be so readily accessible by any other means—a public well-informed, critical, and influential—with a love of art and of luxury, which discriminates against the ugly and incompetent—a public not at present in the majority anywhere, except perhaps in France or Austria, but, nevertheless, sufficiently numerous and potent in America not to be ignored by astute men of affairs. The desire to gain the patronage of this select community is leading to the study of its requirements, is awakening an interest in its ideals, bringing about a genuine conversion to its views, and an inclination to advance its standards. The tendency to strive for higher and truer standards of taste in design is one of the most hopeful signs in the American life of to-day; and, consequently, American architects are in the happy position of enjoying unprecedented opportunities to prove their ability as artists; and the enlightened policy of offering a liberal purse for the endowment of artistic enterprise has continued with varying success during the last eighteen or twenty years, in Chicago, Buffalo, St. Louis, Boston, Baltimore—in all the largest cities, but most especially in New York.



THE COMMERCIAL BANK BUILDING, CHICAGO. D. H. BURNHAM AND CO., ARCHITECTS.

Influence of Environment.

The borough of Manhattan, New York, is an island about a dozen miles long south to north from Battery Park to the Harlem River, and two miles wide east to west from the East River, which separates Manhattan from Brooklyn, to the Hudson River, which is a boundary between the States of New York and New Jersey. In the triangular space at the southern extremity and bounded on the north by, say, Chambers Street, City Hall Park, and the Brooklyn Bridge—a triangle almost equilateral, and less than a mile in altitude—is the portion known as the Wall Street district, corresponding to New York as the City does to London. Within this area are to be found examples of nearly all the early experiments, as well as the most highly developed types of tall buildings. It is also the district where the demand for space is greatest, and where, consequently, the value of land reaches the most excessive and almost incredible extremes. The tendency continues; and, unless some unforeseen contingency arises, the entire district will before long be exclusively occupied by tall buildings; while those of ten or twelve storeys will probably have their height doubled.

Two Chief Types of Tall Buildings.

Only one or two types represent more than a merely experimental attempt to solve the artistic problem. There are two types which appear to be in course of evolution; one expresses the office unit by means of windows alone, either by a single or the more frequent double window to each office. The exterior is designed with sole reference to the material with which it is clothed and the purposes to which it

GIRARD TRUST BUILDING, PHILADELPHIA. McKIM, MEAD, AND WHITE, AND ALLEN EVANS, ARCHITECTS.

THE STATE SAVINGS BANK, DETROIT. McKIM, MEAD, AND WHITE, ARCHITECTS.

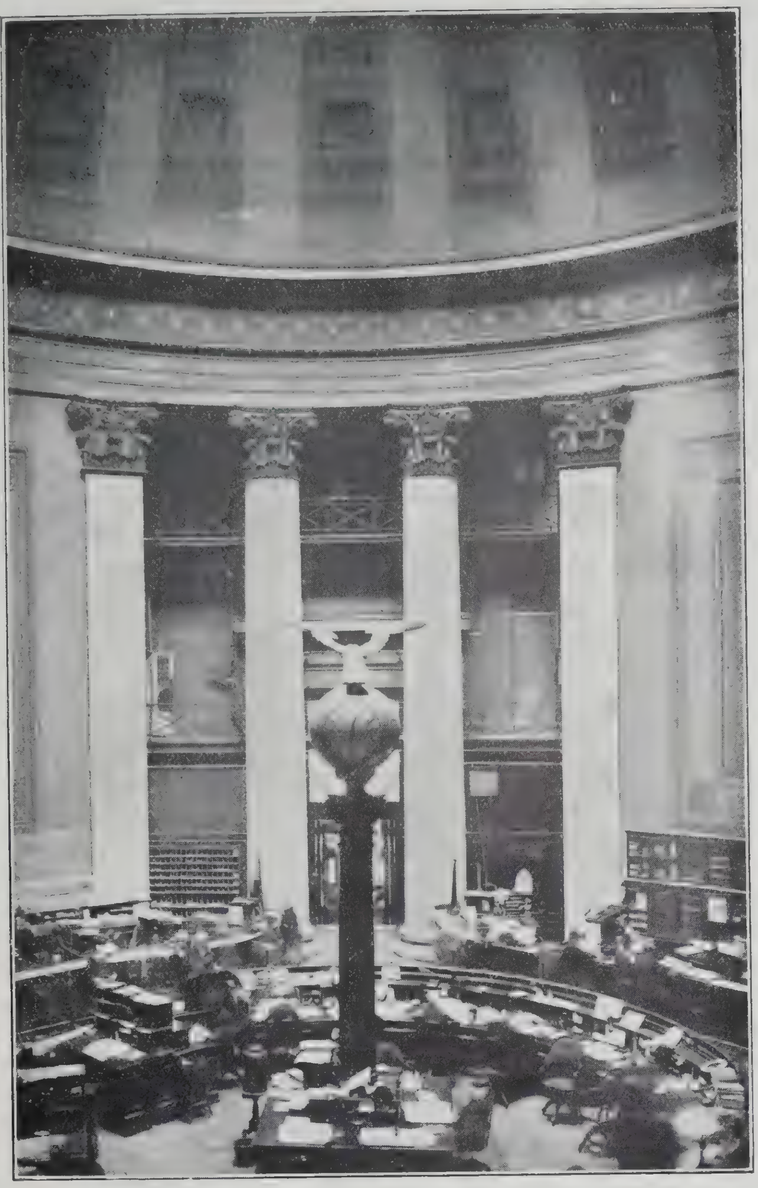
is put, no special heed being taken of the steel skeleton, the lines of which are marked by the masonry and acknowledged externally only by the slight reveals to the window openings, and the ranging of openings one immediately over the other. The other type very clearly indicates the light structural lines of the steelwork; in fact, only so much masonry as is necessary to protect the steel frame against disintegration and danger from fire is employed, the protective material being usually of terra-cotta. The manufacture of this material has been carried to a very advanced state of perfection, and it has been very largely adopted for both constructive and decorative purposes.

Early Attempts at Artistic Design: Harvey Ellis.

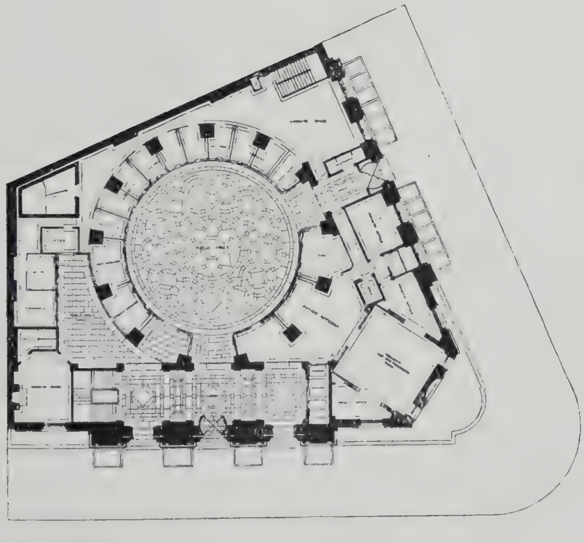
Of the first-mentioned type perhaps the earliest example of design which could be in the least regarded as architectural was a project for a twenty-eight-storey building (p. 533) by the late Harvey Ellis, a man possessed of an extraordinary imagination, and combining an unusual understanding of the romantic schools of architecture with a remarkable facility in the use of brush, pen, and pencil. He designed many wonderful "pipe-dreams," and always had some equally wonderful —though at the time regarded by his friends as impracticable—idea for their construction.

"Cage" Construction.

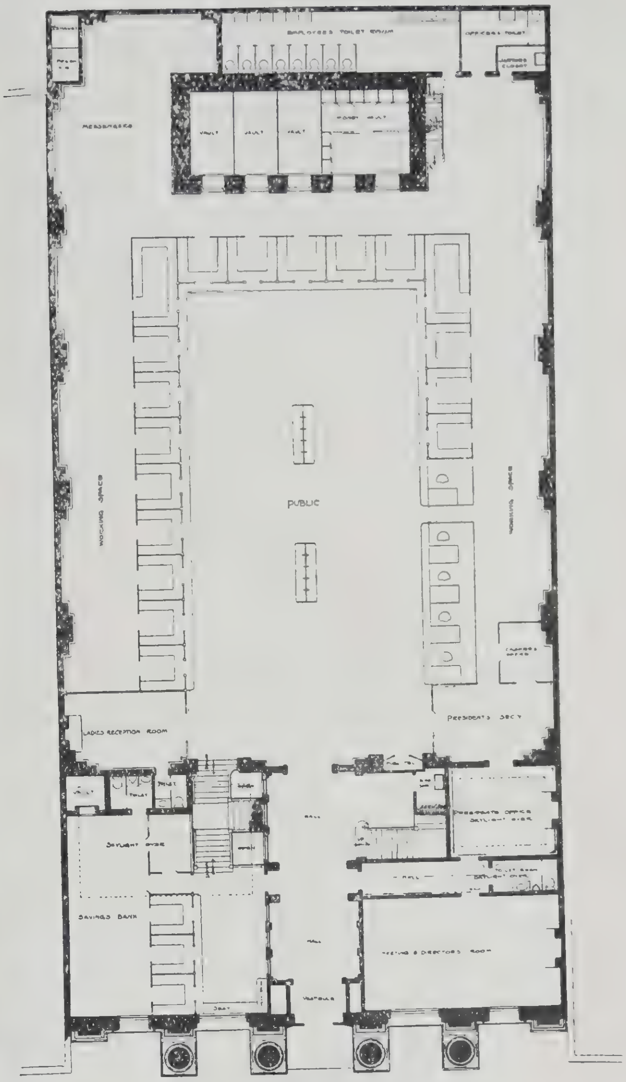
He is alleged to have been the original proposer of the "cage" construction, the modern type developed since the skeleton



ROTUNDA, OLD NATIONAL CITY BANK, NEW YORK CITY.
ISAIAH ROGERS, ARCHITECT.

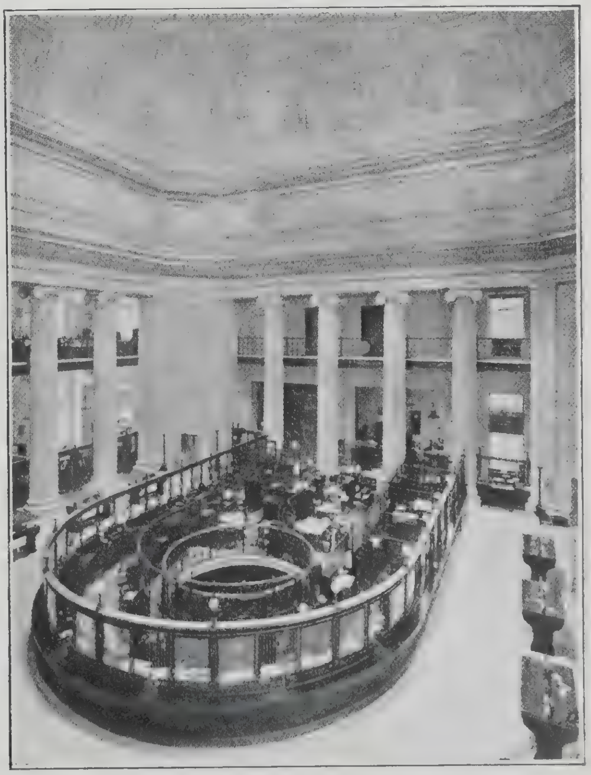


PLAN OF BANK, CLEVELAND TRUST CO., CLEVELAND, OHIO.
GEO. B. POST AND SONS, ARCHITECTS.



PLAN.

CHICAGO NATIONAL BANK, TYPE A.
JENNEY AND MUNDIE, ARCHITECTS.



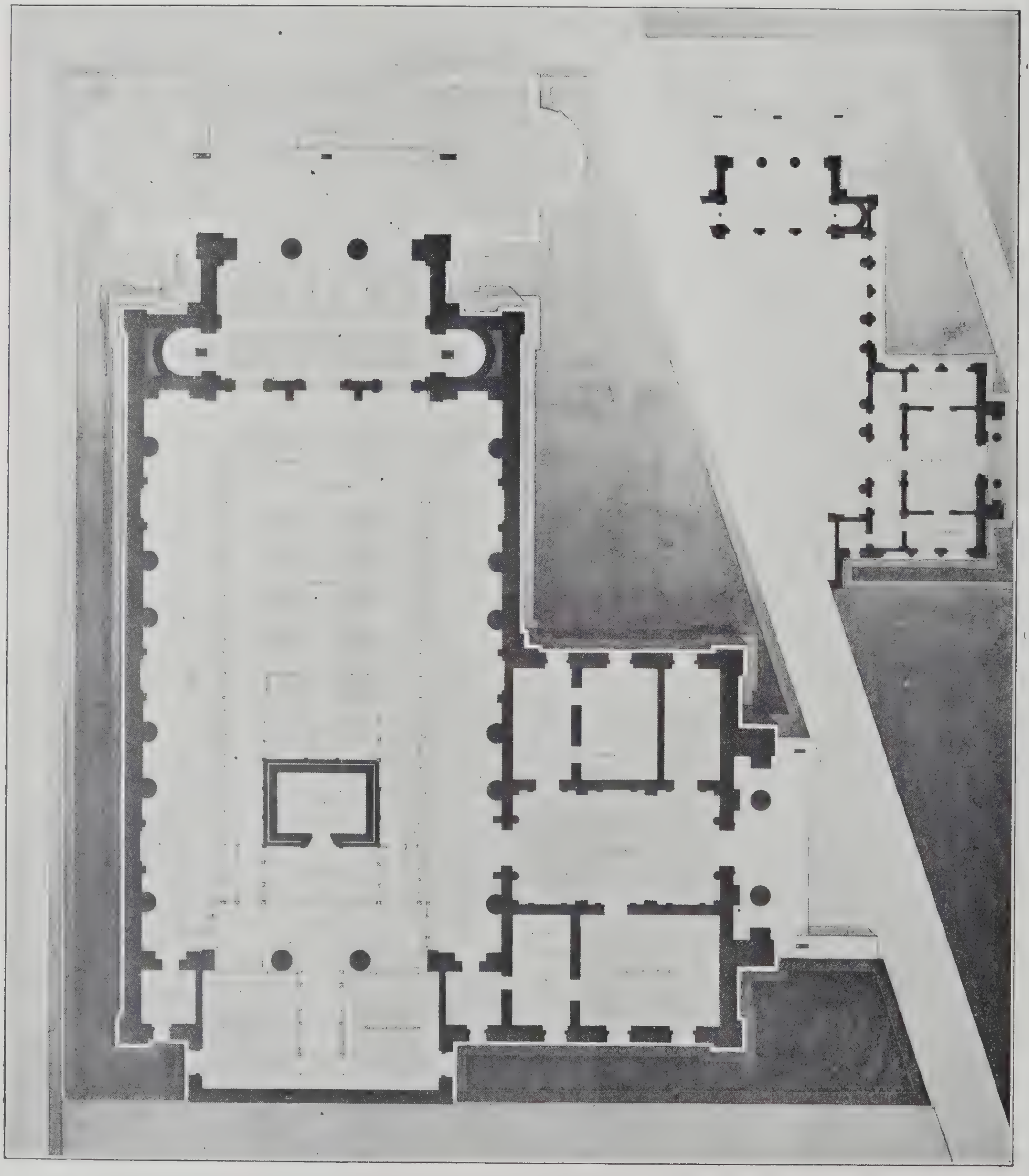
GIRARD TRUST BUILDING, PHILADELPHIA, PA: BANKING ROOM. TYPE B PLAN.

type was first used by Jenney in Chicago. This project, made in 1888, was designed in the then popular style of Richardsonian Romanesque for Mr. L. S. Buffington, of Minneapolis, who patented the idea of skeleton construction which has since been generally admitted and believed by architects and engineers to be the invention of Mr. Jenney.

Bruce Price.

Ellis's design probably owed its inspiration to the tower of the Alleghany County Court House in Pittsburg, and it was inevitable that the next design of promise—one in which Classical or Renaissance detail was proposed—should find its suggestion in another existing tower: the tower of St. Mark's in Venice. This was the fine study for a building for the New York "Sun," thirty-two storeys high to the top storey in the pyramidal roof, by the late Bruce Price (see p. 531). Though owing so much to St. Mark's, the design for the "Sun" tower was handled in a way that proved power, individuality, and high scholarship in its author. There was no attempt to imitate the buttress-like lines of the Italian tower, no effort to conceal the office windows within *motifs* suggesting bays of a masonry construction suitable only to the support of large stone vaults, which was the practice current at the time in all high buildings pretending to architecture, as for instance the Union Trust Building. It may have owed something to the design by Mr. Ellis, though it may be noted as a point of interest that the latter depends on the use of different-coloured stonework for its "values," as the painters call them—its effects of light, dark, and half-tone. In the design by Mr. Price, except for the columns at the entrances, colour does not affect these. Practically the same horizontal divisions of the height were made by Mr. Price as by Mr. Ellis. In both there are "base," "shaft," and "capital" treatment—a base consisting of three storeys, in the lower of which are the three arched entrances in each case; a high shaft with wide strong-looking corners; and all the windows exactly alike except for a narrow band of ornament and circular windows in the one case, and arched window-heads and a band of dark-coloured stone in the other. In both there is a slight entasis, from a vertical base about 10ft. high at the ground storey—in the one to the top of this band only, in the other all the way up to the base of the pyramidal roof. Above this band, again in both cases, there are two storeys, then another horizontal band which is the height of one storey; there follows what in most towers of the town hall or church type would be the belfry, composed of three storeys of offices (in the "Sun" tower these are under the colonnade), then another storey forming a frieze, over which the arched heads of the windows in the Minneapolis manner, shown in dark stone, correspond in value with the shadow under the main cornice of the design for the "Sun." In the former, however, the roof slope commences immediately above this level, but in the latter there remains a three or four-storey attic stage, crowned by a cornice and surmounted by a pyramidal roof with a small lantern topped by a bursting sun.

In this design Mr. Price doubtless gave the building an entasis for the double



STUDENT'S PRIZE-WINNING DESIGN FOR A SAVINGS BANK. PLAN, TYPE B. JOHN RUSSELL POPE, ARCHITECT.

reason of apparent strength—to counteract in some degree the optical illusion which results from a high vertical line—its appearance of leaning outwards towards the top—and obtaining room within his own boundary line for his projecting colonnade, which forms the principal feature of the "capital." This colonnade—which would be in reality a mere screen—was provided for in two ways, first by setting back the wall line above the twentieth storey, and secondly by corbelling out the main wall faces through the eighteenth and nineteenth storeys, a scheme that would have been both very picturesque and very expensive. The third, seventeenth, twentieth, and twenty-fourth storeys were to be provided with small circular windows, a scheme that was objectionable because it has been proved that offices with such windows cannot be easily let. The design was not carried out, but it may be considered as an interesting study, and as representing a beginning which has led to many of the most satisfactory steps towards the solution of this difficult problem. It has served as a precedent upon which Mr. Price based his fine design for the American Surety Company's Building at Broadway and Pine Street, which won the competition against a strong field—a competition which brought out many interesting ideas.

In this design (p. 532) Mr. Price eliminated the unpractical features of his first study, and lost some of its picturesqueness in consequence. The colonnade in the upper part was suppressed, and a row of pilasters extending through two storeys only was substituted; all the circular windows, with a single exception, gave place to practical square ones. Instead of the square lantern stage and pyramidal roof, there was only a screen wall pierced with circular openings, and capped with a cheneau rising above the main cornice; all of which tended to simplicity and added to the monumental character of the design. The most important change, however, was that of carrying down to the ground level the vertical lines of the masonry between the windows of the upper storeys, instead of the triple-arch treatment, in which the design of St. Mark's had been followed to a degree that was unsatisfactory both in design and for practical service.

In the execution of this design some changes were made. One that has considerably injured the design has been the change from the screen wall above the cornice to a two-storeyed attic. This alteration, which was made shortly before the completion of the building, so that the architect had no opportunity of thoroughly studying the change, can only be regarded as being most unfortunate. There seems to have been a doubt in the mind of Mr. Price as to whether the upper storeys ought or ought not to be crowned with the principal horizontal line. It was probably too late to suppress or reduce the main cornice as already designed, and a small cornice to the attic seems to have been felt by the architect to be inadequate. Accordingly, the cheneau was increased in size, and the upper cornice brought into competition and discord with the one originally designed. These peculiar circumstances should, in fairness, be taken into account in criticising the design, in which the architect's ideas were obviously frustrated by unforeseen contingencies.

Type the First.

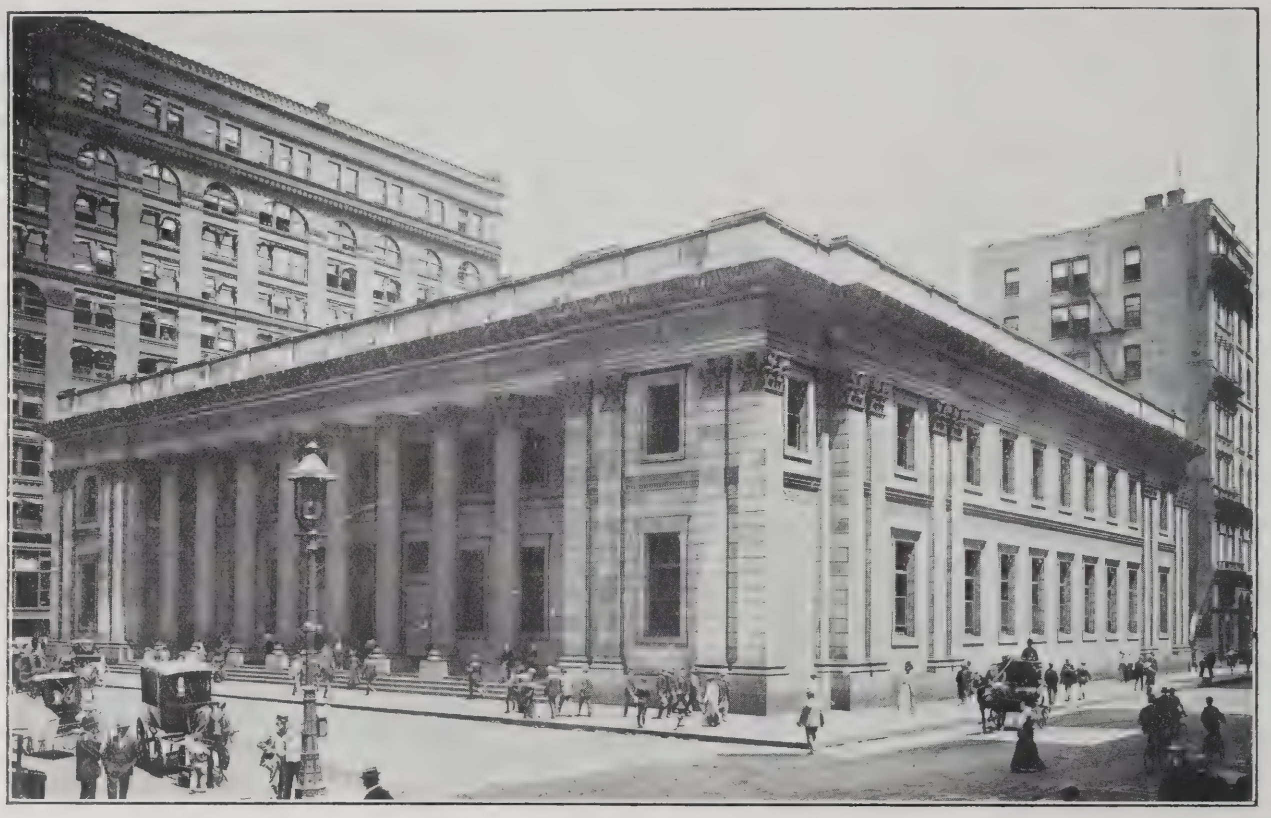
This building (p. 532) may be said to have created the first of the two types of office-building design to which reference has been made—that which is based upon the principle of the Roman column with base, shaft, and capital, there being three principal horizontal divisions. To this type belong the Flat Iron building by Burnham (p. 533), the Empire Building by Kimball and MacIntosh (p. 533), Broadway Chambers by Cass Gilbert, and the Hanover Bank Building by Baker and Ayers (p. 534); and, more picturesque but less logical and less typical, the fine marble offices of the New York Life Insurance Company in Broadway by McKim, Mead, and White, with details which for refinement and richness can be equalled only by the finest palaces of Europe.

New York Life Insurance Building.

The building of the New York Life Insurance Company in Broadway, New York (pp. 534-5), is not altogether typical of one of the forms of solution generally sought. Theoretically, it is unsatisfactory because its treatment is that of three or four buildings of three storeys each piled one upon the other; an order runs through two storeys in each horizontal division, while the third storey raises a doubt as to whether it was intended for an attic or for a pedestal. The objections, however, lose much of their force upon close examination. If we accept as an artistic solution of this difficult practical problem (which is that of a huge box full of offices all precisely alike, requiring for each office a window precisely like every other window in the building) the type of exterior treatment to which all the previously noted examples belong, we may suppose (and it is actually the case), that in several of the designs following the treatment of the accepted type the large halls, restaurants, etc., do not exist. If, then, we continue to accept any variation in the design of a *motif* where there is no variation in its functions, we must be accepting it for a reason other than because of logical expression of the plan—principally,

THE FIRST NATIONAL BANK OF PITTSBURGH
ORGANIZED
THE FIRST NATIONAL BANK OF PITTSBURGH
BUILDING

THE FIRST NATIONAL BANK OF PITTSBURG. D. H. BURNHAM AND CO., ARCHITECTS.



THE ILLINOIS TRUST COMPANY'S BUILDING, CHICAGO. D. H. BURNHAM AND CO., ARCHITECTS.

perhaps, because a horizontal division, or tie, at some short distance below the cornice, is felt to be needed to give ocular stability to these high structures; and it is only for the same reason that a similar division is made near the base, though in most cases the two lower storeys are occupied by banks or offices with special requirements. In this building there are three principal horizontal divisions, consisting of three storeys in the lower, seven in the middle, and three in the upper. Above the lower division there is a bold projecting cornice, surmounted by a bronze balustrade. A storey below this there is another horizontal band, consisting of an entire entablature, which breaks over a hexastyle columnar entrance above which are a marble balustrade with exquisitely detailed lamps continuing the vertical line of each column, and a charming group of sculpture over the two central columns. The group represents a mother eagle with its strong wings outstretched over a nest of young birds, admirably symbolising the idea of protective insurance. The fourth storey serves as a pedestal to the two-storey pilaster order above it. The seventh may be regarded as an attic storey above the same order. The tenth storey serves a like purpose to a like order, running through the eighth and ninth storeys. The effect of this treatment is that of bands running round the shaft, and serving a purpose purely decorative, much as do the bands around the shaft of the fine Column of July in the Place de la Bastille in Paris. In the upper division or "capital," two storeys are marked by a pilaster treatment similar to that in the storeys below, but the third storey (13th) is composed of semi-circular windows, the archivolts of which spring from the capitals of these pilasters. These three storeys are in effect only one, and the divisions below the arch appear as mullions and sashes rather than as individual windows. The whole is crowned by a magnificent cornice and balustrade, above which rises a kind of tower, consisting of a pedestal supporting a square lantern structure with four dials. This lantern is surmounted by a colossal group of bronze figures supporting a globe, from which an enormous spread eagle seems always about to fly. Externally—and internally as far at least as the splendid banking-room and vestibules are concerned—it is the perfection of the detail which captivates one, as well on account of the judicious placing and fitness of the ornament to the member or space which it decorates as because of the remarkable sense of scale everywhere felt and produced. It is hopeless to attempt to convey anything like an adequate idea of all this by means of photographic reproduction; only a very large photograph, and one taken from a position which it would probably be very hard to secure, could include the whole of such a building and also show something of its detail.

First National Bank, Chicago.

The impossibility of adequate representation is even more evident in a case such as the First National Bank in Chicago (p. 535), by Burnham and Polk, where both height and ground area are extensive, while the building stands upon comparatively narrow streets. This, again, is a remarkably fine building, which, however, must be seen to be fully appreciated; a great mass which rises sheer from the street as the cliffs do from the water at Dover. The proportions and detail of the cornice, and the few projecting base lines, are extremely well studied; and in spite of—perhaps even because of—the honeycomb of windows, the whole is monumental and dignified in effect. Nowhere, however, is the imagination allowed to run away with reason. Every office is planned just as it should be, expressed just as it should be, while the lines of steel stanchions and the girders between them are faithfully followed by the clothing of stone. Such a building comes as a relief among the commercial structures in any city, where one is apt to find almost endless elaboration, ostentation, and decoration; where the ornate and clever designs are so numerous as to be monotonous, and only the simple has value, by contrast, among them. Simplicity of scheme has, fortunately, been much sought during recent years in the designing of commercial buildings. Striving after complicated and "original" decorative effects in the treatment of the elevations has become less and less frequent; the "picturesque" has given way to the monumental, and the commonly accepted forms of decorative composition which dominated nearly all the earlier designs are being superseded by others of a more original—in the broad sense of the word—more vital character.

Some Earlier Buildings.

In order to trace this change, we must revert to some of the earlier buildings for comparison with later works. The view up Broadway (p. 536), showing the Manhattan Life Building in the foreground—one of the earliest of the high buildings—shows the storeys grouped in twos and threes, and the upper portion divided into towers and a dome. The façade is designed with reference to the sides, yet, apparently—since windows and an elaborate bridge, some two hundred feet above the pavement, are built in one side—it was not anticipated that another building of equal height might be built adjoining it. Beyond, in the middle distance, is the American Surety Building, already described. In this latter, each storey is clearly defined, and a single scheme of treatment is carried all round the building, while rights of light were arranged by treaty with adjoining owners. The whole exterior is of one colour and one material—in itself a very important step in the direction of simplicity.

Louis H. Sullivan.

Mr. Louis H. Sullivan, of Chicago, who, both by his work and his writings, has done much to create an inventive school of architecture in the States, seems to have been the first architect to glory in height, to have no desire to conceal or break up that height, but rather to emphasise it in his designs. His Wainwright Building, St. Louis, Missouri (p. 537), was probably the first example of the steel-frame structure in which prominence is given to the lines of stanchions and to the girders between them, and where the only ornamentation follows these structural lines. This is a building of but moderate height, being only nine storeys; above is a storey which is included in the fall of the flat roof, which latter projects boldly over the wall and protects the fronts from the rain. This storey contains the heating circuit, ventilating apparatus, storage tanks, etc., and is treated as a frieze, executed, together with the cornice, wholly in highly ornamented terra-cotta. Approximating in width the height of this frieze, the strong-looking corners—which, however, by their very slight reveals, proclaim a steel frame behind—and the broad bands of surface above and below the first-storey windows, frame-in the light lines of the mass of the building, and serve to satisfy the eye as to the stability of the whole. The two lower storeys—ground and first floors—are given up to shops, and these storeys are executed in a covering of red sandstone. The remainder of the projecting shell of masonry is of dark-red brick, which matches perfectly the ornamented terra-cotta. There is no pretence that any of this masonry shell is structural. The slender dimensions of the supporting piers, the ends of the thin courses of stone, the slight reveals, all indicate frankly that this is a construction

KNICKERBOCKER TRUST BUILDING, BROADWAY, NEW YORK. McKIM, MEAD, AND WHITE, ARCHITECTS.

KNICKERBOCKER TRUST COMPANY, NEW YORK CITY: BANKING ROOM. McKIM, MEAD, AND WHITE, ARCHITECTS.

f steel, and is merely clothed or protected against fire and the elements by the thin masonry case which surrounds it.

There are many other points of interest to study as regards this building, as in the way the details have been treated—apart from their singular originality—such as that the ornament upon the stonework is all carved into, and that upon the terracotta is modelled out from the main surface of the material. Also, that the ornament, which is so slight in its projection in the lower storeys as to seem almost the natural texture of the material from which it is cut, increases gradually in projection the farther it recedes from the eye. It may be objected that the alternate piers in this building do not contain a stanchion, but are as large in their dimensions as those which do. Obviously this arrangement was adopted with the object of preserving the unity of the design, and of exaggerating the apparent size of the structure by the effect of multiplicity of a single motif.

In his late designs, such as the Condict Building in Bleecker Street, New York, Mr. Sullivan has obviated nearly every criticism which may be made upon rational grounds, and here also may be seen some of the most highly interesting of his marvellously complex and fascinating ornamental detail. (Pages 538-40.)

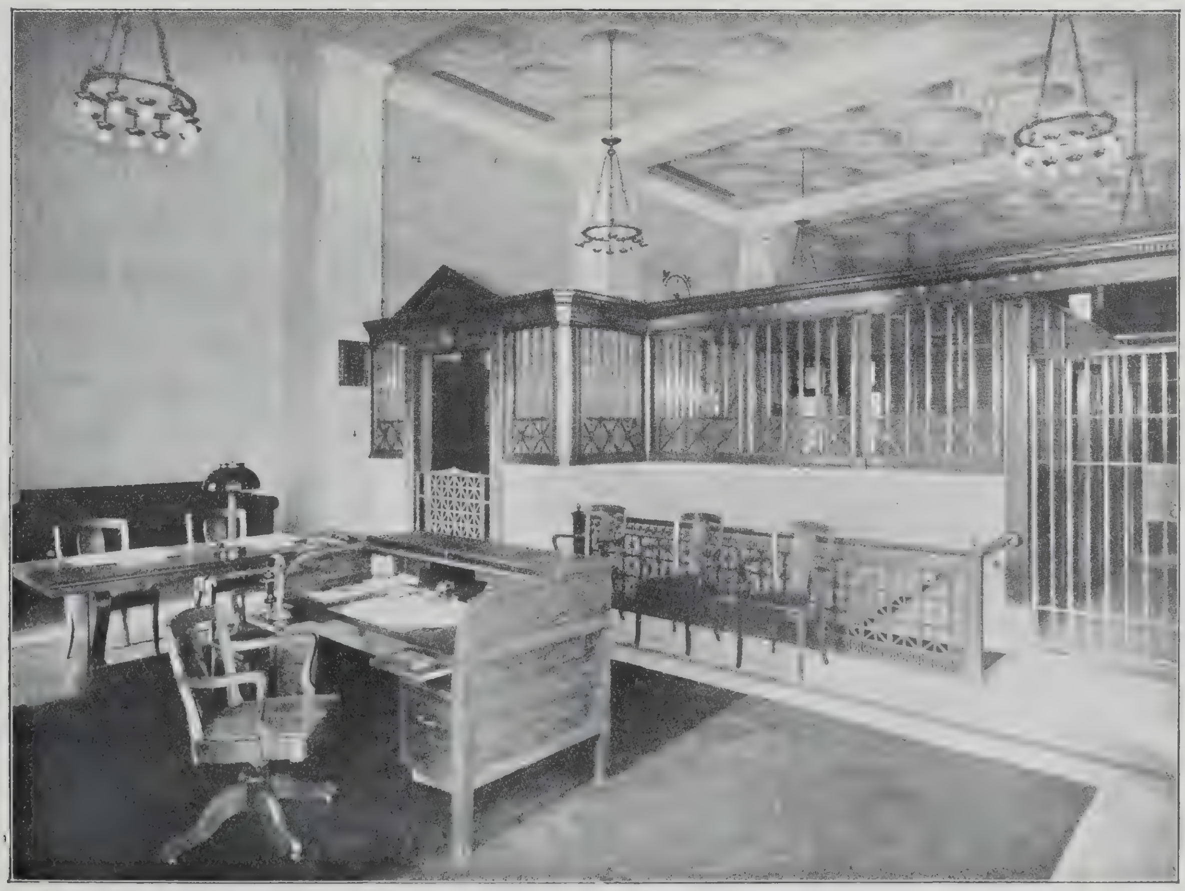
Among the best of the picturesque examples which were characteristic of the work of ten to twenty years ago, may be mentioned the buildings of the American Baptist Publication Society, by Frank Miles Day, and the Harrison Building, by Cope and Stewardson; the City Trust Building, by Wilson Eyre, in Philadelphia; the Fiske Building, by Peabody and Stearns, in Boston; the Wolfe Building, in Maiden Lane, by Henry Hardenbergh, the "Mail and Express" Building in Broadway and Fulton Streets, New York (pp. 539-42-43); this last building, the work of Carrère and Hastings; is especially interesting on account of the extreme narrowness of the Broadway front, which is only about twenty-five feet wide, and the very great difficulty of treating such a façade, which must be almost filled with windows, and six or seven times as high as it is wide. In this case the architects have produced a decorative treatment which is immensely clever and sprightly; they have tossed to the winds all theories which demand expression of the plan upon the façade or call for the limitation of ornament to the decoration of constructive parts. There is no suggestion of the iron structure of the building; there is only a plain wall of stone with openings for light, or where required to assist the decorative balance. The decoration is constructed outside of and upon the wall which serves as a background; it starts with four caryatides supporting a broken straight pediment, through which rises a framed, curved-pedimented window, at the sides of which the wall behind is rusticated and forms a pedestal storey to two superimposed orders, each running through two storeys. Above the upper tier, the seventh storey is treated as an attic. This again has a broken and curved pediment, from the tympanum of which projects the small balcony to an arched window adorned with Corinthian columns at each side, and covered with a pediment; the windows at each side of this large one, and those in the storey above, are comparatively plain, and between the windows very flat pilasters extend through both storeys, and terminate in cartouches under an elaborate cornice with a richly detailed cheneau, which serves as a railing to the balcony thus formed above this cornice, which is in effect the principal cornice to the building. The next storey, which is a high one with an arched central opening and double columns at each side, is in the nature of an attic to the whole structure; but there is an attic to this attic, having a pediment in the centre with a rich cresting. The ends of the side walls extend above this, and terminate as a sort of plinth to pedestals supporting elaborate vases. The building is finished with a high square mansard, from which rises a light and graceful octagonal tower of two principal and two intermediate stages, carrying a flag-pole and weather vane. The transition from square roof to octagonal tower is managed with the cleverness which characterises the whole design.

The simpler and less successful façade on Fulton Street is open to much the same sort of criticism (but not in the same degree) as the Manhattan Life Building, and on the whole this building leaves much to be desired. It adds nothing new to architecture, and it avoids rather than helps to solve the problem which the office building presents. In their essay in the competition for the American Surety Building, the same architects struck a much higher note, and the design of those storeys, which may be termed the "shaft" of the building, has had a material influence upon many of the designs which have lately appeared. Their Blair Building, New York, a still later study, in which bays of iron, separated by narrow piers of stone, are crowned with a bold projecting cornice cast in iron, is one of the most successful of all the designs which have thus far appeared among those which may be considered as being dignified by the inspiration of a conceived ideal.

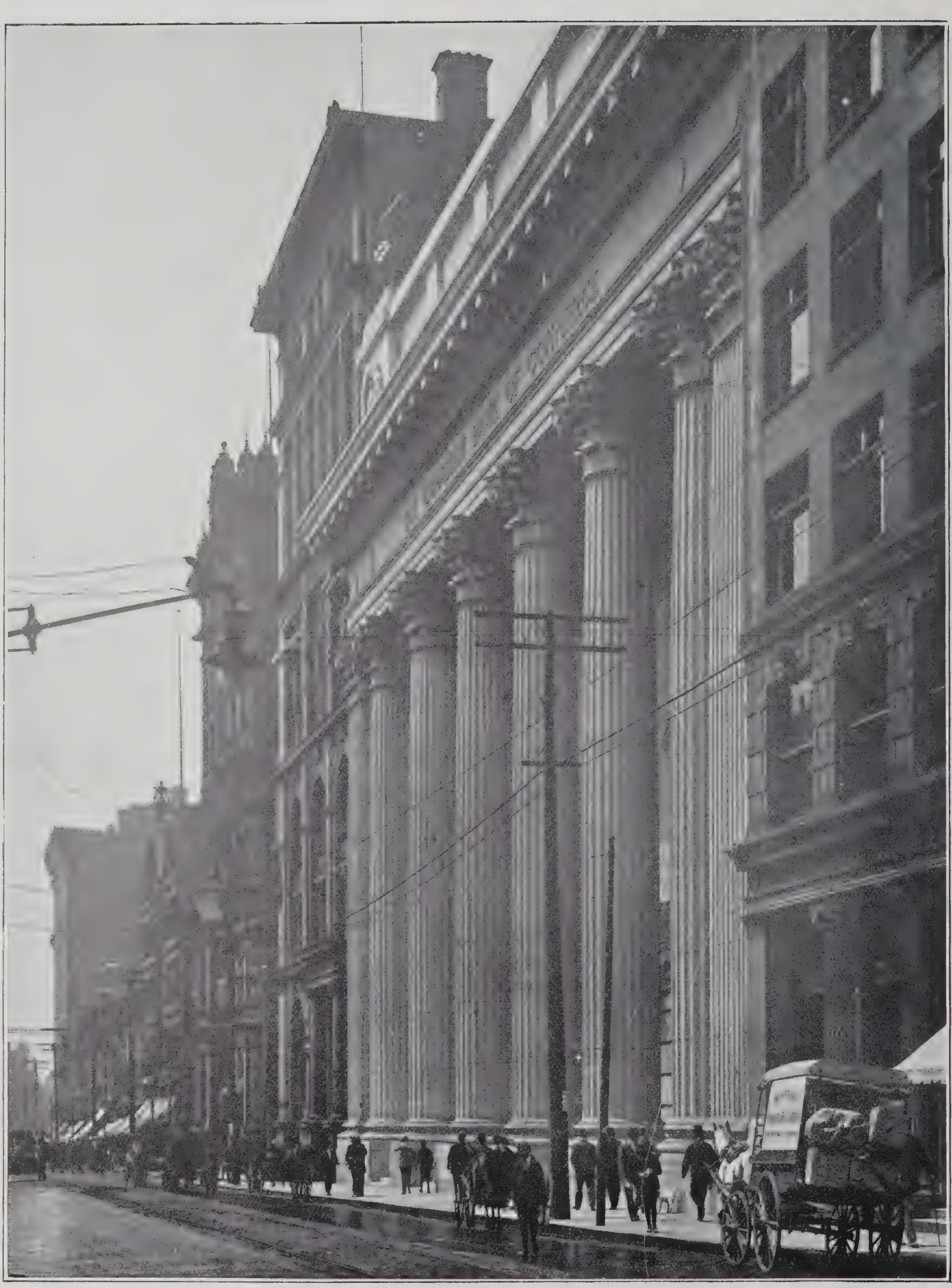
Ernest Flagg and the Singer Building.

Mr. Ernest Flagg, in his design for the Singer Building, built ten or twelve years ago, adopted the expedient of a colossal window treatment extending through two storeys, and has so divided this building horizontally—by the employment of a projecting balcony, which partly screens the fourth storey, and by a heavy cornice, which includes a storey between its consoles, with a balcony rail above it, which also screens the ninth storey—that the first impression created is that it is composed of four or five giant storeys, an impression which is further strengthened by the combination of red brick with black mortar joints, and by the white stone in which all architectural features are executed. The detail (p. 543) is strong and clean, and very monumental, but the design is at fault in suggesting large halls where none exist. Less impressive, but more satisfying to the analytical mind, is his Produce Exchange Bank Building, at the corner of Broadway and Beaver Street, in which the only lines that are not constructive are two balconies, one in stone and the other in iron, which divide the height into contrasting horizontal and vertical rectangles. It is an ironical circumstance that Mr. Flagg—who, perhaps more than any other architect in the United States, had for some fifteen years persistently condemned the high building altogether—is the architect of the highest completed commercial structure in the world—the tower, 609ft. high, and containing forty-one storeys, of the new Singer Buildings.

The tower of the recently completed Singer Buildings is treated as a great campanile, and finished with a dome, and a tower at the corner of Madison Avenue, Twenty-fourth Street, will complete the buildings of the Metropolitan Life Insurance Company on the site reaching from Twenty-third to Twenty-fourth Streets, and from Madison Avenue to Fourth Avenue. This building or group of buildings (p. 545), if which the first portion—at the corner of Madison Avenue and Twenty-third Street—was completed some twelve years ago, is extremely elaborate in its details, which are studied from the most florid examples of the Renaissance in Spain. It was designed originally, by Le Brun and Sons and Masqueray, to be carried out in terra-cotta, but the owners changed the material to white marble. This building, the tower of which is to be forty-six storeys (660ft.)



KNICKERBOCKER TRUST BUILDING: OFFICERS' ROOM. McKIM, MEAD, AND WHITE, ARCHITECTS.



THE CANADIAN BANK OF COMMERCE, MONTREAL: GENERAL VIEW OF THE EXTERIOR. FRANK DARLING, ARCHITECT.

high, faces Madison Square at its south-east corner, the tower being at the corner of Twenty-fourth Street; at the north-east corner (Twenty-sixth Street) is the Madison Square Garden, with its tower 350ft. high. The tower of the former structure, like Mr. Price's design for the "Sun" building, follows in its principal lines those of the former campanile of St. Mark's, while the latter is a lighter and graceful restudy by the late Stanford White—Italian Renaissance in the style of its details—of the Moresque and Renaissance combination which makes up the beautiful tower of the Giralda at Seville. Between Twenty-fourth Street and Twenty-sixth Street is a row of structures of but a few storeys—two to four or five—among which is the splendid Madison Square Presbyterian Church.

Some Speculative Buildings.

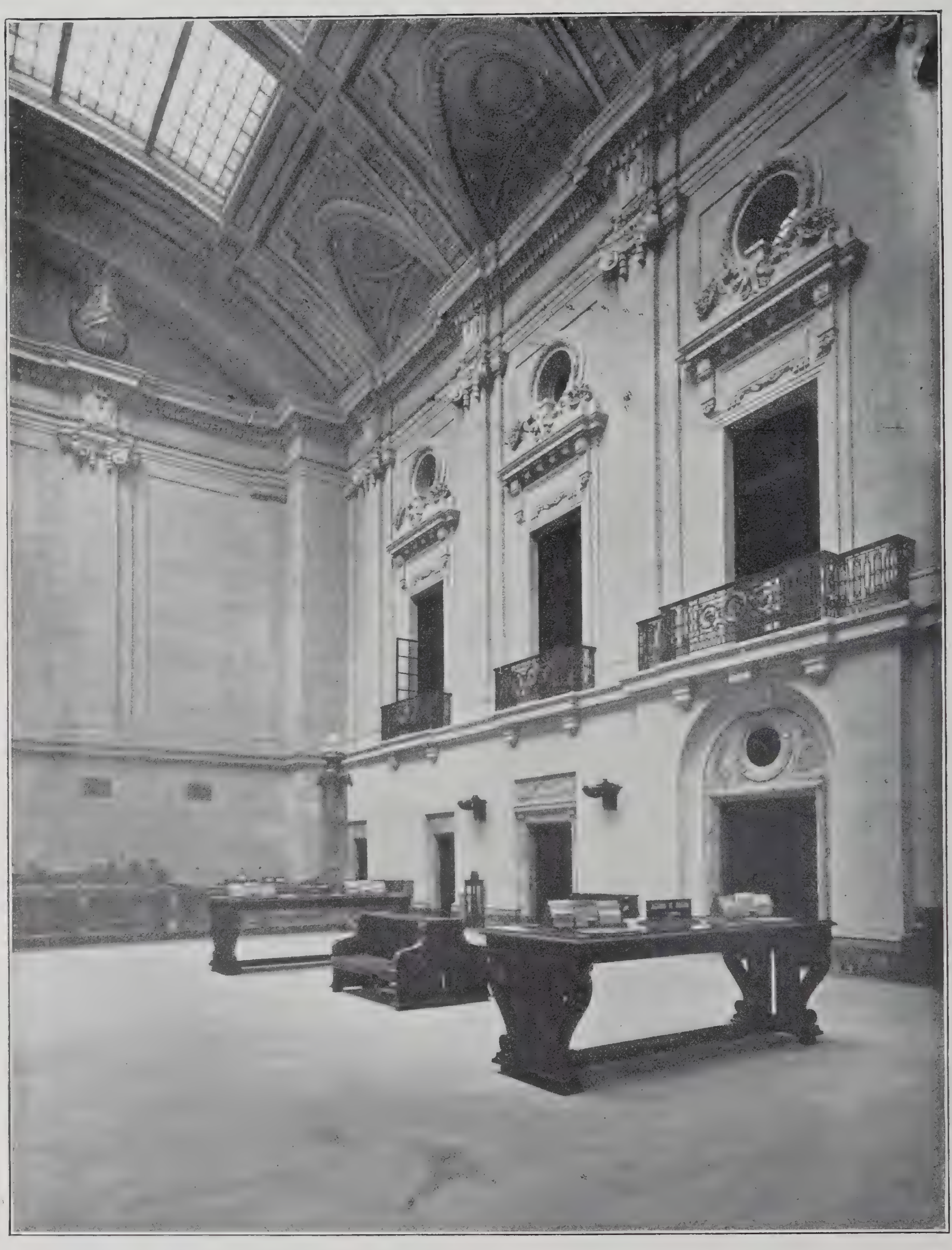
So long as very large commercial companies continue to come into existence, no doubt also will very high buildings continue to be built within certain restricted areas in commercial centres in America. Whether such structures as the Singer Tower (p. 585), with such a small ground area (it is only 65ft. square, or thereabouts), will prove practical office buildings for the large companies, must be regarded as doubtful; but similar towers will probably in the future provide space for the brokers and professional men, who do not require great floor space, and thus relieve much of the competition for ground area in the congested districts, making it possible for the banks, exchanges, and smaller companies to have their offices in their own buildings, an object which is desired by nearly every good business institution, but which, with the present high value of property in lower New York, can seldom be attained. One may see at the extreme southern point of the island (p. 546) a number of examples of the buildings erected by speculative companies for letting. One might consider the old Washington building at the Battery as a safe conservative investment, and the building as being not devoid of architectural interest. The Bowling Green Building, which adjoins, is one of the early examples of the speculator's work, while the West Street building is one of the latest and most degenerate. It is these latter which it may be hoped the tower type will ultimately supplant. The new Customs House, designed by Mr. Cass Gilbert (p. 587), also at the Battery—cannot, we imagine, fail to create an influence for the better upon the architecture of the houses of the more conservative institutions in this locality.

Lights and Shadows.

As examples of the lights and shadows of the high-building question, the Wolfe Building, New York (p. 542), by Mr. Henry Hardenbergh, which enlivens a dull and monotonous neighbourhood, may be taken as belonging to the former, while the Frick Building in Pittsburg falls under the latter category. The Frick building has been built directly opposite the principal front of the celebrated Court House, which is one of Richardson's greatest works—perhaps his masterpiece.

As to the interiors and finish of these high buildings, the ordinary offices are

THE CROCKER-WALWORTH BANKING HALL, CROCKER BUILDING, SAN FRANCISCO, CALIFORNIA. A. PAGE BROWN AND JULIUS SCHWEINFURTH, ARCHITECTS.



CANADIAN BANK OF COMMERCE, MONTREAL: INTERIOR OF THE BANKING HALL. [FRANK DARLING, ARCHITECT, extremely plain, without cornices, with direct radiators in front of each window, exposed lavatory basins in each room, sometimes built in what in this country would be called a "cupboard," but in the States is called a closet. The floors and doors and other joinery are usually of oak, occasionally of mahogany, and are almost invariably finished with a dull polish. The door furniture—plates, handles, latch, and lock—is all combined in a single fitting, and black iron or bronze is usual, brass being seldom employed and copper almost unknown. The corridors and stairs, and all halls or other places used by the public, are of marble White marble floors, and four or five feet of the walls are wainscoted in the same material for the corridors, and marble mosaic floors, often beautifully designed, with the walls treated in coloured marble panelling, may be taken as the rule for the entrance, lift, and other principal halls. The elevator (lift), screens, balustrades, counter-grilles, ventilating registers, etc., are of black iron, bronze—often with a beautiful green finish—or brass, but nothing if not rich and elaborate in design (p. 574). The principal rooms, such as the banking, dining, directors', etc., are at least pretentious (see pp. 566-7-9), though often above that description. Rich material, excellent workmanship, carvings executed by skilled artisans (from highly finished full-size details made in the architect's offices), elaborate and well-studied plaster decorations—especially the ceilings—are characteristic. Occasionally painting, sculpture, and stained glass, by the ablest artists obtainable, are also introduced. Yet that any of this work is likely to be preserved for its beauty is improbable. Much of it is doubtless worthy of preservation, but to anyone who knew the fine new waiting-room of the Grand Central Station in New York, and its brief existence, it will seem improbable that any commercial structure is not in danger of demolition at the end of a few years to make way for "improvements."

Insurance Buildings.

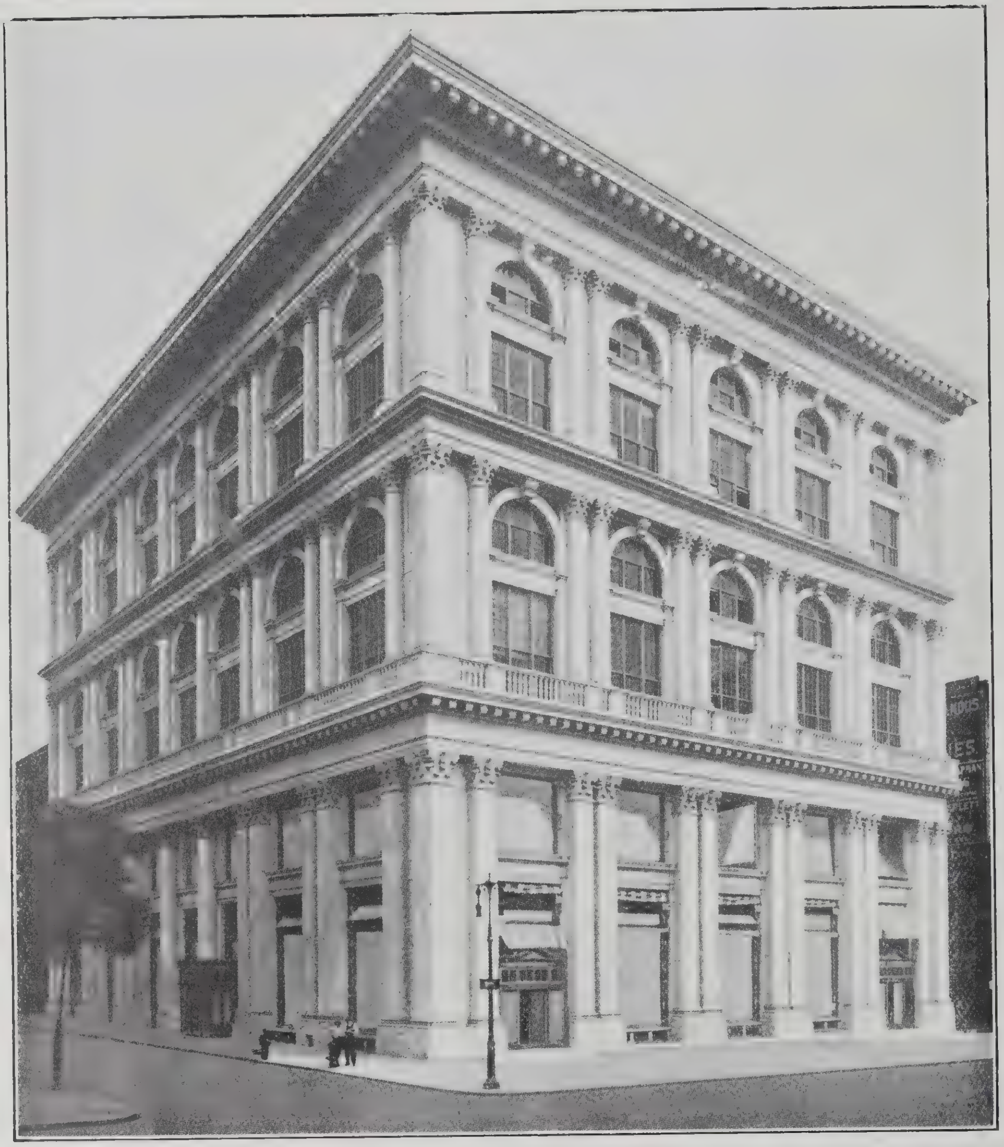
Architecture as a means of advertisement is well known to and understood by the insurance companies, and many of the best examples are due to this recognition. A fine building—one that gives the impression of judgment and taste upon the part of the directors—imparts the idea of stability and strength as a sound financial institution to the ordinary policy-holder far more than a huge list of figures which he does not pretend to understand. One sees in the huge tower of the Metropolitan Life Building in New York, and the enormous group of Prudential buildings in Newark, this striving after the attention of that section of the public who insure with the "industrial" companies. The same may be said of the proposed sixty-odd storeyed juggernaut which Burnham and Co. have planned for the Equitable of New York, though in this case the advertisement will appeal to many as being a questionable asset. Surely one must feel more confidence in a management which keeps to such simple, strong, and conservative buildings as that of the Mutual Life new building by Mr. George B. Post, in Newark (p. 546), and the American, by Mr. Gilbert, previously mentioned, also in Newark. Although the number of small office buildings in New York occupied wholly by a single company, may not, from the unobtrusiveness of such buildings, appear to be very large, they are in fact very numerous, for here and there throughout the city one comes upon some little building, such as one might expect to find in an old European city—quiet in design, built for a practical purpose without desire of blatant advertisement, and without stint. Pleasant it is to come upon such a building as the offices at Broad and Pearl Streets, by Mesrs. Kirby, Petit and Green, with its agreeable interiors, finished in natural wood.

Small Office Buildings.

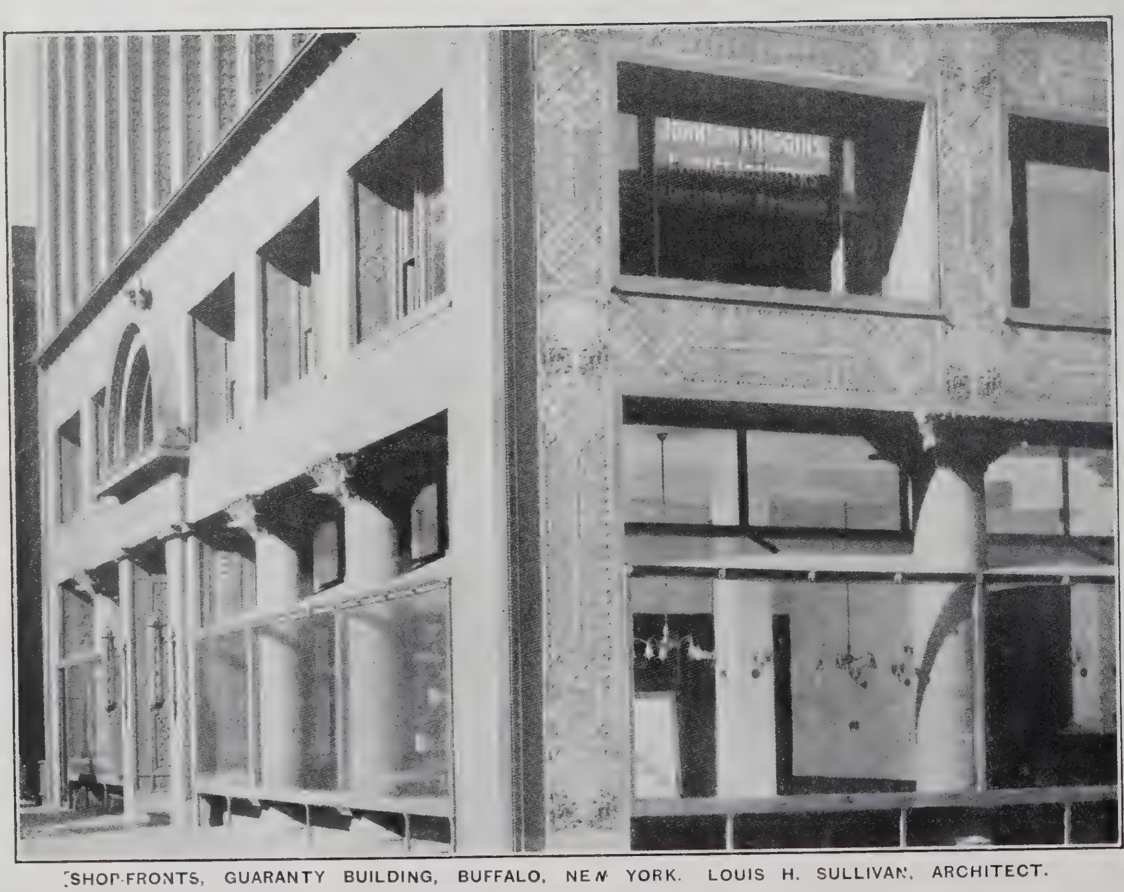
In other cities, as Baltimore, Philadelphia, Boston, etc., these small office buildings are not infrequently among the most interesting of the town's architectural ornaments. The little building at Walkerville, Canada, opposite Detroit (p. 548), is the most important architectural work in the town, while the charming detail of the sprightly offices of a piano company in Boston could not fail to attract the attention of any lover of good architecture. (p. 550). The Metropolitan Insurance Building in Baltimore, by Messrs. Le Brun, is as appropriate to Baltimore as it would be to Bloomsbury (p. 545); and the little building containing the offices of Berry Brothers in Detroit gives life and colour, and brought about material improvements to a street which was formerly a muddy lane leading to a row of varnish manufactories.

The New York Stock Exchange (p. 602), designed by G. B. Post, between Broad Street and New Street, with a side entrance in Wall Street, was erected in 1901. It is built of white marble, and shows much originality in both design and construction. It was necessary to make

CANADIAN BANK OF COMMERCE, MONTREAL: INTERIOR OF THE BANKING HALL. FRANK DARLING, ARCHITECT.



TIFFANY BUILDING, FIFTH AVENUE, NEW YORK CITY. McKIM, MEAD, AND WHITE ARCHITECTS.



SHOP-FRONTS, GUARANTY BUILDING, BUFFALO, NEW YORK. LOUIS H. SULLIVAN, ARCHITECT.

the great hall in the Exchange as large as possible, and to provide it with the maximum amount of diffused light, and these objects were attained by making the colonnades at the ends of the hall on its two street fronts form the end design of the hall, with continuous screens of glass behind them. A full account of this remarkable building was given at p. 182 of the "Builders' Journal" for September 8th.

Banks.

The Mutual Benefit Life Insurance Building, Broad Street, Newark, another of Mr. Post's buildings, repeats the device used in the New York Stock Exchange of placing large free-standing columns in front of a glass screen. Here the columns are of the Corinthian order, and are four storeys high, supported on a base and crowned by an attic. The exterior of the building is of marble, with window screens of copper treated in imitation of bronze. The main façade is that to Euclid Avenue, where a colonnade of eight fluted columns carries a pediment containing some fine sculpture by Karl Bitter. The entire first floor is given up to the great rotunda-like banking-room and its dependencies. This room is 61ft. in diameter, and rises to a clear height of 85ft., and has a leaded glass dome. It is finished in marble and bronze, which produces a harmonious and rich effect.

Another fine classical design (by Mr. Post) for a bank is that of the Howard Savings Institution at Newark, N.J. (p. 547).

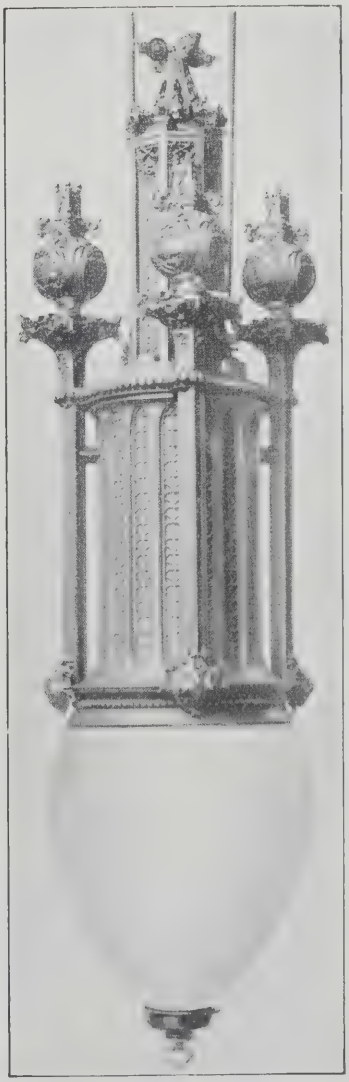
IV.—Shops and Stores.

Two things above all others are essential to a shop—floor space and light. If one of the two has to be sacrificed, it must be the light, because 100 sq. ft. of space will pay for several lamps, while one 25-c.p. lamp will light that area. But in America—where the law of easements as regards ancient lights is unknown, and a building must be so designed that it shall be sufficiently lighted regardless of how high structures on neighbouring property may be carried—small and ordinary sized shops depend for daylight almost entirely upon the amount to be obtained from the street in front and the alley at the back, and if this fails, electric lamps must supply the deficiency. In the larger shops there are, of course, central light-wells or areas; in the old-fashioned ones these open spaces were the ordinary area surrounded by brick walls and having skylights formed over the ground storey. In the more modern ones, however, the French scheme of an open space running through several storeys, with a dome or glass roof at the top, is adopted, as in Altman and Co.'s store in New York, which is an early example, and consequently is not representative American architecture of to-day (pp. 580-1).

The American Shopkeepers' Needs and Notions.

Unlike the French shopkeeper, the American does not hang rugs and draperies over the balustrades and in the area in defiance of risk of fire, but reserves it as an agreeable, open, architectural feature, in which a fountain and palms are often placed, and sometimes an orchestra; and the effect is not unlike the Mexican or Spanish *patio*. It will be noted that in the illustration the shades are drawn to assist the photographer, hence the effect of darkness, which is the reverse of the actual effect, which is one of bril-

GORHAM BUILDING, FIFTH AVENUE, NEW YORK CITY.
McKIM, MEAD, AND WHITE, ARCHITECTS.



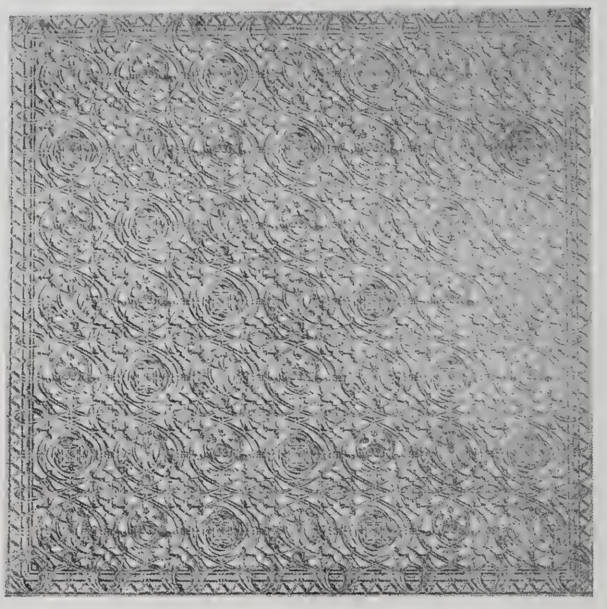
ARC LAMPS: DETAIL.
LOUIS H. SULLIVAN, ARCHITECT.

liant illumination, whether by day or night; and the effect of a radiator placed around the lower part of a column is unpleasant to observe. Each floor is open throughout its whole extent—that is to say, it is never divided into small compartments by brick walls, as required by the Building Acts of London. Fire protection is afforded by automatic alarms and sprinkling devices; ready access to all parts of the building, ample aisles between the counters, plenty of entrances and exits, high ceilings and mechanical ventilation—which can be relied upon to be working—make it easy for firemen to cope with a small fire, provide means of escape for employees and visitors, and reduce danger from smoke to a minimum.

The height of storeys is usually from about fourteen feet in the upper storeys to as much as twenty-five feet in the ground storey, and the skylights are provided with wire-glass and arranged on rollers to open automatically in case of fire, as well as in the ordinary way under usual conditions. What few partitions are required for offices and special departments are principally of glass and iron, or bronze grilles and frames; show-cases are entirely of glass, and stand upon metal bases. Staircases and lifts—there are often several of the latter—are entirely of incombustible material. The stairs—risers, treads, and inside skirting, and the walls adjoining, when the stairs are not free-standing—are of marble, the outside strings and newels of ornamental cast-iron, and the stair railings or balustrades of cast or wrought iron. Floors of marble mosaic or rubber tiling and metallic shelving are employed in the latest structures, and only the counter-shelf and hand-rails to the stairs are of wood. Window frames are of iron or bronze, doors of glass and iron or bronze.

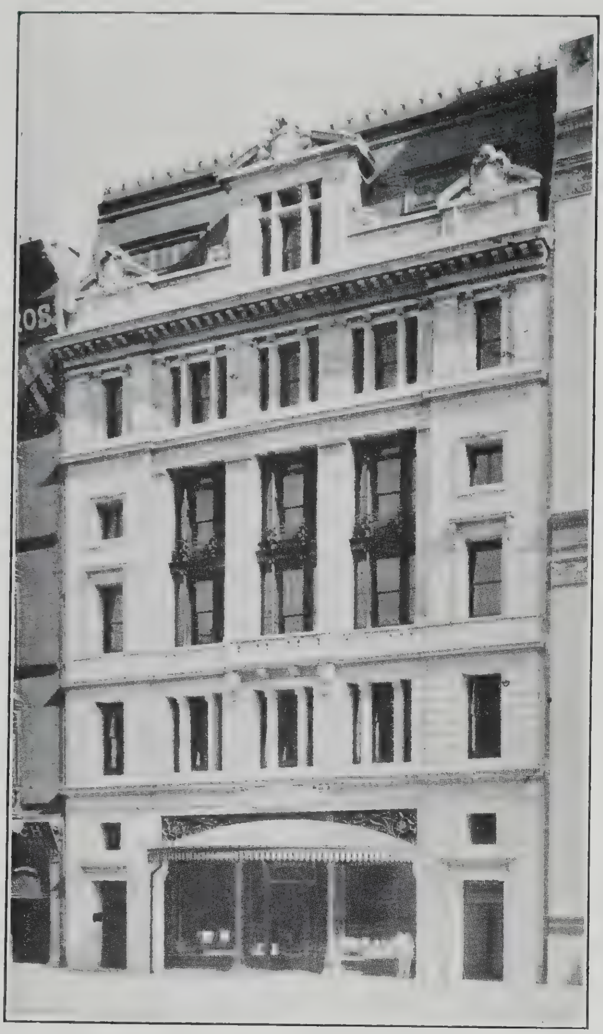
The Planning of Shops.

As regards planning, in the smaller shops of the "sandwich" type—that is, the narrow lot between two others with a frontage to one street only and the back to the "alley" (a narrow roadway between two streets provided for the use of the dustman and delivery vans), there is but one aisle, and the front door only is used by the visitors; but the back door, used for the reception and dispatch of goods, could be used as an emergency exit. Whenever possible a complete circulation is desirable, and an experienced shop manager will invariably insist upon it if there is the opportunity. By a "circulation" is meant a complete "ring" of aisles so arranged that when a visitor has passed down one aisle he or she will follow a turn and go out by another. "Dead-end" aisles are, as they ought to be, discountenanced; ground-floor aisles with only a stairway to another storey at one end should be considered as having dead-ends. In shops of the "popular" class, occupying a corner site, entrances are usually arranged away from rather than at the corner, as it is considered desirable to have a long series of shop-fronts unbroken by entrances, and the latter are only introduced at a corner when the frontages to both streets are extensive and three or more entrances can be used to advantage. Most of the very large shops occupy the half or whole of a city square; thus the Marshall Field retail store in Chicago is about one hundred and fifty by nearly three hundred feet in ground dimensions, and is thirteen storeys high. In such a building, unobstructed by cross walls, and with the columns spaced about twelve feet apart in one direction, and twenty-two the other, with two great open wells about forty by



BRONZE SCREEN: DETAIL. LOUIS H. SULLIVAN, ARCHITECT.

DRESSMAKER'S PREMISES, FORTY-SIXTH STREET, NEW YORK CITY.
WARREN AND WETMORE, ARCHITECTS.



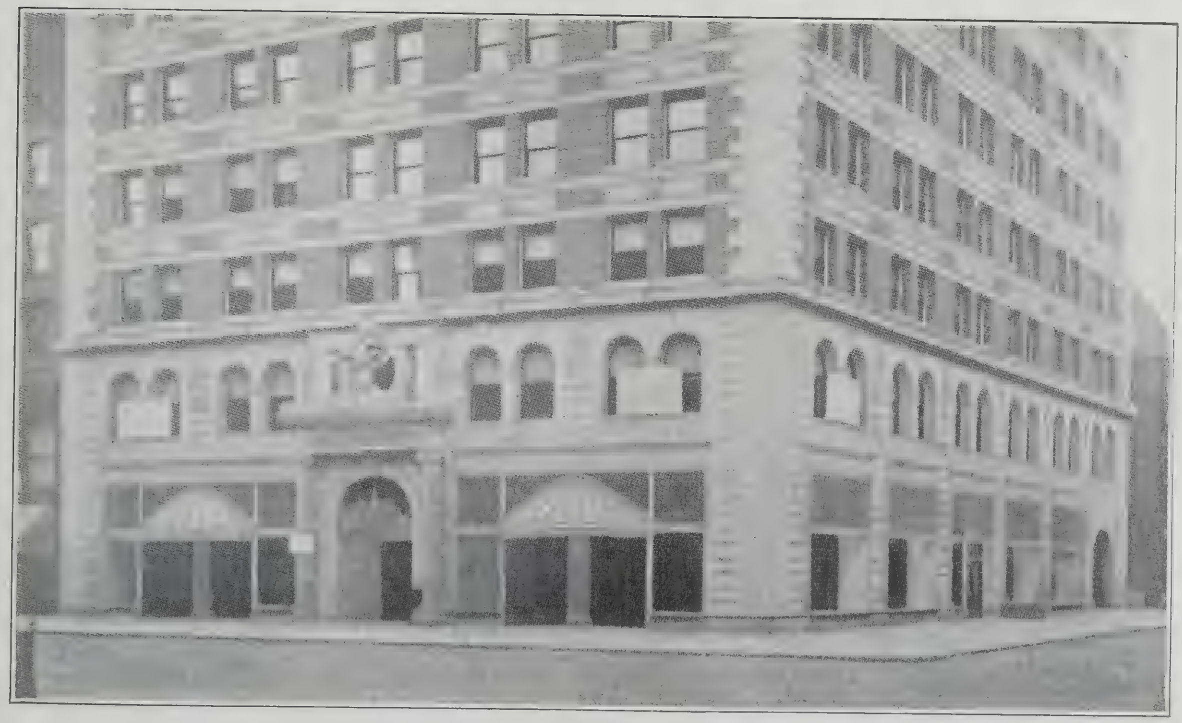
SCRIBNER'S BOOK SHOP, FIFTH AVENUE, NEW YORK CITY. ERNEST FLAGG, ARCHITECT.

sixty feet, and all the storeys high and the aisles wide, circulation is as easy as in the streets outside, and the open effect is almost that of a great market. Twenty-six pairs of swing doors and four revolving doors provide means of entrance and exit to and from the ground floor, while three principal staircases, each seven feet wide, twenty-six passenger lifts, and six goods lifts, provide communication with the floors above and below; several supplementary staircases communicate with the basement.

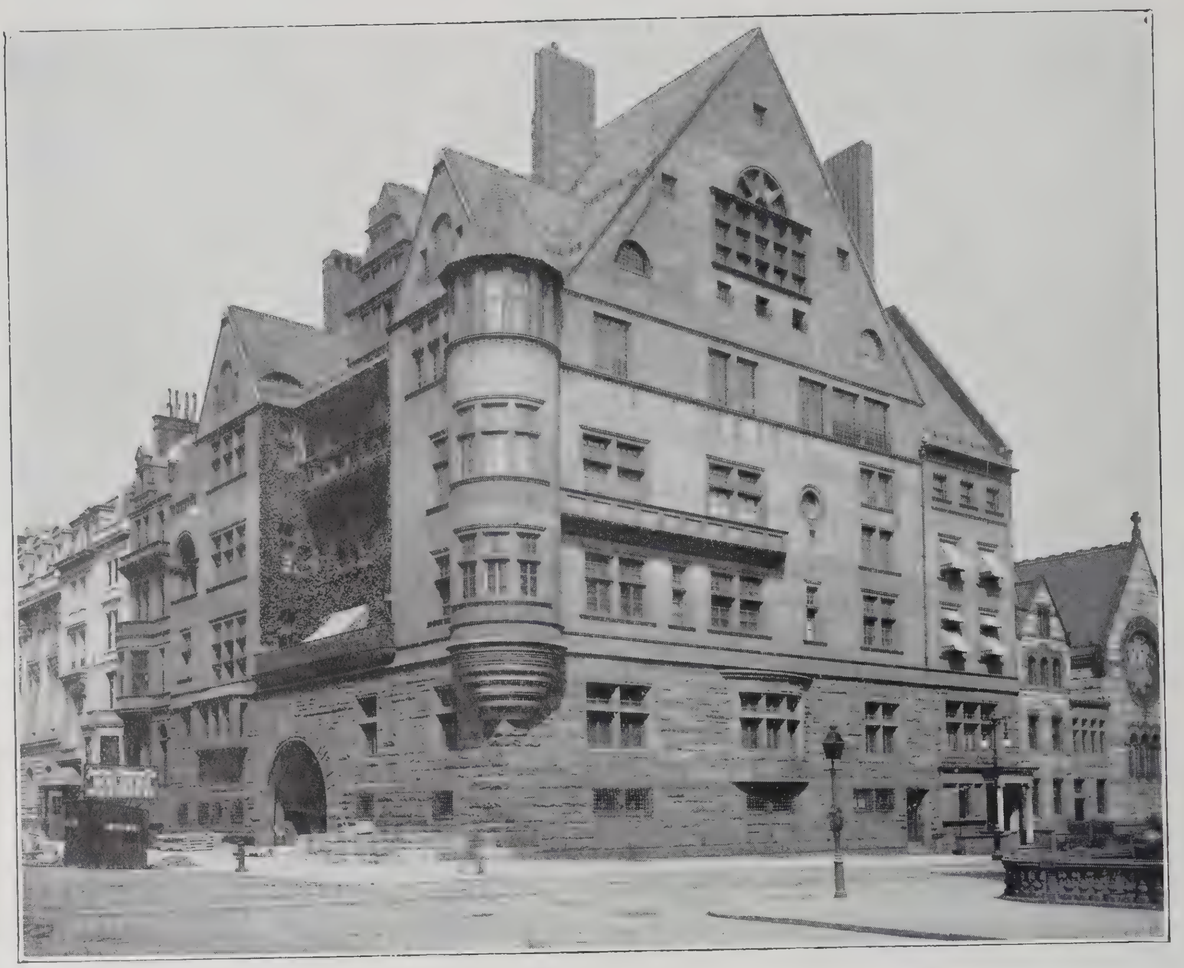
As architecture, this great pile is uninteresting. It is designed with no regard to beauty. Much the same might be said of the vast Wanamaker shops in New York and Philadelphia; and yet they are much better than such structures as the Siegel-Cooper shop in New York. Except for some of those recently constructed in Chicago, such as that for Schlesinger and Mayer, of which Louis H. Sullivan was architect, none of the "popular" class shops can be compared with the Magasin au Printemps or the Bon Marché in Paris, or some of the new shops in Berlin, nor with the Selfridge Building in Oxford Street, London. But with the more exclusive trades, such as the book, dressmaking, and silversmiths' shops, it is quite another matter.

Typical Shop Architecture.

The little shop in Forty-sixth Street (p. 574), used as a dressmaking shop, would hold its own in Mayfair, but is not in any sense quite typical of American shop architecture; but the shopkeeper can only be educated slowly. One of the earliest of this class of buildings to possess any architectural merit was the Scribner Building in Fifth Avenue, New York; one of the early works of Mr. Ernest Flagg, it would not be out of place in the Rue de la Paix. It was one of the first to express an idea as to the proper treatment of a masonry front, in which great holes must



SHOP-FRONTS, ST. JAMES BUILDING, NEW YORK CITY. BRUCE PRICE, ARCHITECT.



TIFFANY HOUSE, NEW YORK. McKIM, MEAD, AND WHITE, ARCHITECTS.

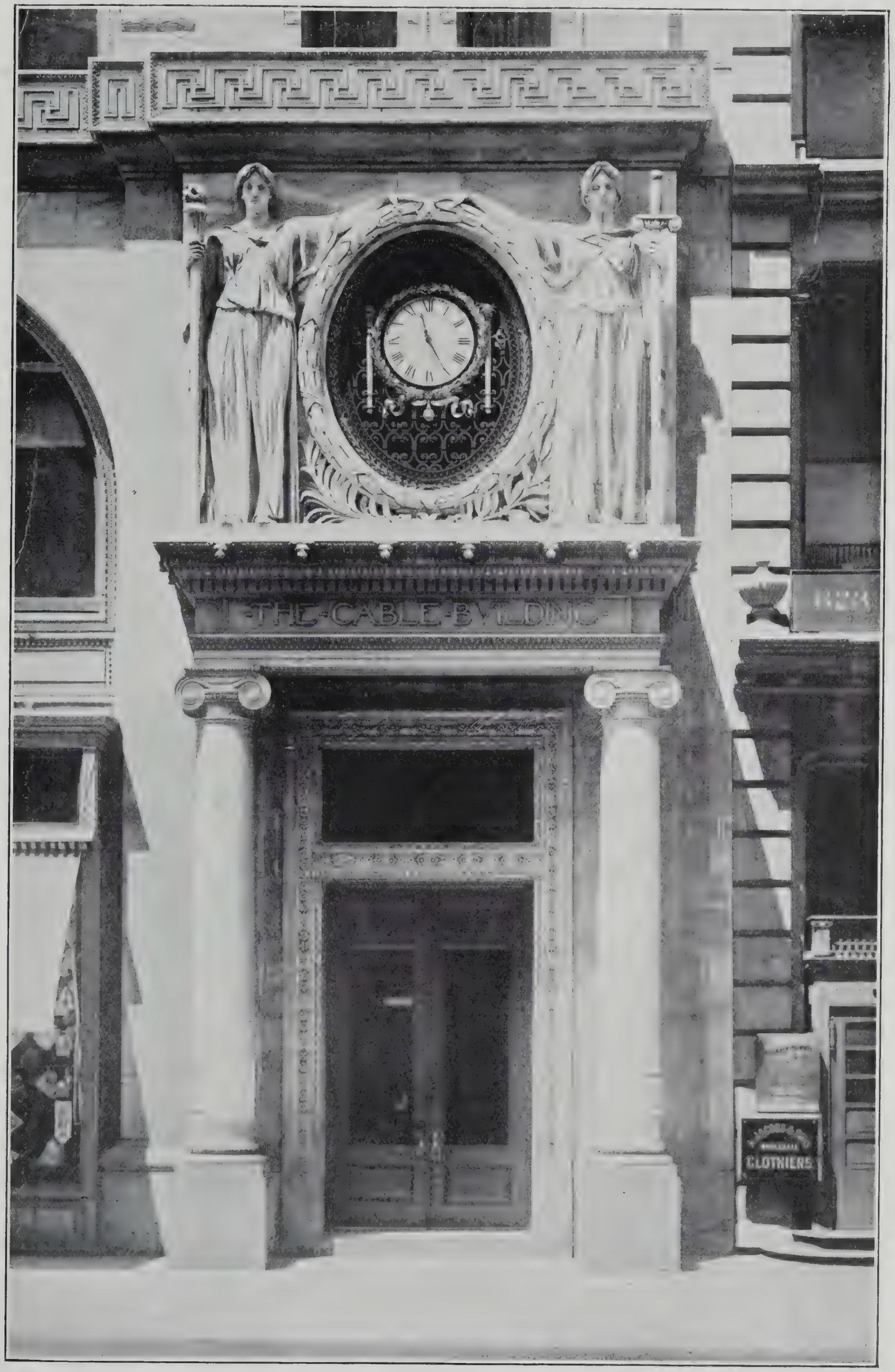
be made for light, and the largest of these holes in the ground storey. At each side of the shop-front, entrances to the upper floors are arranged in pylon-like masses of stonework, pierced with windows of contrasting proportions of height to width. The fourth storey is treated as a deep frieze, while the horizontal value of the first storey gives the impression of a truss spanning the shop-front, satisfies the eye if not the intellect as to strength, and has the appearance of transmitting the load placed upon it by the two piers between the second and third floor windows to the pylons of masonry at the sides. The horizontal character of the first and fourth storeys is effected in a very simple way. The windows to all floors above the shop-front are all the same size, but those of the second and third floors are treated in iron, and produce together the impression of one long opening. In the first and fourth storeys the mullions are of stone, and by thus breaking up the width of the void the effect of a deep lintel is produced. The eye is further appeased by the employment of a curved marquise, the outline of which is in effect that of a wide segmental arch, and its projection serves to distract attention from the lines of masonry which do not run to the ground, but are changed to small iron columns below (p. 575). In the St. James office building in Broadway the late Bruce Price adopted a similar expedient to avoid the effect of masonry walls "standing upon three sheets of plate glass"; but the marquise is designed as part of the glass in the shop-fronts—in effect an opened glass umbrella to which a stout column below appears as a handle (p. 575). A further development of the deep-lintel idea is illustrated in the building belonging to the Brigham Estate in Boston, designed by Mr. Stephen Codman, though in this case the iron supports below have the appearance of being temporary.

The Window Problem.

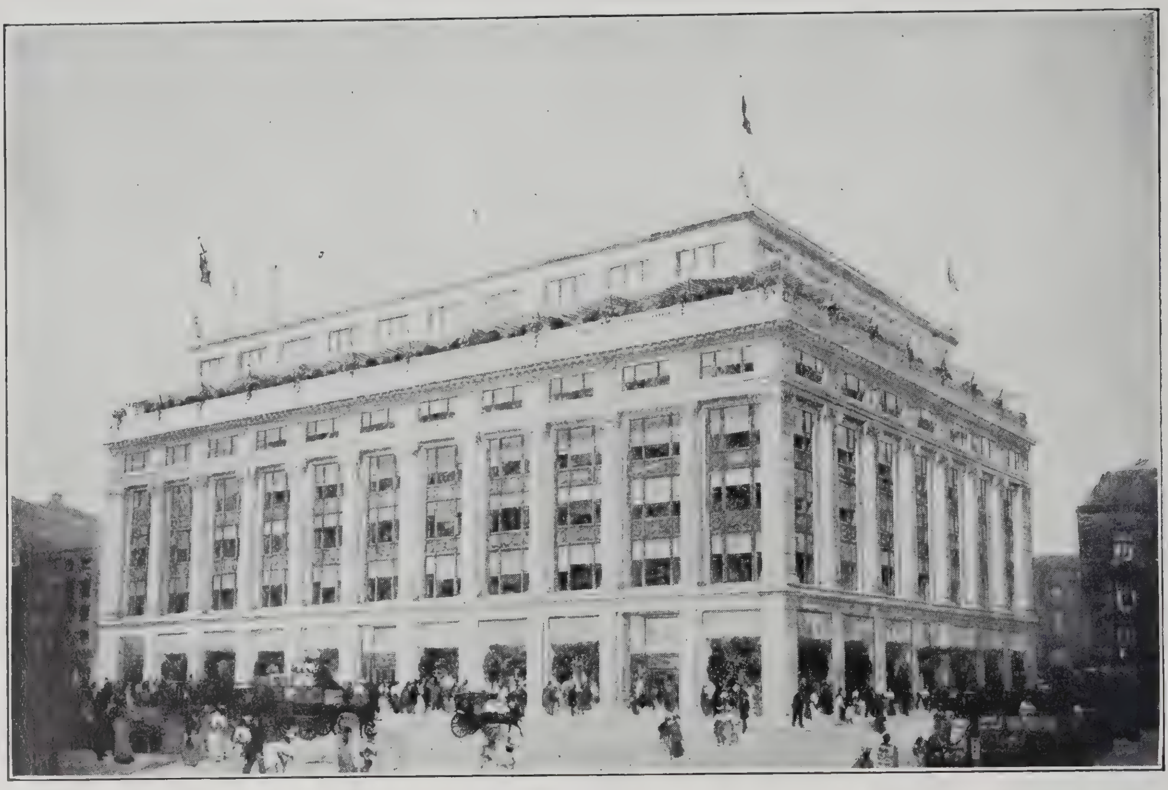
The demand for a great expanse of glass provides the real problem for the architect, and the modern methods of construction—the steel-cage and reinforced concrete—provide a simple practical solution. But the artistic treatment of such constructions is still in the process of evolution. Architects generally were for a long time reluctant to give up the effect of masonry construction, and upon the light lines of steelwork were built or hung by ridiculous little hooks thin slabs of terra-cotta, stone, granite, or marble arranged to represent arches, and courses of rusticated stonework that would put the fortifications of Sanmicheli to shame. Of rational designs in which the requirements of the occupant and the method of construction are both clearly expressed, an instance is illustrated by the Gage Building, Chicago, by Mr. Louis H. Sullivan (pp. 540-1). Here the lines of steel stanchions run from the ground to the top, and the girders are framed between them and clothed with dull glazed terra-cotta to protect the metal from fire and the elements, as required by the Chicago Building Act. Seven storeys used for exactly similar purposes are treated in an exactly similar manner. The greater width of the vertical lines at the sides is accounted for by the return or side walls; the wall above the top-storey windows marks the space required for pipes, and provides for the slope of the flat roof. The cornice does the double duty of protecting the façade from the elements and of providing a deep shadow which reduces the height of the horizontal band of terra-cotta, and emphasises the effect of a decorative "white" frame to the central mass of "grey." The shop-front is treated as something applied to the structure, as in fact it is constructionally. It is all glass in a cast-iron frame, and divided only by ornamental iron muntins. The thinness of the metal is redeemed by the character of the ornament, which is used for the purpose of stiffening and preventing buckling and getting "in winding" when taken from the moulds or cooling. The lace-like detail of this border and valance is immensely clever; the nice discrimination between the character of the two moulded materials (cast-iron and terra-cotta) and the different circumstances under which they go into the furnace is remarkably evident (pp. 540-1). One may at first sight wonder at the huge bunches of foliage at the top of the two lines of stanchions which, as decorative clasps to join the vertical and horizontal lines of the composition, are more conspicuous than necessary; but closer attention discloses that the foliage elaborates a large "mask." Mr. Sullivan is nothing if not an idealist as regards expression, and very possibly these masks were employed as a decorative symbol of the use of the wall on which they are employed; for this wall is itself a mask which hides such painfully utilitarian adjuncts to the modern buildings as pressure, storage, and expansion tanks, and the housing of lift machinery.

Varied Treatment of the Shop Front.

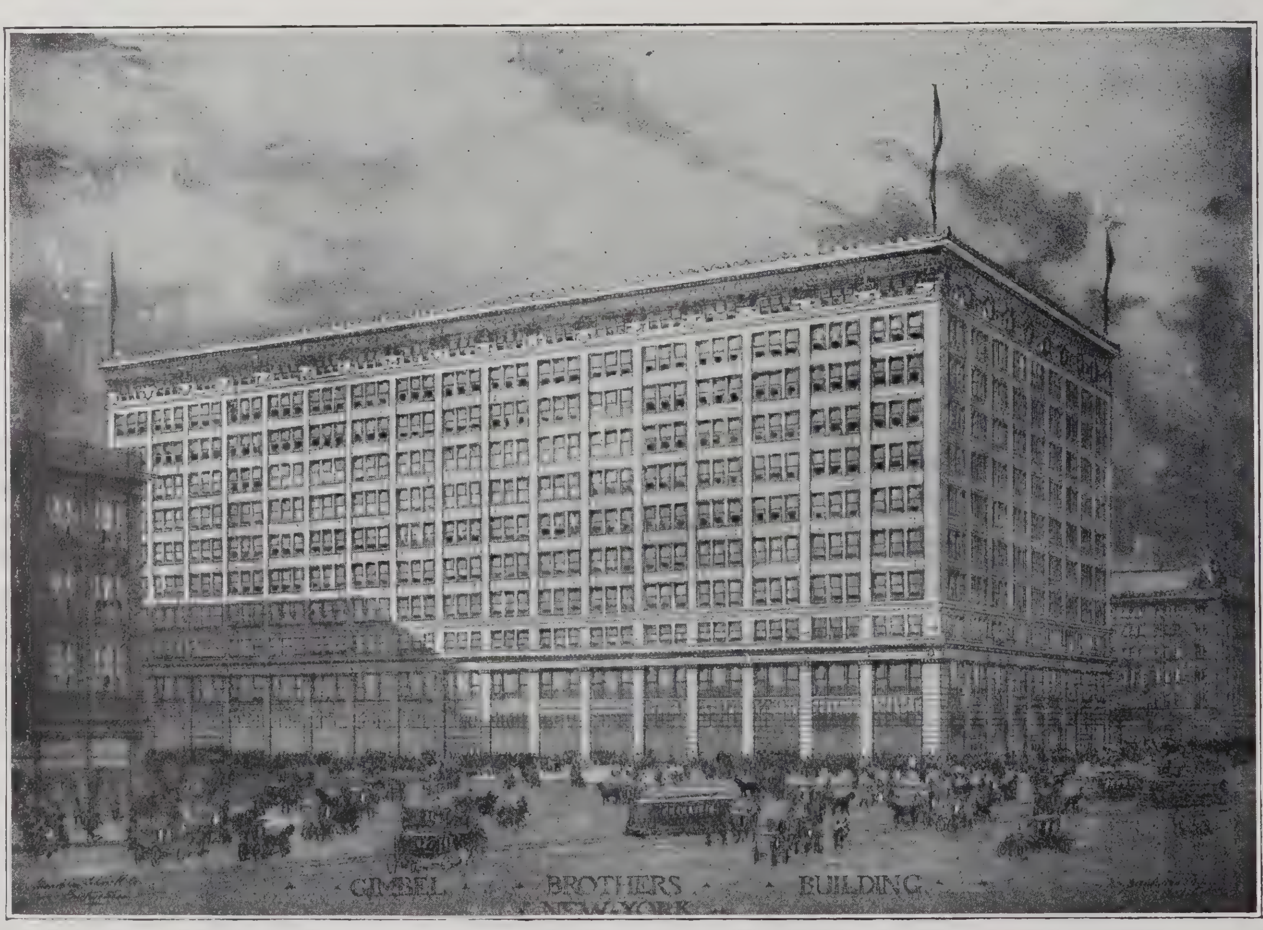
The shops in the Condict Building, New York (pp. 538-40), and the Guaranty Building, Buffalo, show another treatment of the shop-front by the same artist. Both are investment buildings, designed to be used for offices or for light manufactures as to the upper storeys, and for shops on the ground and first floors. The construction is even more apparent than in the Gage Building. The whole exterior of each is of ornamental terra-cotta, and the lines of stanchions run from the pavement level to the cornice. The continuous plate-glass shop-front is built outside the stanchions, or columns, in a metal framework which is so light as to be unnoticeable at a short distance (see p. 572). This looks like a practical compromise. It satisfies the merchant's demand for continuous plate-glass show-windows uninterrupted by structural piers, and enables the architect to maintain the apparent strength of his structure—that is to say, partially-



CABLE BUILDING, NEW YORK: DETAIL. McKIM, MEAD, AND WHITE, ARCHITECTS.



ORIGINAL DESIGN FOR THE SELFRIDGE STORE, LONDON. D. H. BURNHAM AND CO., ARCHITECTS.



GIMBEL BROTHERS' BUILDING, NEW YORK. D. H. BURNHAM AND CO., ARCHITECTS.

because as soon as the shop is occupied the columns are "decorated" by the shop's window-dresser, with disastrous results to the effect of the architectural lines, which appear from the opposite side of the street to be broken off a few feet above the ground line. These buildings are more than ten years old; but, as already indicated, the shop-front as desired for the so-called popular class of trade has yet to be evolved. No great improvement, however, is to be recorded in later works, beyond these designs by Mr. Sullivan, which are quite as good as we may expect—until, perhaps, he creates a new type.

Many of the better class or merchant shop-keepers take a keen interest in architecture, and know enough to have their buildings designed by the ablest architects. Frequently when it becomes a question of sacrificing either the aggressiveness of the shop-front or the appearance of the whole structure, he will defer wholly to the advice of his architect. That the architect has plenty of opportunity to indulge his fancy as to detail will be evident from some of the details of Mr. Sullivan's work (pp. 573-4). As to the more exclusive shops, the sites chosen are usually in such positions—most often on a corner—and of such dimensions that the last square foot of glass is not a leading consideration.

Novelty of effect is not desired; good permanent decorative (preferably Classic or Renaissance) architecture is wanted. Of this kind of shop, two of the newer buildings in New York may be taken as representative, the Tiffany Building (p. 572), which owes something to the Grimani Palace, Venice, and the Gorham Building (p. 573), which a prominent French architect, who recently visited the United States and commented upon the buildings of New York, pronounced as being "the handsomest commercial structure in the world."

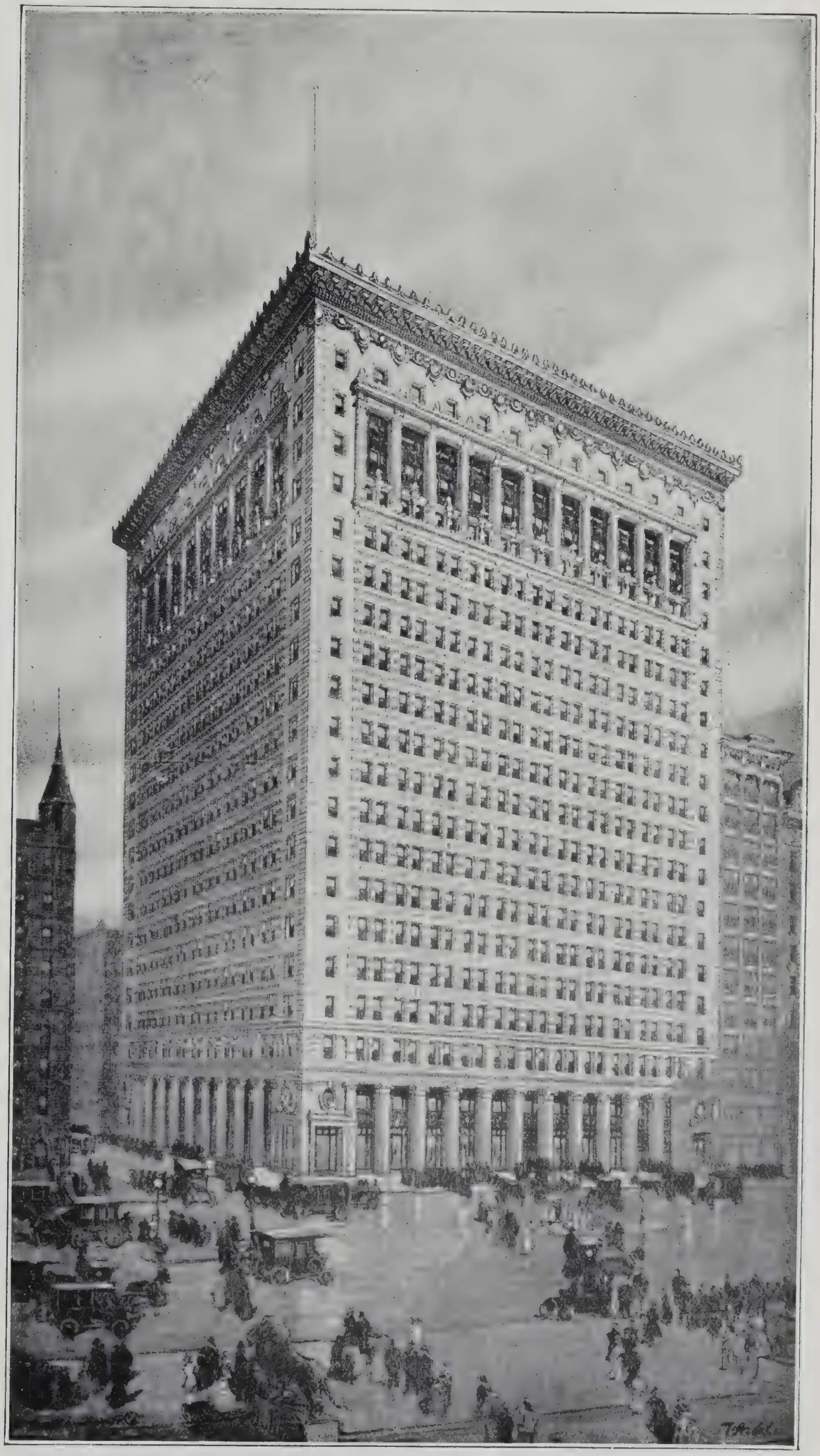
V.—Bank Buildings.

Early Banks.

The word *bank* is derived from the Italian *banco* (French *banc*), or bench, which the Lombardy money-changers used in the market-places. When one of these bankers could not meet his obligations, his bench was broken up by the public, and from this circumstance arises the name *bankrupt*. To the Bank of Amsterdam, founded in 1609, with its four burgomaster directors, who were changed annually, is attributed the credit of being the first modern banking institution, and the model upon which practically all European banks have been based. The Bank of England, to-day the strongest financial institution in the world—practically its clearing house—was the fourth national bank of importance to be founded in modern times. The first bank established in America was the Bank of North America, in Philadelphia, in 1782.

The Classic Revival.

When Soane designed the Bank of England, the so-called "Greek Revival" had begun in the architecture of England, and very great interest was being taken in the investigations and works of Stuart and Revett. It is doubtful whether he knew, or, if he knew, gave a thought to the fact that the Greek temples were the earliest type of building used for banking purposes—in fact, State banks. It is due to the same "revival"—at least the classic revival, which had taken place throughout Europe, and especially in France—that the earliest banks built in the United States were Classic in design, and with very few exceptions all banks throughout the country have been designed on Classic lines, and are Classic in spirit if not always Classic either in form or detail. In the United States there are three classes of banks: the National banks, which are organised under the national laws; the State banks, including commercial and savings banks and the trust companies organised under the laws of the various States; and the private banks, which in some States may be opened by anybody with sufficient credit and capital, and which are not subject to any regulations more than other private business enterprises. In the State of New York, excepting National banks, the title bank can be used only in connection with institutions duly conducted under the restrictions and provisions of the State laws. The American banking system, it will be seen,



PEOPLE'S GAS COMPANY BUILDING, CHICAGO. D. H. BURNHAM AND CO., ARCHITECTS.

ALTMAN AND CO.'S STORE, NEW YORK CITY: STAIRCASE AND LIFT ENTRANCE.
KIMBALL, THOMPSON, AND MACINTOSH, ARCHITECTS.

differs materially from the English or Canadian in that, while in the latter countries each bank is usually a very large institution with a head bank in London or Montreal, and with numerous branches all over the country, in the former practically every bank throughout the country is an independent institution, and each bank building is, consequently, the "head bank"; which fact alone accounts for the number of costly and monumental structures which have sprung up and are continuing to spring up in every State.

Early American Banks.

Among the earliest of notable American banks was the fine structure in Wall Street, New York (p. 552), for the City Bank, now the National City Bank, designed by Isaiah Rogers, used for many years as the Customs House, which held a respectable place as a work of architecture. This has quite recently been again converted into a bank, and materially altered and improved by the addition of a super-imposed order and magnificent banking rooms from designs by Messrs. McKim, Mead, and White (p. 555). This bank was organised by a special Act of the New York Legislature in 1812, with a capital of only £160,000. At that time there were only eighty-eight banks in the United States, while in 1908 there were 21,346 banks, with a combined capital which runs to an unconscionable number of millions of pounds sterling, of which ten millions is the capital of this institution alone. Formerly, with its great rotunda (p. 561) it was almost typical of the ideal modern plan, but it is now an unusual example owing to the fact that the banking rooms are arranged on more than one floor. This is probably due to the very high value of land in this part of New York—especially in Wall Street, where a site twenty-five feet by one hundred feet will bring as much as two hundred thousand pounds, or eighty pounds per square foot. Where possible, it is considered desirable to place the whole of the bank's staff upon one floor, or upon one floor and an open gallery, so that all may fall immediately under the eye of the manager.

The Larger Banks.

Some of the best examples of the large bank are to be found in the west or middle-west of the United States. Notable among such banks is the fine building of the Illinois Trust and Savings Bank (p. 554) which covers a large island site in the heart of Chicago. Messrs. D. H. Burnham and P. J. Weber are the architects. It indicates what a great impression must have been made upon the people of Chicago by the buildings of the Columbian Exposition of 1892-3, because it was not only one of the first Classical designs to be built of permanent materials in Chicago, but to the keen business-like minds of the directors of the bank it must have seemed like sacrificing on the altar of beauty the chance to obtain a large income. One may be sure they knew that it might easily have been made twenty storeys high, also that from such a building a very large revenue could be derived; but they chose to build beautifully rather than for profit. They got not only the beauty of the elevation, but with it one of the best practical bank plans in the world. The interior arrangement is well acknowledged externally; the plan consisting of a large square glass-covered court serving as the main banking-room, surrounded on three sides by a two-storey arcade and a row of departmental offices, which the arcade separates from the banking-room and to which it affords access. The fourth side is occupied by the public hall, which is screened off from the clerical room by a marble counter running the full width of the banking-room and surmounted by a bronze grille of simple and effective design. At each end of this public space are private rooms for the use of the bank's customers, and the offices of its president, manager and other officials. All the offices are lighted by large practical windows; in the ground storey provided with transoms, in the first storey with double-hung sashes only, but all made so that they can be easily opened; for it must be remembered that a variation of more than one hundred degrees Fahrenheit may be looked for between the hottest days of August and the coldest days of January or February in all the larger cities of the northern United States; that modern American heating and ventilation apparatus will maintain an even temperature as desired from sixty-five to seventy-two degrees indoors, while the thermometer outside registers several degrees below zero. But when summer comes, with ninety or more degrees in the shade, the water left on the dry and dusty brick or asphalt roads is converted into vapour, and at the level of the street there is hardly a movement to the air; not even the refrigerating apparatus of ammonia pipes and the powerful fans which discharge cold blasts into the banking-room can be counted upon to be very effective as regards the offices on the side of the building exposed to the sun's rays. Awnings, and a portable electric fan drawing from the main room and discharging out of the window, are helpful; but the open window—one that is as large as practicable for handling—is essential.

In the Illinois Trust and Savings Bank the windows express clearly the position of the offices, and a belt-course denotes the level of the first floor. The large Corinthian colonnade offers a spacious entrance portico, protects one side from the sun's rays, and its extent indicates at the same time the width and height of the main banking-room. The detail, like the composition of the building itself, is straightforward. There is not even that central point of interest in the form of a block or cartouche, so frequently present in designs of this character, to break the balustrade or blocking course, with the almost inevitable accompanying effect of weakening and causing an apparent sag in the horizontal lines of the entablature—a defect most apparent when the colonnade is a long one. Internally, as externally, the ornament is beautiful and appropriate; only in the capitals to the columns of the upper arcade and the plaster vaulting and treatment of the pilastered wall-surface under the same arcade do we find close adhesion to precedent without keen artistic discernment. Here there is some-

AMERICAN INSURANCE COMPANY BUILDING, NEWARK, N.J. CASS GILBERT, ARCHITECT.

thing mechanical, reminding one of the fidelity shown by Germans in their work in the Classic style, without the facility and happy grace so evident in similar examples by Frenchmen. This may be regarded as typical of the accepted character of the American bank building, Classic in style and expressive in purpose. The banking-room, usually from 35 to 60ft. high, and approximately a cube in its proportions, is acknowledged externally by the employment of the order (p. 549), or by the colossal arched window within the lines of which the entrance door is usually placed (p. 553).

Two Types of Bank Plan: Type the First.

There are two usual types of plan: First, that with the public space in the centre and the tellers' cages all round (p. 561, Type A.), and the working space arranged around these; or in separate wing, as in the Metropolitan Savings Bank, Baltimore, Md., by Messrs. Parker and Thomas (p. 553), and the Cleveland Trust Company's Building at Cleveland, Ohio, by Messrs. George B. Post and Sons (p. 561), which are the same type arranged to fit irregular sites and with the banking-room under a dome. This is usually the most effective type of plan, and is customarily arranged so that the officers' and directors' rooms are very accessible to the public—that is, towards the front—and not in direct connection with the working portion of the bank, the arrangement most frequent with the trust companies.

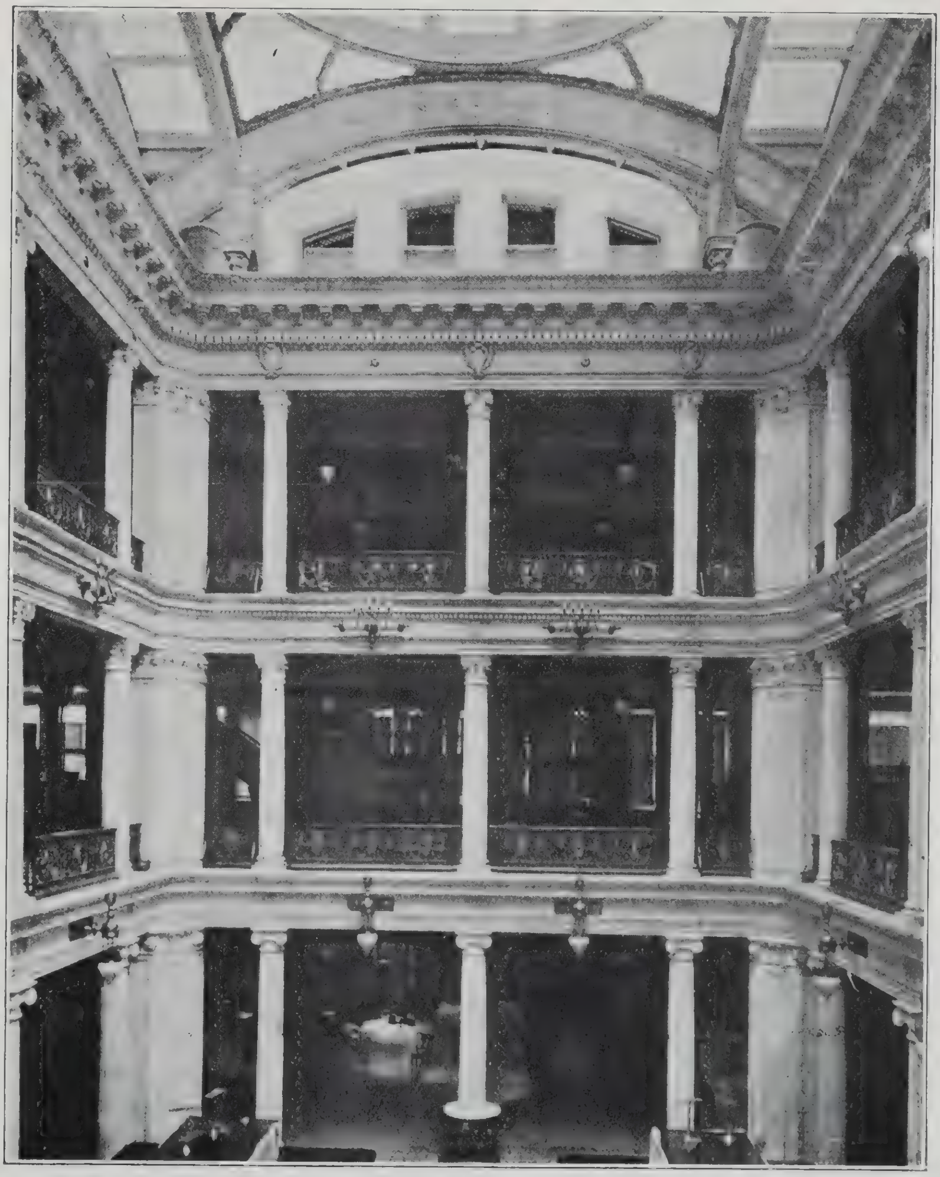
Type the Second.

The second type of bank (p. 562, type B) is that adopted where the clerks are accommodated in the central space, with the officers' rooms in direct communication with the directors' rooms and the waiting-rooms. With a comparatively narrow site, where the room can be easily spanned with girders or arches, the banking-room extends from front to back. In such banks there are no offices in front, and the vestibule is treated as part of the door, which is built in under the large arched opening (p. 553) that is often employed to express and illuminate the large hall. The Type A plan is most often employed when the site is wide and nearly square, when the offices are both the front and back, and sometimes also along the sides of the principal room. The order runs through two storeys, and the level of the first floor, or of the gallery, is indicated external by a belt course, or (as p. 554), by mouldings which sometimes form the impost to the arched heads of windows (p. 560), and are carried across the window openings in bronze.

An exceptional case, with the two-storey arrangement all round the central hall, and treated externally as a two-storey building, is illustrated by the huge building of the Girard Trust Company in Philadelphia (p. 560), which was designed by Messrs. McKim, Mead, and White. Here the full extent of the main hall is indicated only by a row of columns on each façade, under a pediment, and the dome (in this case 101ft. in diameter) rises behind. The interior (p. 561), shows the plan, which follows Type B. This is considered to be, both as to grandeur and fitness, almost the finest bank interior in existence.

Materials and Decoration.

Granite, marble, or limestone, or these materials in combination, are commonly used for the exteriors of banks, but the favourite material is marble. Exquisitely ornamented bronze, of the finest workmanship, is used for window frames and grilles, and for the lamps and other fittings. The entrance steps are nearly always of granite, with moulded nosings. "The masonry," says Mr. Swales, in a significant passage in one of his interesting articles in the "Architectural Review," "is finished in fine axed work; and entasis, flutings, mouldings, and carvings are often carried out in a way that shows that the master-workman must be more frequently found in America than here—and there can be no doubt that America has drawn severely upon Europe's supply of first-class workmen." The carving is used sparingly and bestowed judiciously; the architects supplying highly finished detail drawings, to which the sculptors work after submitting models for criticism. Inside, the floors are either of marble or marble mosaic, and are almost invariably designed by the architect. Much marble is used upon the walls. Sometimes the entire surface is covered with slabs (p. 548). Sometimes Keene's cement, polished, is substituted, and large decorative panels by the ablest artists are commissioned. In some instances the ceilings are as ornate as those of the great Italian palaces of the high Renaissance, but more often they are treated simply. The bronze counter-grille



ALTMAN AND CO.'S STORE, NEW YORK CITY: INTERIOR. KIMBALL, THOMPSON, AND MACINTOSH, ARCHITECTS.

is often designed and wrought with great skill. The grille in the Crocker Bank in San Francisco (p. 569) is a charming design in the style of the early Renaissance, influenced both by Italian and Spanish examples, yet wholly original, beautiful, and American. It is the work of the late Mr. A. Page Brown and Mr. Julius Schweinfurth, architects. Occasionally the grille may be subdued to a simple pattern, with a view to concentration of interest on some particularly fine feature, as a marble table (p. 566), or bronze clock, or wall painting, as in the State Savings Bank in Detroit, Michigan.

Essays in Originality.

The National Farmers' Bank at Owatonna, Minnesota (p. 590), by Mr. Louis H. Sullivan, is at once scholarly and original; and the design for "Security Bank" to be built of brick, stucco, and mosaic, is a daring conception of that singularly brilliant artist, the late Harvey Ellis (p. 559).

The Connecticut Savings Bank.

The Connecticut Savings Bank, New Haven (p. 590), of which Messrs. Gordon, Tracy, and Swartwout were the architects, is a good example of American Renaissance work. The fine flank, the contrast between the columnar portion and the strong and bastion-like ends, the projecting portico crowned with its pediment, impress by their expression of strength and power. The detail is after Greek models, but the effect has more of Roman sternness than of the suavity of the earlier work. This building is composed of the simplest elements, but the scholarship and feeling for proportion are evident. The interior view is very interesting, and shows a finely proportioned hall, with antæ running down the side, from whose entablature springs a fine vault. This is, unfortunately, cut off in the view, but it makes a most impressive bank interior.

Dime Savings Bank, Brooklyn.

The Dime Savings Bank of Brooklyn, (p. 558), of which Messrs. Mowbray and Uffinger were the architects, is on a site that seems to be a triangle, a shape to which we have lately become accustomed in this country. A corner entrance with axis bisecting the angle is the logical method of solving this problem. The views show how this has been done with quite a satisfactory result. The columnar effect is good, but somehow it leaves us cold and critical. The interior is much more satisfactory. It must be admitted that in this sort of spacious interior the American architects are fine designers.

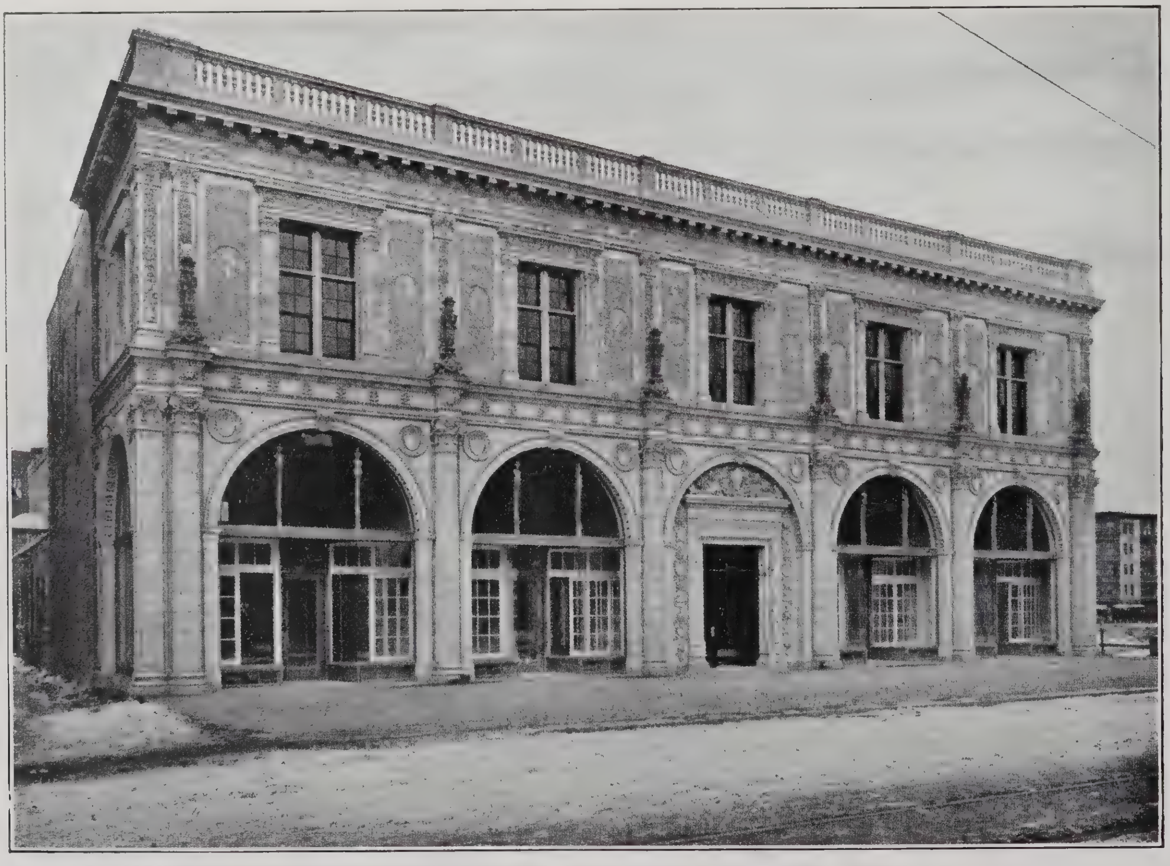
VI.—Public Buildings, Libraries, etc.

The Columbus Public Library.

If there is no tradition in America, there is no futile eclecticism to work clear of—no Gothic revival to retard the forward trend of thought in matters architectural; if they have no tradition of their own, they have chosen wisely in accepting that of France. French influence is strong, and the Beaux-Arts education is the model on which, as we have seen, the best American architecture is based.

The arrangement of the Columbus Public Library, Ohio (p. 590), of which the architect was Mr. Albert Randolph Ross, is an admirable example of axial planning. It is true that no difficulties of site having had to be considered, the problem was to a great extent simplified; yet in architecture the simple problem is not without difficulties arising from this very characteristic. One does not less admire a Greek temple because of the elementary requirements of its plan—it is the result as a whole that counts. In this case the conception of plan has gone with that of the façades to make what with but little danger of exaggeration may be regarded as a perfect building. No Renaissance building of its size can be more charming. The Petit Trianon has not more intrinsic merit as architecture. The impression these buildings give is one of a stately dignity and repose unmarred by any trifling—indeed, of the two, the American building makes its appeal more directly by reason of its chastened simplicity.

On each side of the spacious hall of the library are the main reading and the general reference rooms, with the stack-room directly at the back. Two staircases are situated on each side close to the entrance. A nicely proportioned cornice joining up the wings to the main block gives a sense of unity to the whole composition. The centre part of the front is advanced some 2ft. in front of the wings, and is ornamented with flat pilasters and three-quarter pillars in the Ionic style, taking a rich texture from this treatment, which is further enhanced by the plainness of the wings with their semi-circular-headed windows. A well-proportioned attic helps to give importance to the centre. The sculpture to the attic is admirably adjusted to its position. The details are vigorous, and nicely designed for their various positions; the moulding of the archivolt, for example, instead of running out against the glass, has a stone member expressly made to stop it. Both pillars and pilasters are reduced to the base as well as to the capital, as they are in a great deal of Venetian Renaissance and modern French work, with a very pleasant effect. The diminution to the base is very



CHICKERING HALL (PIANOFORTE SHOWROOMS), BOSTON, MASS, PEABODY AND STEARNS, ARCHITECTS.

slight: an excess in this matter leads to disastrous results. The view of the approach is of great beauty, and possesses all the qualities of fine architecture—dignity, unity, and quietness of effect, with an exquisite sense of scale.

Court House and Post Office, Indianapolis.

It would be difficult to point to a modern building in the architecture of which there is more vitality than is revealed in the United States Court House and Post Office, Indianapolis, Indiana (see p. 596). The tradition of the Renaissance seems to be alive and rejuvenescent. What could be more dignified, more imposing, than the range of great Ionic pillars carrying the weighty entablature and the delicate balustrade? What could be managed better than the strong end features to stop the colonnade, which, while strengthening the corners, also give the necessary importance to the entrances, emphasised still further by the flights of steps flanked by groups of statuary? The wide terrace with the heavy balustrading, ornamented with finely designed lamp-pillars, makes an admirable podium for the building. A fine air of distinction is the characteristic of this façade; there is no indiscreet trifling, no futile excrescence to destroy the unity of the main idea; everything is in harmony.

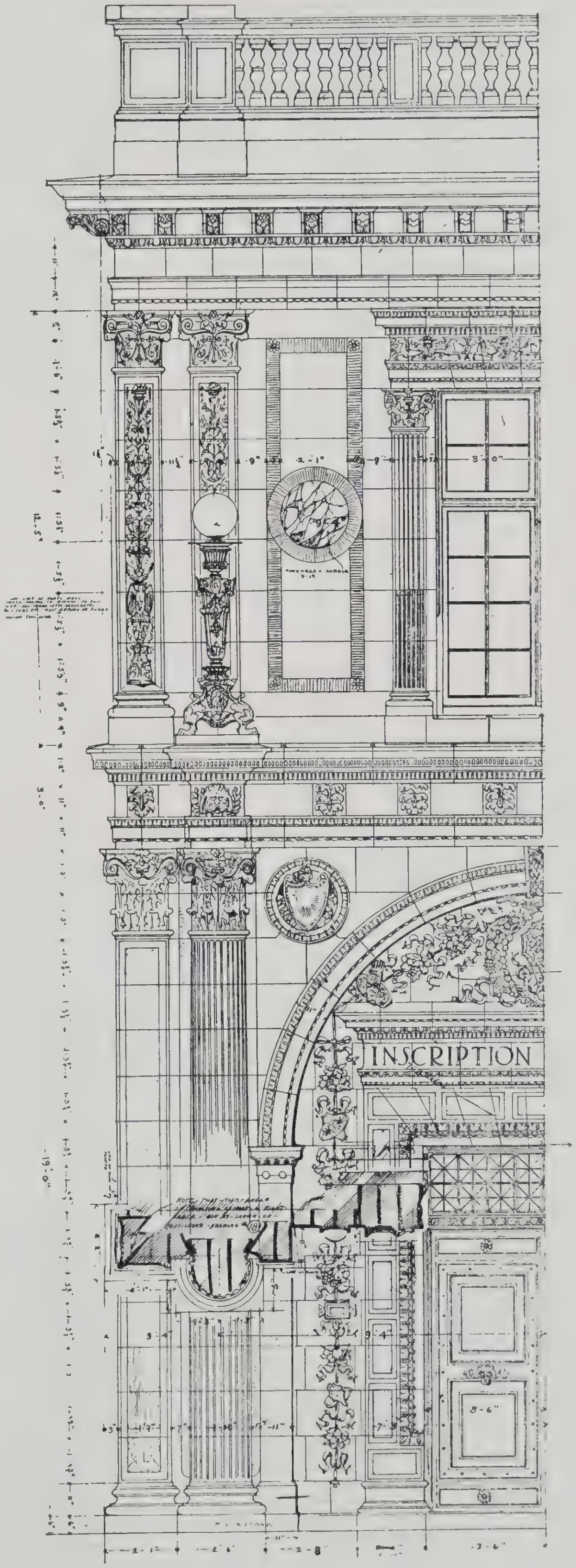
If the north front is less pleasing it is no less skilful in design. The sloping roadway for postal vans and heavy traffic is a useful device, allowing of this front being managed in an academic manner. Bold wings flank a recessed centre part, which is composed of a range of small Doric pillars with round-headed windows placed between. There is a contrast here, which is very pleasant, between the strong protecting wings and the low nestling building lying between. It should be noted in passing how well the corners are designed; instead of coupled pilasters, a heavy mass of masonry is used and capped after the manner of Greek antæ, very successfully. In the French and American Renaissance there is often a strong feeling for Greek detail, visible in the present example in the square-headed window of the main façade, the Greek capitals, but more particularly in its exquisite unity and simplicity. The plan is excellent; the carefully planned approaches, the domed octagonal spaces at their intersections, the long post office corridor, the great staircases, are all thought out in an architectural way. Of these the illustrations (p. 596), give an excellent idea—of the staircase with its winding wrought-iron baluster and handrail, of the marble-lined corridors with their vaults and decorations. Marble and mosaic are used lavishly, with fine precision of taste. To the full effect of mosaic, rounded surfaces are necessary, so that the vault and dome are ideal shapes for its application. Generally speaking, the pictorial panel is never successful, while the play of light and shade caught by rounded surfaces makes it a decoration of the greatest value. Another mark of sure judgment is the manner in which the angles of the vaults are treated, slightly rounded and without any hard bounding line or architectural moulding of stone or plaster. The architects are Messrs. Kellogg, Rankin, and Crane, of Philadelphia.

Public Baths.

The Bath interior from Phipps Natatorium, Pittsburg (p. 601), serves to show how different the American ideal is from ours in this class of work. Generally speaking, "baths and washhouses" are given over in this country to architects who have ideas of utility deeply seated in their souls, and who seldom dream of clothing the bare fact in anything but the thinnest veneer of thought. It is not to be denied that this interior shows a poor feeling for proportion—it errs much on the side of clumsiness, and the brick vault destroys instead of helping the scale; but in spite of defects it is much more architectural than the ugly skeleton to which we are accustomed. The detail of the gallery front is lacking in style, but the idea of the design is good; and the large window at the end is a great success. The Americans have a fine taste in lamps, and the spacious globes (a typical design) are excellent.

George Washington University.

The design for the group of buildings for the George Washington University—which was planned as part of the great monumental plan of the Capitol City of the United States—was selected in competition in 1905. It is a fine Classical composition of Messrs. Post and Sons (p. 589). The programme was an unusual one, being composed of two parts—one being for the



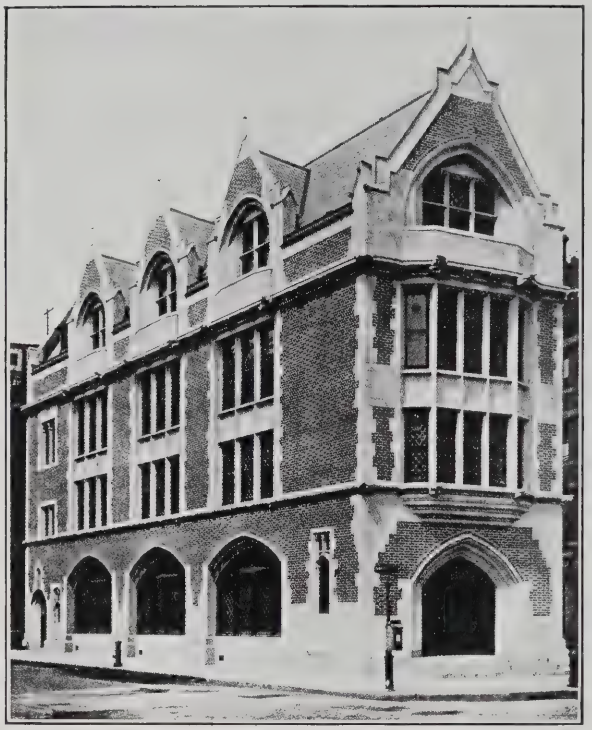
CHICKERING HALL, BOSTON, MASS: DETAIL OF FACADE.

University Buildings, and the other for a Memorial Building to be erected by the George Washington Memorial Association as a memorial to George Washington. Messrs. Post's plan for George Washington University constituted one of the ablest studies which have been made for the details of the city plan of Washington.

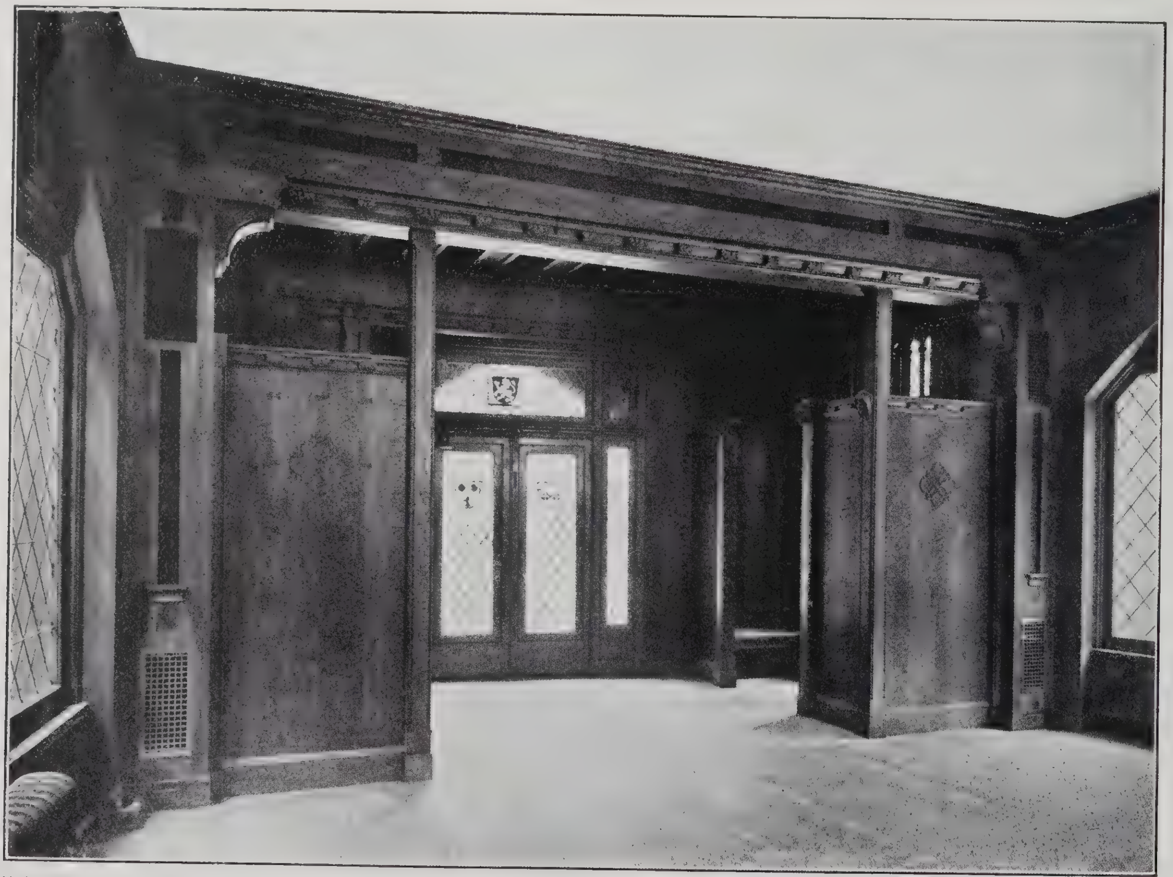
Another fine piece of city planning is that by Geo. Post for the suggested improvements of the harbour of Newport, Rhode Island (p. 603).

Wisconsin Capitol.

The Wisconsin Capitol building (p. 598) is a public monument of first importance, and as a work of American architecture will rank the greatest among the many works thus far produced, with which the name of Post will be for ever associated. The site upon which this Capitol is located is one of singular beauty. A square park, situated between two lakes and on the crest of an elevation of land, from the centre of which all of the principal avenues of the city of Madison radiate, both on the direct and diagonal lines, together with the original instructions of the Commission to the competing architects that the building should be cruciform in plan, led to the creation of a design which is radically different from any other existing State Capitol. It possesses singular points of interest both practically and artistically; practically in the fact that the various departments of the government which occupy the building are brought into the closest possible communication with each other, and at the same time are in separate wings of the building, and artistically in the fact that the great central architectural feature of the building, the dome, which rises to the height of about 200ft. above the four wings to the top of the crowning figure representing "Wisconsin," will be approached directly through monumental entrance pavilions constructed on the reentering angles of the building; and added to this the fact that the whole building to the top of the cupola is of white Vermont granite. On the line of the direct avenues dignified grand staircases lead up to the first floor level of the entrance pavilions. These serve, too, as shelters for the carriage entrances to the ground floor of the building, which may also be entered on the ground floor under the porticos at the end of each wing. The four wings placed on the diagonal lines of the Park on the extension of the four avenues, terminate in

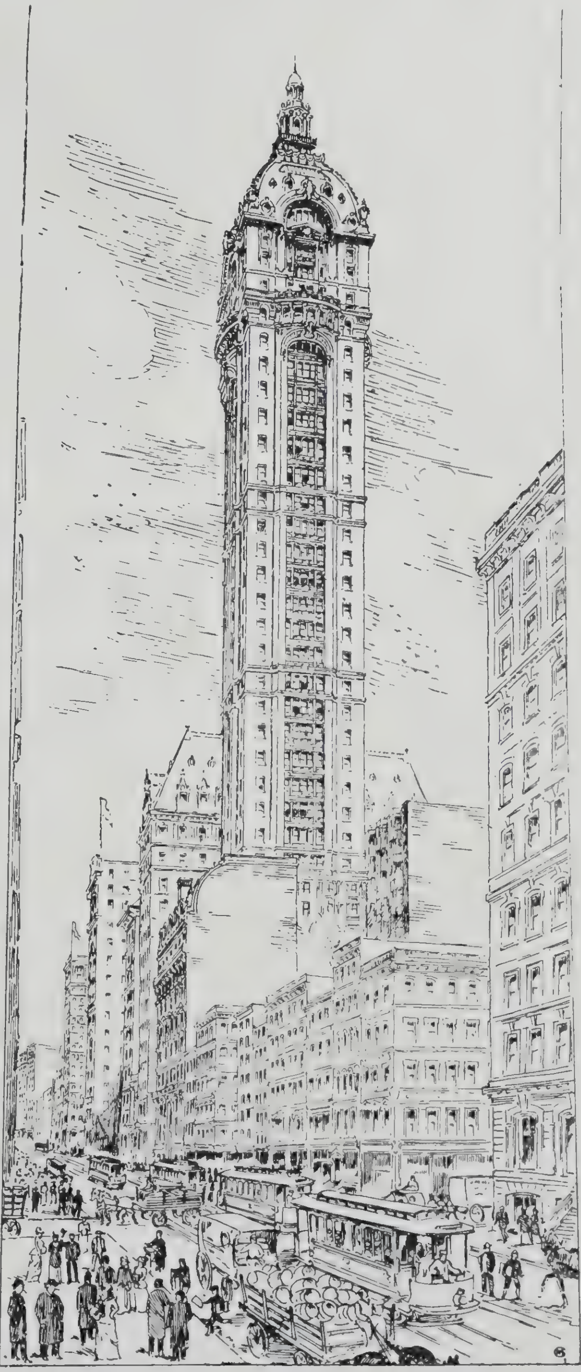


BUSH TERMINAL COMPANY OFFICES, BROAD AND PEARL STREETS. NEW YORK CITY. KIRBY, PETIT, AND GREEN, ARCHITECTS.

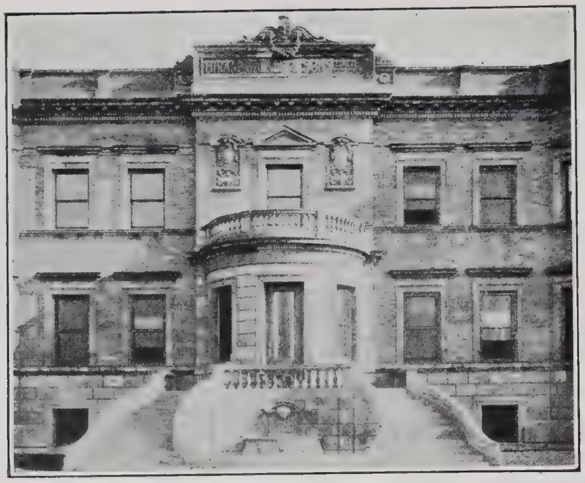


BUSH TERMINAL COMPANY, BROAD AND PEARL STREETS, NEW YORK CITY: LOBBY OFFICES KIRBY, PETIT, AND GREEN, ARCHITECTS.

dignified porticos composed of six Corinthian columns supporting pediments, in the tympanums of which are groups of statuary by Karl Bitter, that of the west wing representing "The Unveiling of the Resources of the State," and that of the east wing representing "Liberty Supported by Law." The proportion of the building from all directions is enhanced by groups of statuary at the base of the dome overlooking the corner pavilions, which not only add materially to the interest of the design, but to the pyramidal effect of the entire composition. Advantage has been taken of the opportunity afforded to make a thoroughly unique design for the interior, and by the disposition of the grand staircases unobstructed vistas about 200ft. long have been left from the principal rooms in each wing. On the ground floor uninterrupted vistas extend the whole length of the building, more than 400ft. The interior diameter of the dome is approximately 75ft., and its height from the ground floor level to the eye about 200ft. Galleries encircle the rotunda. Those on the second floor level are supported by Waupaca red granite piers, which in turn are supported on the ground floor by Wisconsin green granite piers. The piers which flank the grand staircase are similar and are erected with each wing. The gallery railings are similar to those of the staircase and stair galleries of each wing. The wall lining of the central portion of the building and staircase halls of each wing is of beautiful soft-toned Kasota stone. This is up to the main cornice line, above which it will be plaster. The same stone is also used for the wall lining in the main corridors of the first and second floors of the wings, the wall base being of Hauteville marble. On the ground floor corridor stone is used, the skirting and columns being of marble. The staircase rails and balusters are of dark red Tennessee. The treads and risers are of Meadow Grey Tennessee. The main pilasters of the staircase halls are of Pike River red granite, and the columns flanking the entrance doors to the lobbies of the principal departments at the end of the staircase halls are of red granite. In the interior design Wisconsin stones, or stones from the immediate neighbourhood of the State, have been used wherever practicable, and the architectural effect has been gained rather by elegance of proportion and careful selection of colour than by great elaboration of ornamentation or detail. Where enrichments are used, they are concentrated at the points where they will give the greatest effect, and the best talent has been employed to prepare the necessary sculptural models. In designing the three great rooms of the Capitol—the Assembly Chamber and the rooms of the Supreme Court—the architects have avoided the use, in spite of their architectural beauty, of heavy vaulted ceilings or domical forms, in order to secure as far as possible a good acoustic quality, bearing in mind the fact that the speaker will have to address the audience from any part of each one of the rooms. The form of the Assembly Chamber (A) in the west wing is approximately 73ft. by 68ft. by 41ft. high, lighted through a large circular ceiling light of low-toned leaded glass. The square form of the room is brought into the round form of this opening by very flat elliptical pendentives. The space under the elliptical arch on the north side of the chamber is occupied by the Speaker's platform, behind which the wall is wainscoted to the gallery level. The space above is occupied by the magnificent mural painting by the distinguished artist Edwin Hoyland Blashfield. It represents "The State of Wisconsin: Its Past, Present, and Future." The space under each of the remaining three elliptical arches is occupied by galleries supported by Breche Violette Italian marble columns, which separate the main auditorium from the entrance lobby and corridors, and in turn give direct access to the loggia on the west front, and the Assembly Parlour on the south side of the wing. The walls of the Assembly Chamber are of the spring of the arches, above which the walls and ceiling are of plaster, decorated with appropriate low tones to harmonize with the marble and Mr. Blashfield's painting. The room is approached through a lobby, the walls of which are lined with Botticino Italian marble, with matched panels in the central portion of Light Sienna marble. The whole length of the lobby is brought into correct proportion by the introduction of columns of Royal Tennessee marble. The central portion of the lobby opens into the main stair hall through three rich electro-plated cast-iron grilles. The Assembly Reception Room is finished in Circassian walnut panelling, with mantels at the ends of Sienna marble, and floor of marble tile. The floor tiling for the halls, corridors, and ante-rooms throughout is in carefully studied mosaic of limestones and coloured marbles in large slabs, and the electric light fixtures and ironmongery throughout have been specially designed as part of the architectural enrichment of the building. The east wing contains on the second floor the Supreme Court Room (B), and a suite of offices for the judges, and on the first floor the Executive Chamber and Attorney-General's Department. On the third floor is situated the library, connected by elevators and stairs with the corridor surrounding the Supreme Court Room, communicating with the judges' offices and also by elevator with the Attorney-General's Department on the first floor. A reading room is also provided for the general public, in connection with the



SINGER BUILDING ADDITION, BROADWAY AND LIBERTY STREETS, NEW YORK CITY. ERNEST FLAGG, ARCHITECT.



OFFICE BUILDING, WALKERVILLE, ONTARIO. GEO. D. MASON AND ALBERT KAHN, ARCHITECTS, OF DETROIT.

library. A room 46ft. by 40ft. is provided in the attic, the rest of the attic being given up to storage purposes. The Supreme Court Room is square in plan, its dimensions being 42ft. by 42ft. by 30ft. high. It is lighted by a large central ceiling light of low-toned leaded glass work, set in a flat coffered ceiling—this to prevent reverberation. The court room itself will be finished in two shades of Botticino Italian marble, the pilasters being of fine Italian Coralline marble, with small columns of Sienna behind the judges' platform. Other marbles of decorative colour are to be introduced where they will produce architectural effect. Space is provided for decorating this room with four mural paintings. The Executive Chamber, with its lobby, is most carefully studied to secure the greatest amount of dignity and decorative effect. The design for this room is in the Venetian Renaissance style, and it is arranged to introduce in the wall panels three historic mural paintings representing prominent events in the early history of the State. The building is designed to stand on a terrace or platform, and thus equalise the differences in the level of the park, and give the building a greater appearance of symmetry.

College of the City of New York.

The group of buildings for the College of the City of New York, of which George B. Post is the architect, is built on a most admirable site, bounded on the east and north by the curving line of St. Nicholas Terrace, from which the hill goes steeply down to Harlem Flats. To the west and south the ground is level, or even rises a little from the College site, and the entrance front, with its triple gateway, is seen by persons approaching it along what is practically a common city street without much rise or fall. On the other hand, the perspective view with the tower (p. 595) is practically what is seen by the person approaching the building by climbing the steep hillside which will, of necessity, always be used as a park, the view which is seen by anyone a mile away on what used to be called Harlem Flats. If, in other words, one were to stand on top of a house at 150th Street and Sixth Avenue, the point which we take to be practically coincident with the edge of the Harlem River at that point, he would see the college in this way, or nearly in this way. The Tudor Gothic or "Collegiate Gothic" style of this work suited itself well to Mr. Post's idiosyncrasies as a designer. It appears that the persons charged with the responsibility of selecting a design after what proved to be a very thorough and fair competition, found themselves led to the conviction that this style, associated with memories of Oxford and Cambridge, was what they desired to see used for the new building. A more fresh and less "decadent" one would have pleased many of us much better, but it has been interesting to see what this essentially picturesque designer has made of this rather conventional style. The plan is worked out with closest regard to common-sense and the requirements of the situation, and the exterior design has been developed naturally from that well-studied plan.

Since its completion, much has been published in regard to this group of fine buildings, and much harsh criticism has been hurled against it, particularly as regards the colour scheme. Due allowance has not been made by the critics for the weathering properties of the materials used, and the ultimate effect when partly covered with vines and relieved by the trees and shrubbery now being added.

The True View of American Architecture.

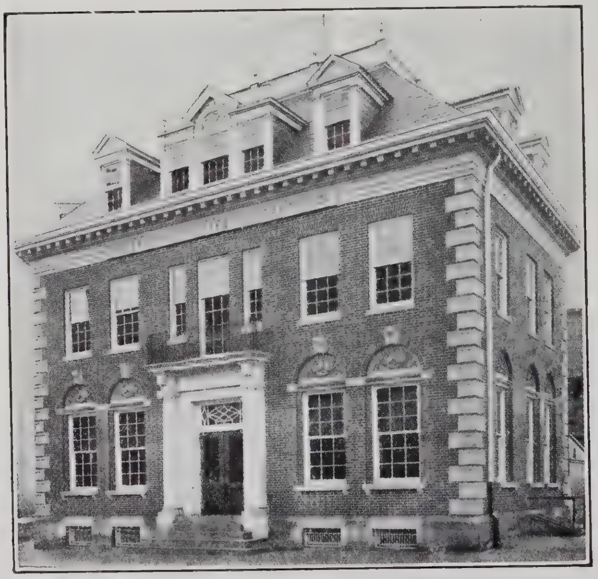
The large section of this special issue which we have felt justified in devoting to Modern American Architecture is its own apologia. In arranging for the series of articles which it embodies, it occurred to us that possibly we might encounter a certain amount of insular prejudice. For the average home-abiding Briton, American architecture meant monstrous skyscrapers; and, not greatly to our astonishment, we have met a few architects whose information on the subject was not much nearer the truth. These few we hope to have converted to the larger views of certain British architects—men of eminent reputation—who have expressed the warmest approval of our project, saying, in effect, "The Americans are doing some exceedingly fine work, and you are rendering British architects an invaluable service in placing before them such excellent examples of it." Such is the tenour of many communications that have reached us; and we must confess that we are delighted to have been able to do so much to correct the too prevalent insular view, and to have had the honour of exhibiting for the first time in this country a representative selection of the best work of the leading American architects.

International Exchange.

Between the two countries there can be no real rivalry; but there may be—and we sincerely trust that there will be—much wholesome emulation, which is an entirely different matter. The Americans are not too proud to acknowledge that they have learnt much and have still much to learn from Europe. The extent to which they are indebted to France in particular is plainly evident in many of the examples here illustrated. And we in England are at length recognising more clearly—or at all events more fully and frankly—than ever before, that, art being cosmopolitan, a free international exchange of ideas and experience is essential to progress. It is in that spirit that these examples of Modern American Architecture are here presented, and it is in that spirit that they will doubtless be warmly welcomed.

America's Larger Opportunities.

There are some respects in which British architects will hardly be able to avoid envying their American confrères. There can be but little doubt which country affords the larger opportunities. The wealthy American differs from the rich Briton in two respects that have a most important bearing on art and architecture. The former spends boldly; the latter timidly. The former, having offered a good price to a good man, is not so foolish as to interfere with him, but gives him a free hand—"trusts the man who knows"; whereas the Briton is peculiarly



METROPOLITAN LIFE INSURANCE BUILDING, BALTIMORE, MD. N. LE BRUN AND SONS ARCHITECTS.

THE CUSTOMS HOUSE, NEW YORK CITY. CASS GILBERT, ARCHITECT.

apt to be disastrously meddlesome, so that whilst an American building expresses the idea of the architect, the British building is too often a weak compromise between architect and client.

The Growth of Taste.

That in America the growth of taste seems to flourish on more congenial soil is further shown in the present high estimation in which art and art-craftsmanship are held in the States. "At no period of this country's development," says a recent writer in an American architectural contemporary, "has the artist-craftsman been held in so high regard by the public as now." It is further noted by the same writer: "Perhaps the most impressive evidence that can be adduced to prove the advance in matters of art in this country is to be found in the civic beauty movement now gaining strength from Maine to California. It would manifestly be impossible to attain the splendid results that have been secured in scores of cities if the public were apathetic, or unappreciative, of the immense value accruing from an intelligent handling of the city-planning problem. While realisation of the fact that commercial value is directly proportional to artistic merit was not general a decade ago, little argument is required to-day to convince the average municipality of the advantages, from every point of view, of adopting a comprehensive scheme for betterment and future development. Obviously an appreciation of civic art is not the first stage in the artistic development of a people, and its presence speaks volumes for the advance in matters of art of the masses in America."

The American Spirit.

We cannot, it is pointed out, have good architecture in any country until the general public acquire an understanding of and an appreciation for what is best in the work given them by the profession. As an instance of a rather different spirit from that which is too commonly encountered in our own country where decision has to be made between art and expenditure, it is related that in the case of the Bureau of American Republics in Washington, some of the sculptural adornments proved, when nearing completion, to be below the standard that the architects and the Government were desirous should prevail in this building, which is intended for the exercise of the country's hospitality to her sister Republics on the American continent. In this dilemma, Mr. Root, anxious to obtain the very best results, did not hesitate to abandon existing models and the work that was already well advanced, and to authorise the additional expenditure necessary for the substitution of more worthy work. Mr. Root, who, it is admitted, has shown rare enlightenment and artistic feeling, even for an American public man, is quoted as saying, "An architect who does not change and improve his design as it is being executed, and who does not ask for extras when necessary, must be dead." In Britain he is more apt to be dead from heartbreak, as the result of the cruel and barbaric parsimony of the authorities, who ruthlessly thwart him at every turn and ruin his design, because the only art they know or esteem is that of cutting down expenses, which, as someone has said, they have "reduced to a fine art." Yet even in America the niggardly client is still too much in evidence; otherwise there would have been no necessity for the following significant comment on Mr. Root's action: "It is unfortunate for the general public, as well as for the progress of the profession and the advancement of the art of architecture, that this breadth of view-point belongs only to an individual representing the still infrequent pioneer in artistic development. When the greater proportion of American clients have attained an equal amount of enlightenment, our [American] architecture will have adopted a much higher standard than is possible at present. In working under such appreciative conditions the individual designer is perforce put to his best endeavours, and, in case the result is not every way unimpeachably satisfactory, he cannot then blame any part of his failure upon his client!" The British architect would willingly abandon the suggested form of consolation or ground of excuse in exchange for the larger scope that, on the whole, his American cousins undoubtedly enjoy.

Open-Air Sculpture.

The growing feeling for art was manifested in a very striking way last year, by the holding, in Chicago, of an exhibition that was as remarkable in its inception as in its results. Under the auspices of the Municipal Art League—a title that excites our admiration and envy—and with the assistance of the West Chicago Park Commissioners, there was held an open-air exhibition of American sculpture. The object was to educate the public as to the proper use of sculpture in American parks, where, as in our own public places, the distribution of sculpture is usually inappropriate. "Certainly," observes a writer in the American "Architectural Review," "a war hero in fighting position is not the kind of sculpture to place in a pastoral meadow, or to burst upon in a woodland path where soul and heart have finally found rest, and proclaimed peace and goodwill to all men. Neither does the usual portrait monument placed directly in the centre of the park drive add to the effect of the landscape. On wandering along the rippling brook into a dark and shadowy cove, where every nook teems with the mysticism of the forest, here certainly is not the place for the commemoration of heroic deeds. Or in a mirroring lake, where reflections suggesting mystic depths are cast from woodland groves—not here the bearded figure ot Neptune! No; but where park and city meet—where the city extends into the park, and the park into the city, 'the clasping hand'—there we may find a place for plastic forms. Or where formal lines dominate the landscape, and precision in line is the rule—there is the natural place for an appropriate group."

It was upon such principles that the exhibition of sculpture in the Humboldt Park, Chicago, was arranged. Part of the gardens is formal, and part naturalistic, thus permitting of considerable variety in the setting of the sculpture Crunelle's fountain and Miss Walker's "Grief" were greatly emphasized by their surroundings. The bulls of French and Potter stood out well in silhouette against the red light of the western sky as day turned into night; and the forms above the garden terrace, well backed by a growth of woodland plantation, assured one of outline, and

DOME OF THE RHODE ISLAND STATE HOUSE. McKIM. MEAD, AND WHITE, ARCHITECTS.

added distinction to the gardens. The exhibition is here mentioned less for its intrinsic interest than for the light it sheds on the American view. Such an exhibition would be almost impossible in Great Britain, because we lack the enterprise, if not the parks and the art. In this matter, as in that of architecture—which, by the way, we observe that the Americans call not the "Mistress," but the "Master" Art—it is apparent that the transatlantic spirit is more audacious than our own, daring to put into action the ideas that we are content to express as pious opinions, or, indeed, that we are almost afraid to express at all, for fear of exciting the ridicule which in this country is not exclusively reserved for legitimate objects.

Architectural Gardening.

As may be inferred from the mere possibility of holding such an exhibition as that at Humboldt Park, the Americans are devoting a great deal of attention to what may be termed architectural gardening. Indeed, the interest in the subject is sufficient to support at least two periodicals that are specially devoted to it—"House and Garden," and "American Homes and Gardens," both published in New York City, the former in its sixteenth, the latter in its sixth volume. In these periodicals it is noticeable that the profession of "landscape architect" seems to be thoroughly accepted and familiar, and the success of such journals, which appeal to the wealthy laity rather than to the architect, may be regarded as a rather striking proof of the interest that the American takes in the home and its surroundings. Also, as in England, there are many periodicals of general character that give more than a side-glance at the architecture, furniture, and decoration of the home; and it has been lately a subject of serious complaint in the architectural journals that in a certain American periodical for ladies the cost of building and furnishing the sumptuous and elaborate houses illustrated has been grossly and systematically understated, to the detriment of architects. It is to be supposed that the ladies treat the pretty pictures of houses as if they were fashion-plates, and go to the architect and say, "Build me a house like this, at the cost mentioned under the picture," and when the architect is forced to say that the actual cost will be three times as much as that stated, the client sets him down as an extortionate fraud.

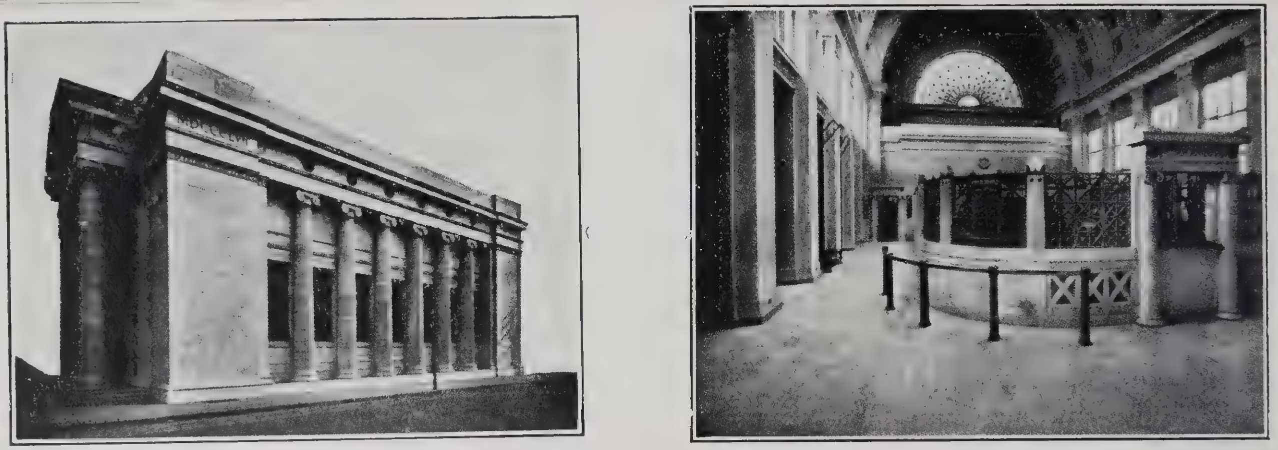
An Architect's New York Home.

Even in the United States an architect here and there may find time to design his own home. The residence of Mr. Bertram G. Goodhue, of the firm of Cram, Goodhue, and Ferguson, is stamped with his own individuality, although it only represents the adaptation of an existing building. It is a three-storey brick building with stone dressings, the narrow frontage being further redeemed from insipidity by the projection of two rectangular bays over a wide stone doorway.

The dwelling of an architect, as an American contemporary remarks in describing the house, is always more or less to be taken as expressive of the man's individuality or personal leanings. Oftentimes, it is true, such a dwelling may express—more than anything else—a rebound from the ordinary every-day "job" of building what other people want—even to the extent of misusing the structure to exhibit a number of "freak" ideas! This was more likely to be the case some years ago than to-day, when architecture in America has reached more of a normal plane, and its practitioners—more skilled in restraint—also realise that, if anywhere, the taste that is within their scope should be in evidence in the one building where they cannot shelter themselves behind the oft-repeated excuse, "My clients insisted upon this"—or that "eccentricity of design!" Any great individuality in plan or arrangement is almost impossible in a New York dwelling. The variations allowed within the restricted area of the small city lot are so slight that, to obtain those necessary requirements of light and air, without restricting or intruding upon one's neighbours, a "type plan" is literally forced upon the architect.

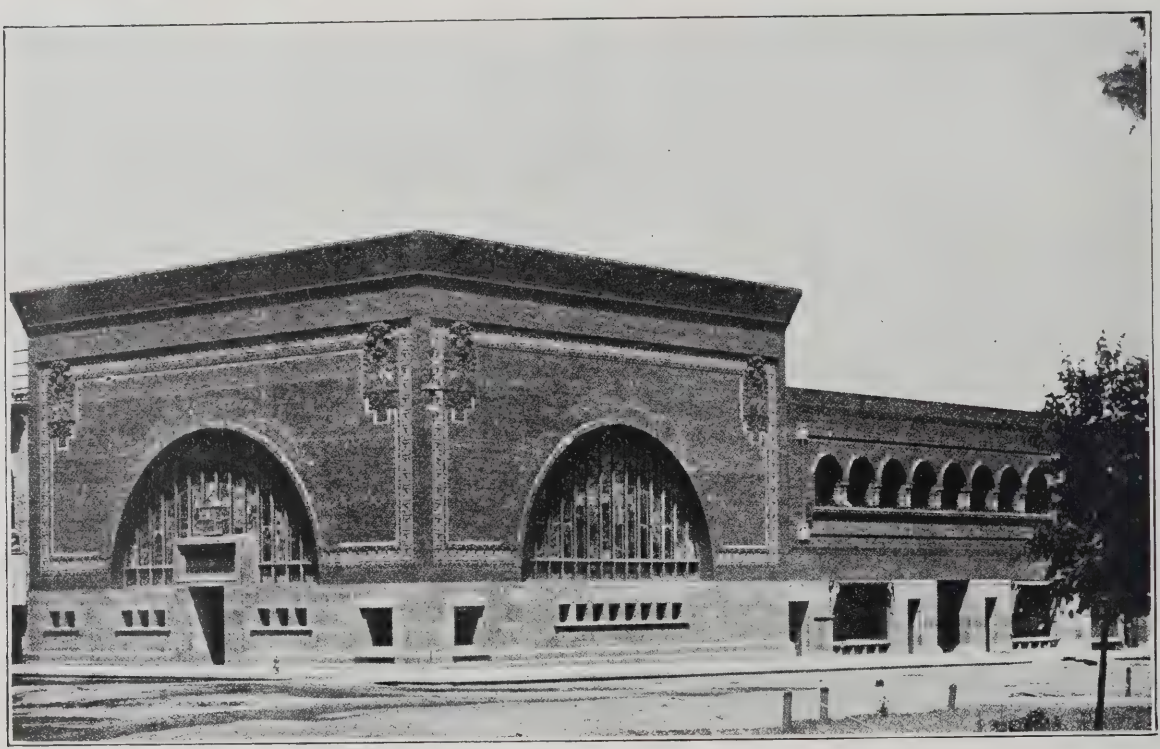
In the case of Mr. Goodhue's house, the plan was even more definitely determined, inasmuch as the building is an alteration of an existing house, where the new owner's ideas are only to be expressed on the front façade; on such important interior, elements as stairways and mantels; and what else may largely be classed among the "decorative portions" of the structure. These limitations once understood, the real individuality of the dwelling is better realised. Certainly, the owner has practised what most architects preach, in striking this note immediately upon entering the front door. The hall is, in itself, one of the simplest, yet most novel portions of the dwelling. The floor, of old yellowish-stained marble, with little square bluish-white "Persepolis" tiles at their corner intersections, and one entire wall a warm and vibrant mosaic of Mercer tile, strike at once the dominating tone of the dwelling. The stairway and hall are perhaps in design the most "modern" part of the building. A suspicion of "L'Art Nouveau" is to be discerned in the tapering column-shafts and their simple decorative touches of inlay

GEORGE WASHINGTON MEMORIAL BUILDINGS, WASHINGTON, D.C. GEO. B. POST AND SONS, ARCHITECTS.

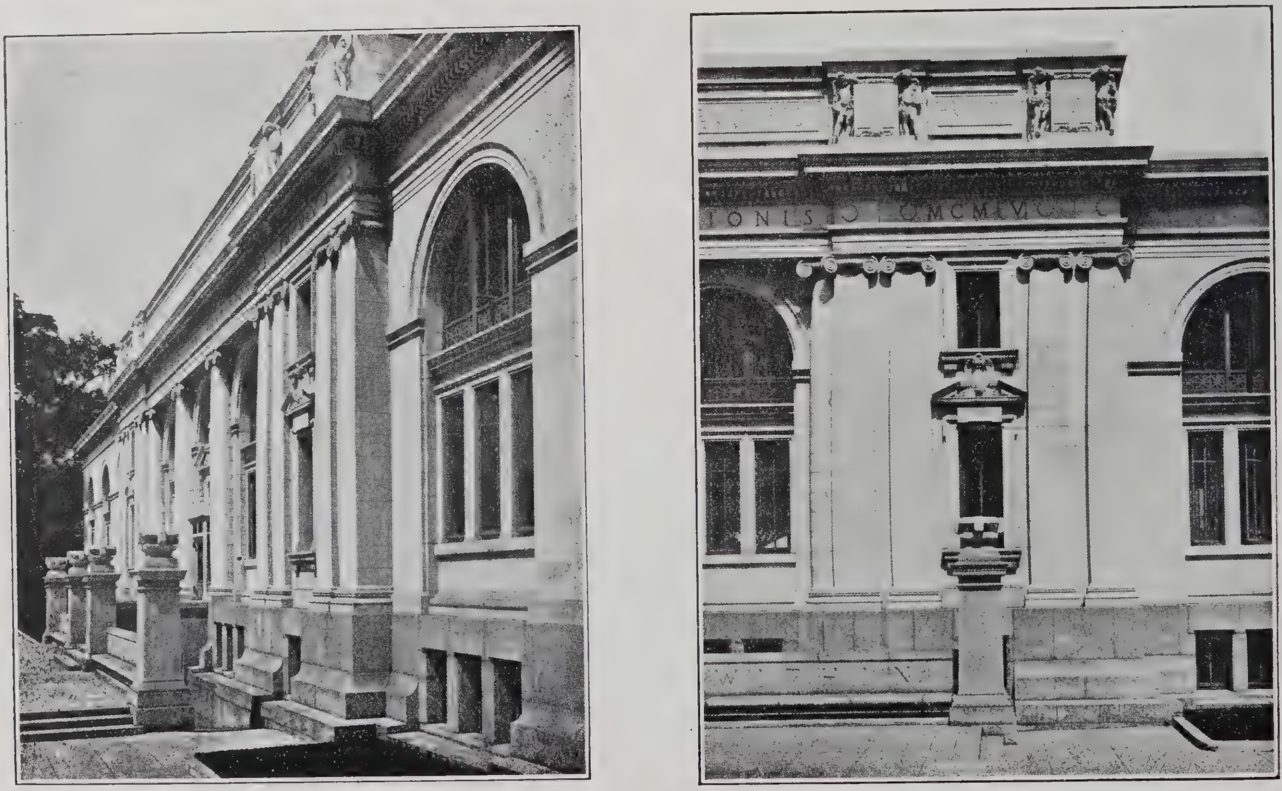


Perspective View. Interior.

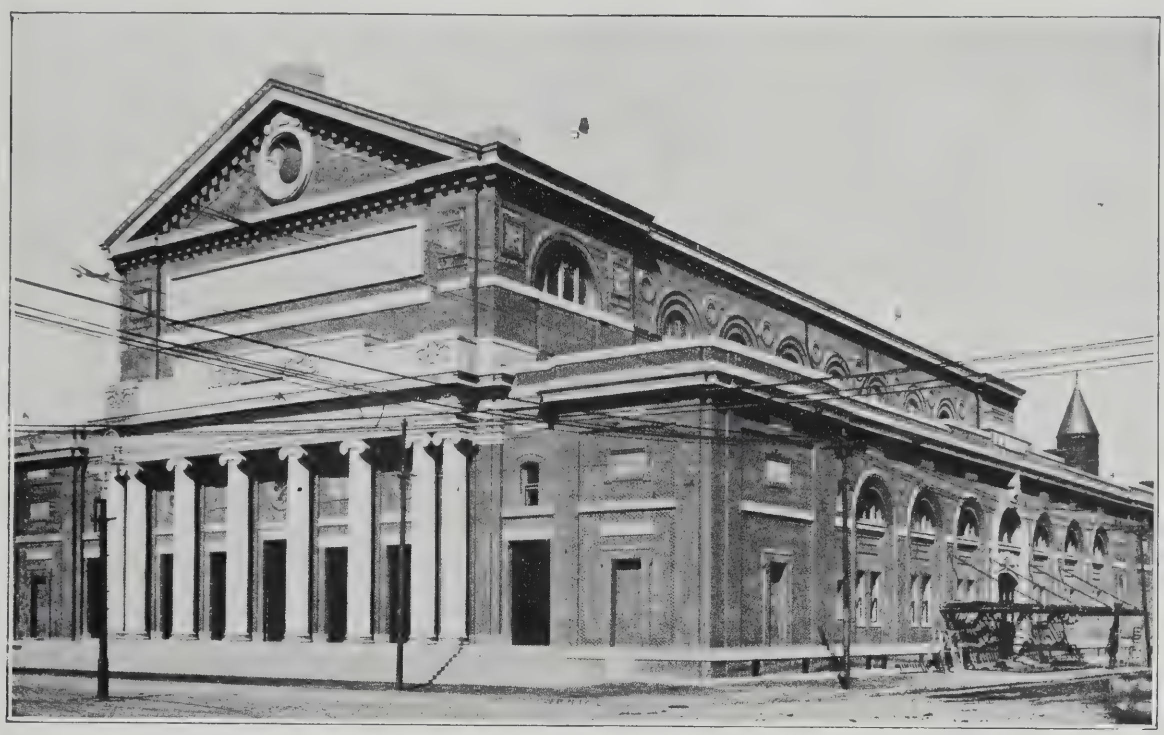
THE CONNECTICUT SAVINGS BANK, NEW HAVEN, CONN. GORDON, TRACY, & SWARTWOUT, ARCHITECTS.



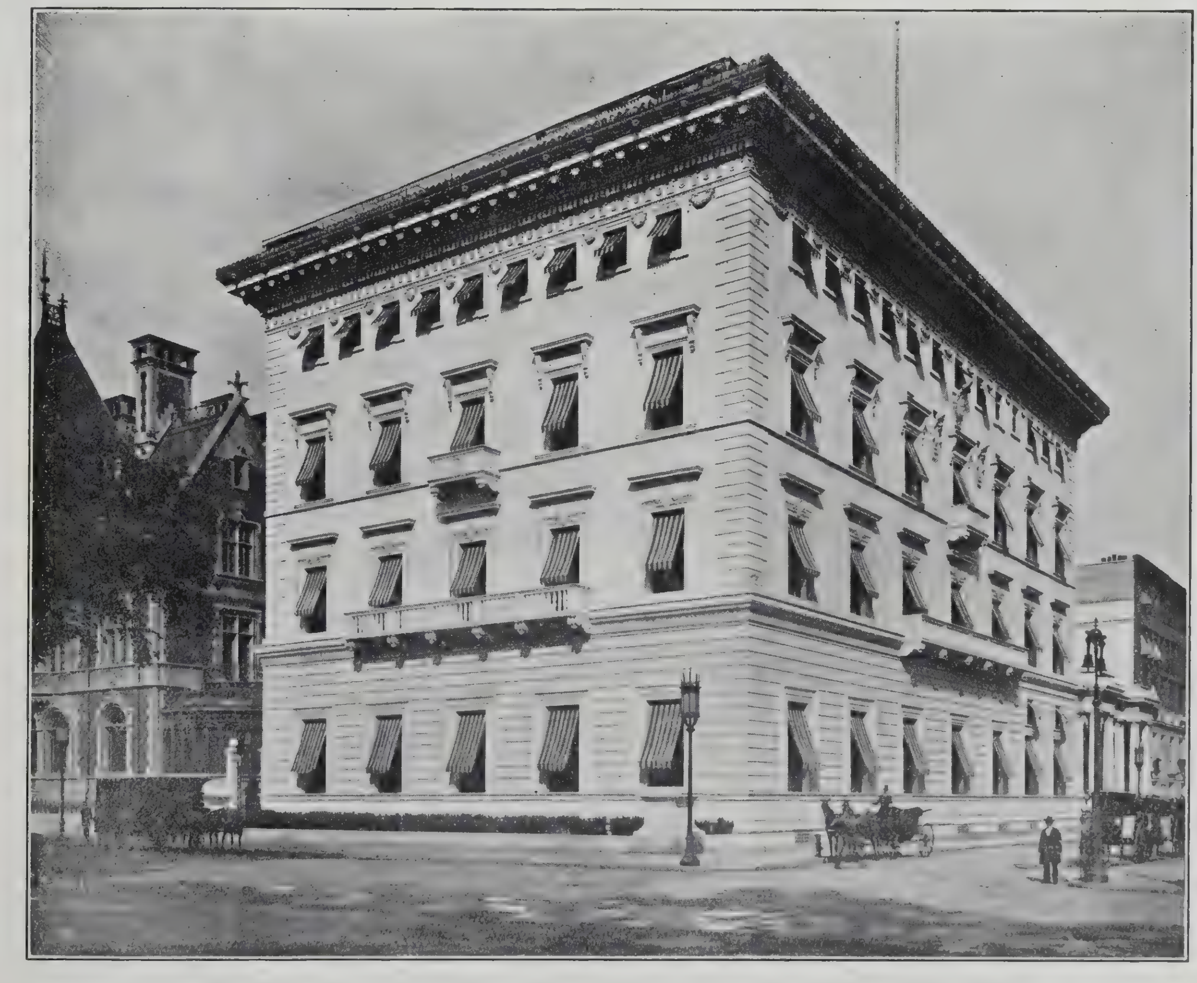
NATIONAL FARMERS' BANK, OWATONNA, MINN. LOUIS H. SULLIVAN, ARCHITECT.



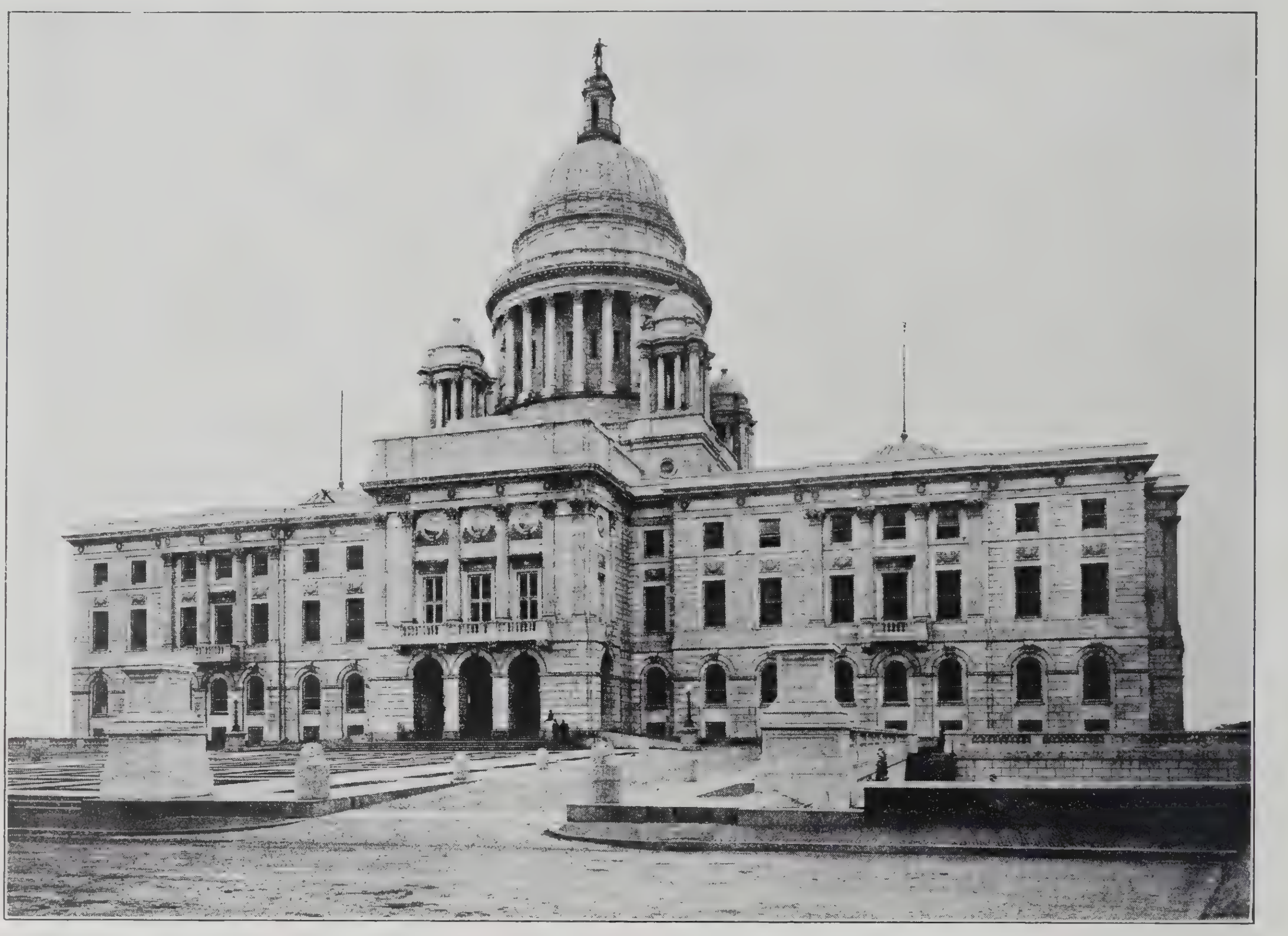
LIBRARY, COLUMBUS, OHIO: DETAILS. ALBERT RANDALL ROSS, ARCHITECT.



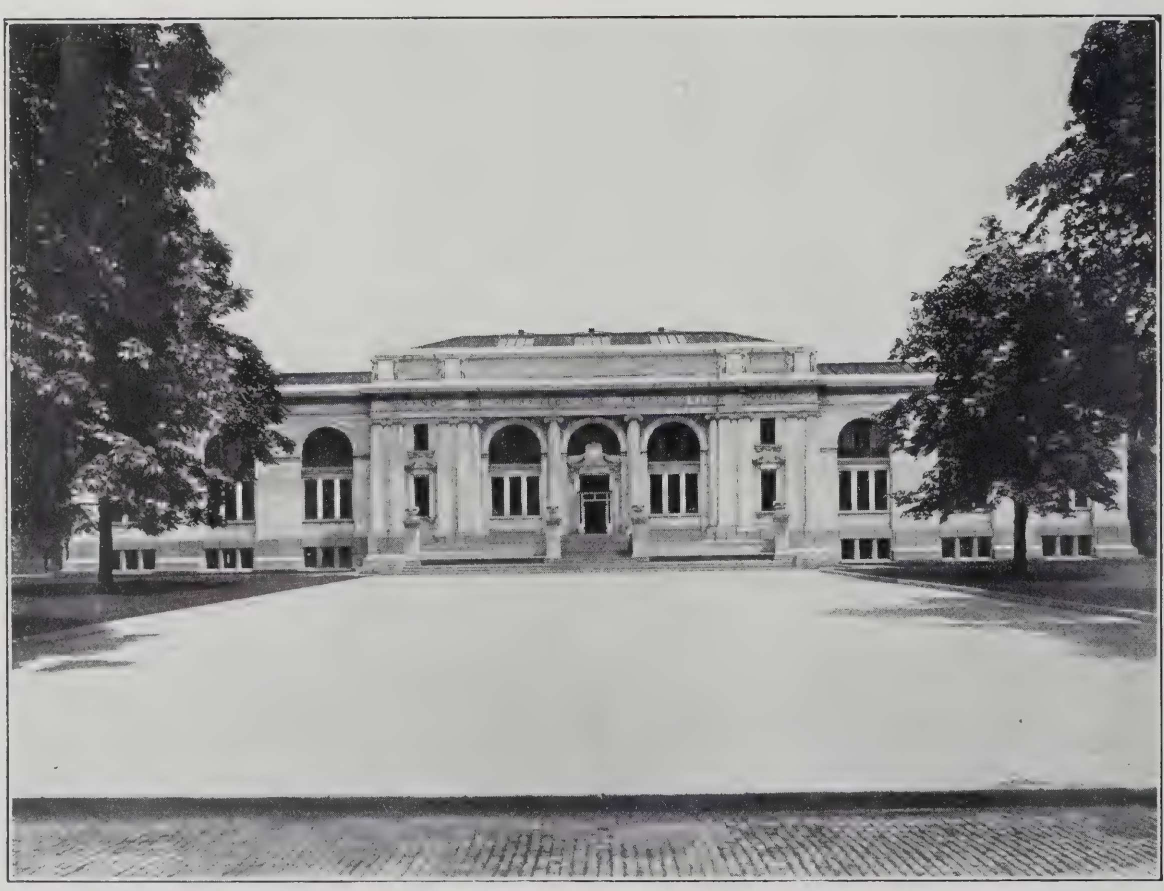
NEW MUSIC HALL, BOSTON, MASS. McKIM, MEAD, AND WHITE, ARCHITECTS.



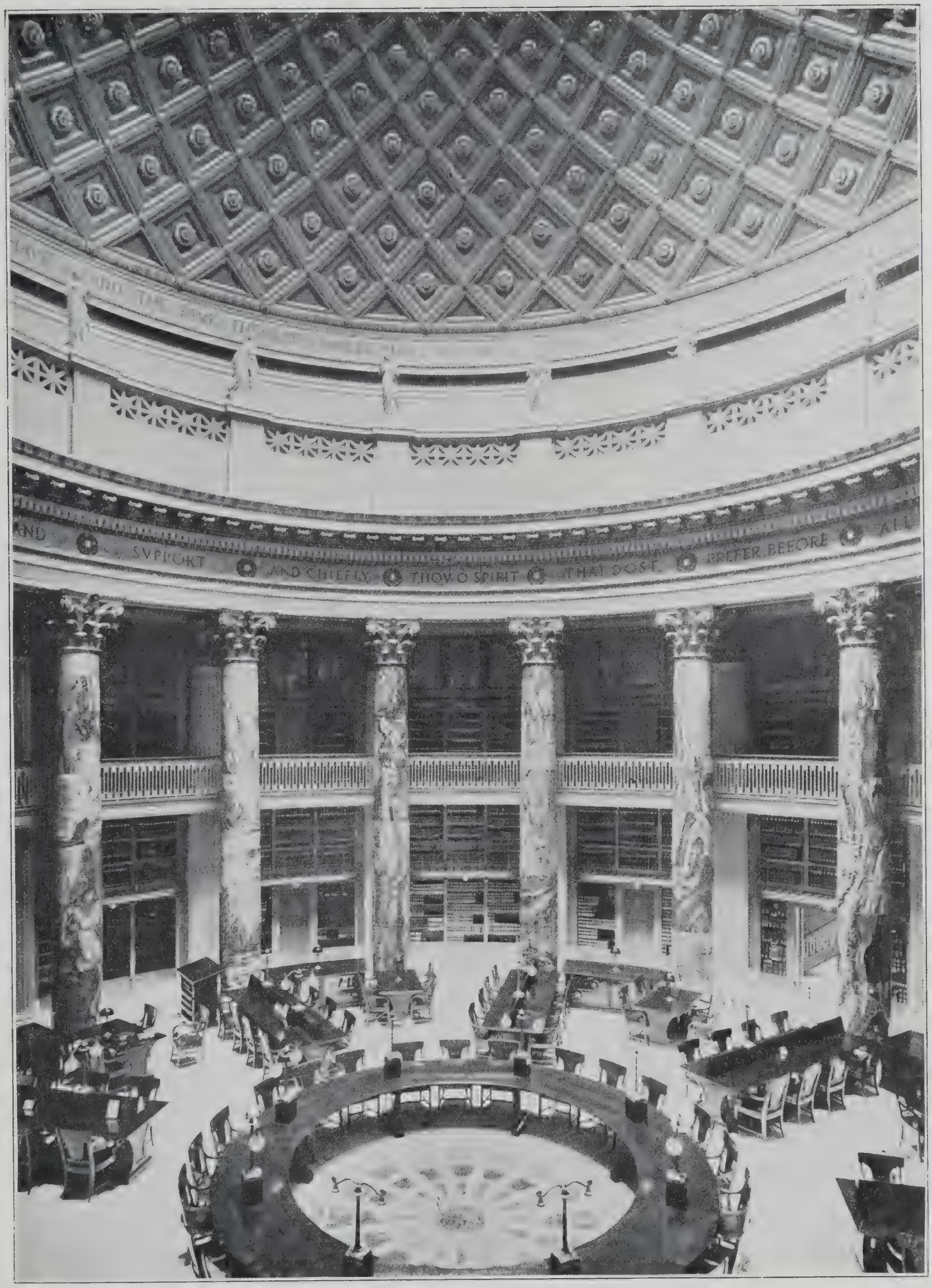
METROPOLITAN CLUB, NEW YORK. McKIM, MEAD, AND WHITE, ARCHITECTS.



RHODE ISLAND STATE HOUSE, PROVIDENCE, RHODE ISLAND McKIM, MEAD, AND WHITE, ARCHITECTS.



APPROACH TO THE LIBRARY, COLUMBUS, OHIO. ALBERT RANDOLPH ROSS, ARCHITECT.



NEW YORK UNIVERSITY, NEW YORK. INTERIOR OF LIBRARY. McKIM, MEAD, AND WHITE, ARCHITECTS.

and colour ornament. The stair-rail and balusters, too, recall a similar idea. Other than this, the house is more suggestive of artistic leanings of a travelled man of culture than of an active practitioner of the profession of architecture! The library, also the living-room, with its English bay with leaded casements, its bookcased walls with central mantel bearing the single picture in its old Spanish colour-tones, the tile facing painted by the owner in the style of some of the old Hispano-Moresque designs; and even the simple dining-room, with its predominating colouring of Spanish leather, the simple, heavy chairs, all, in greater or less degree, represent the same dominating personality.

The most personal note is in the retired workroom (please note that it is neither "studio" nor "den") perched up over the bay in the attic. Attractive such rooms always are—attractive merely because of their informality, their "sketchy" qualities! Here, a perfectly tremendous facing of Mercer tile, set without jointing of any kind, is perhaps the most important single feature; save possibly the big painting—found in an old Spanish-American church—that decorates the opposite wall. Before the open fireplace, with cupboard doors coming in unexpected angles of the room, glimpsing cherished plunder of even more eclectic appeal, one obtains a more illuminating idea of the dwelling artist's personality than is to be gathered from all the rest of the house. Even in New York, says the American writer, in a rather illuminating passage, that modern caravanserai, one cannot hope but that a note as individual and well considered as this will have something of an effect upon the passing dwelling fashion. Modest, instead of being pretentious; restrained in colour and ornament, instead of being flamboyant; unassertive in swelling bay or glare of plate-glass windows, it is perhaps almost the antithesis of the swaggering fashionable New York residence. All this is no more than should be expected of the home of a person of discrimination and refinement; but somewhat less than might have been done by so expert a Gothicist! Its saving trait is, throughout, to be found in that touch of modernity, testifying an alertness of perception that allows itself to be influenced by modern product and experience, while yet retaining a selective right that permits the use of only those best suggestions produced by modern architectural and decorative experiment, all these combine to render it perhaps the most intimate, attractive, and personal dwelling in a modern architectural Babylon!

New Phases of American Architecture.

The issue of the American "Architectural Record" of November, 1909, was a "Country and Suburban House Number," showing a "selected assortment" of country houses which have been completed during the past two years. Mr. A. C. David, who writes the introductory article, believes it to be a correct inference from this showing that the standard of American domestic architecture is slowly but steadily improving. What those houses show is not that the better American architect has abandoned or overcome his past failings, and has arrived at or anywhere near the goal of consummate domestic design, but that the tendencies in the right direction are every year becoming more emphatic. The time-honoured errors are less conspicuous than they were. Helpful and really formative influences prevail, with fewer hindrances and over a larger area.

BOSTON PUBLIC LIBRARY. McKIM, MEAD, AND WHITE, ARCHITECTS.

COLUMBIA UNIVERSITY LIBRARY. McKIM, MEAD, AND WHITE, ARCHITECTS.

The average well-to-do American business man brings a much more liberal group of ideas to the building of his house than he once did, and his architect has obtained, in consequence, a much better opportunity to do himself justice.

The Old Spirit.

The worst faults of American country residences in the past can be traced for the most part to the inexperience, the ignorance, and the perverted ideas of the average well-to-do house builder. The ordinary American of fifteen years ago conceived the architect as a sort of a broker, whose business it was to carry out his ideas. He usually bought his site and decided on the location of his house without taking any expert advice. He deemed himself quite competent to decide what kind of a house the site demanded, how it should be approached, in what direction it should face, what trees should be chopped down and where new ones should be planted. The owner's ideas about such matters would nearly always be wrong, or, at least, incomplete. If he was a very rich man, he probably wanted a much bigger and more ostentatious house than was warranted by the site. If he was a travelled man, he may have brought home from the other side the vision of some Italian palace or Jacobean manor house, which he must have, no matter how little they were suited to the surroundings. His requirements in respect to the plan were reached wholly irrespective of their necessary effect upon the design or their relation thereto. He was rarely willing to spend as much money as was necessary to build a really substantial house; and he was still less likely to understand the necessity of making liberal appropriations for the improvement of the grounds. The architect was encouraged to spend a good deal of money on wholly unnecessary embellishments, but he was denied the money necessary to the fundamental correctness of the design. His whole relation to his client was falsified from the start, because his average employer was not prepared to seek and trust his judgment in all really essential matters connected with the plan and design of the house.

The New Spirit.

Of late years these adverse conditions have, little by little, been very much ameliorated. All over the country certain architects have been establishing a sound and solid local reputation. They are engaged by their clients, because the latter prefer or have been told to prefer their work. Their clients come to them, consequently, not to demand the copy of a Tudor abbey or a Florentine villa, but to request them to design the sort of house they are accustomed to design. While in many ways the client may still make it difficult for the architect, the latter undertakes the work under much more favourable conditions. As a rule, he gets his work because people have been attracted by what he has already done. He brings a certain amount of personal authority and prestige into his relations with his clients; and under such conditions it is much more likely to be his own fault in case he fails to obtain the support necessary to the success of his work. In this way, and for this reason, the American architectural improvement, particularly in relation to domestic buildings, depends absolutely on the increased and increasing personal reputation of certain individual architects.

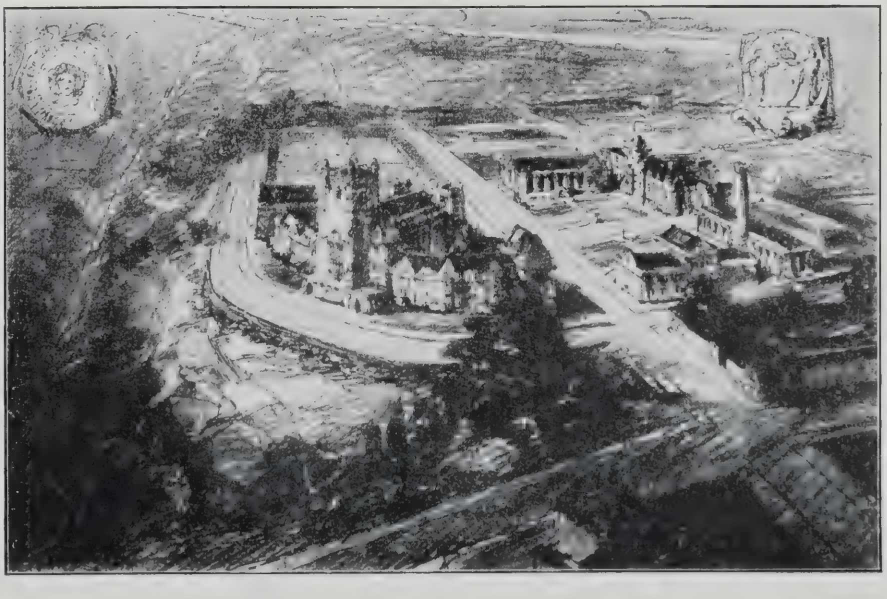
No More Suburban Palaces.

It is certain that many of the old errors are gradually being abandoned. American millionaires no longer build palaces on suburban lots. In fact, except in very rare instances, they no longer build palaces at all. Mr. John D. Rockefeller and Mr. Edward H. Harriman have, both of them, recently completed country houses which do not pretend to be palaces or even chateaux, which are situated on veritable country estates, and which are not too large in size to be the dwelling of an American citizen. In both of these instances money has been freely spent; but it has been spent not for the purpose of constructing a showy house, which would at best provide a wholly inappropriate setting for the lives of its inhabitants, but for the purpose of developing a genuine country residence. The money has been spent, that is, in the purchase of sufficient land, in the lay-out of the grounds and of gardens, and, in general, for the purpose of making the place interesting for sensible people to live in. These houses are the expression of a wholesome and many-sided interest in country life; and as such they inevitably assume a more genuinely domestic atmosphere.

In the Middle West the well-to-do family is tending towards the same goal by a somewhat different road. The rich people of that vicinity have, indeed, never shown any weakness for palatial villas. Their fault, if it is a fault, has been to spend too little rather than too much money on their houses. Even when very rich they have frequently been contented

COLLEGE OF THE CITY OF NEW YORK: MAIN BUILDING. GEO. B. POST, ARCHITECT.

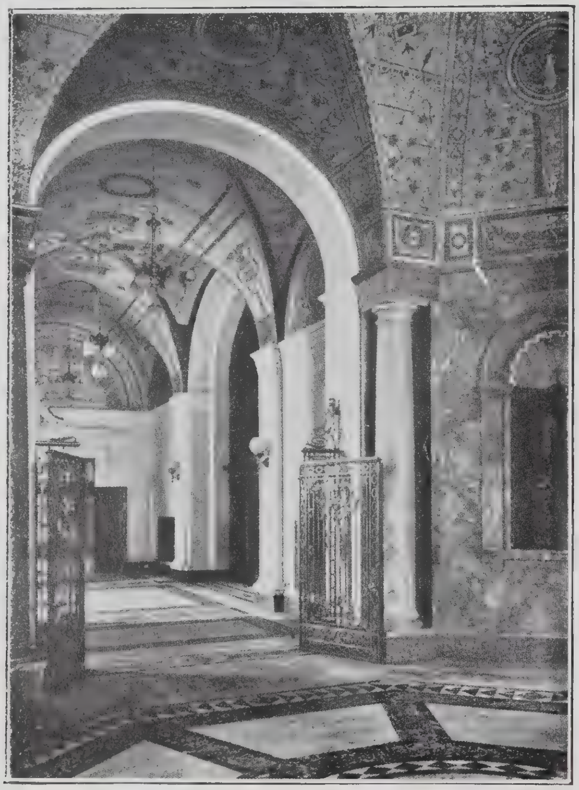
COLLEGE OF THE CITY OF NEW YORK: MAIN HALL. GEO. B. POST, ARCHITECT.



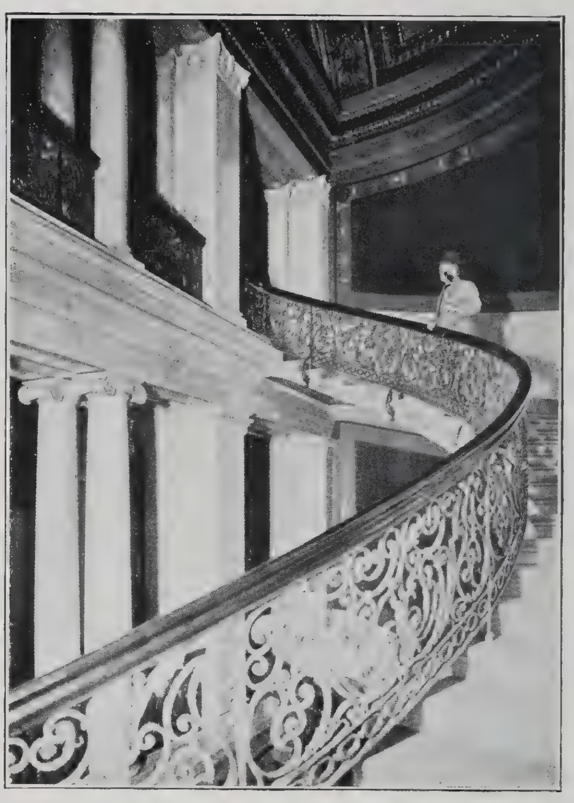
COLLEGE OF THE CITY OF NEW YORK: BIRD'S EYE VIEW. GEO. B. POST, ARCHITECT to erect semi-suburban houses on the outskirts of a large city, and without either any architectural pretension, or, as a rule, much architectural interest. These houses were the temporary residences of men who were still chiefly interested in business, and who did not have the inclination or the time to care very much how or where they lived. Of late years, however, men of this class in the Middle West have largely increased their fortunes, and have become more interested than formerly in the spending of their money. While still tied to their business, and while still but little inclined to assume the responsibility of very large country estates, they are tending to buy much more land than they once deemed necessary, to build more expensive houses and to spend money more freely in the lay-out of the grounds and of flower gardens. Two places are now being completed at Lake Forest, near Chicago, one for Mr. Harold McCormick and one for Mr. Philip Armour, which will in these respects establish a new standard for that part of the country.

More Uniformity of Type.

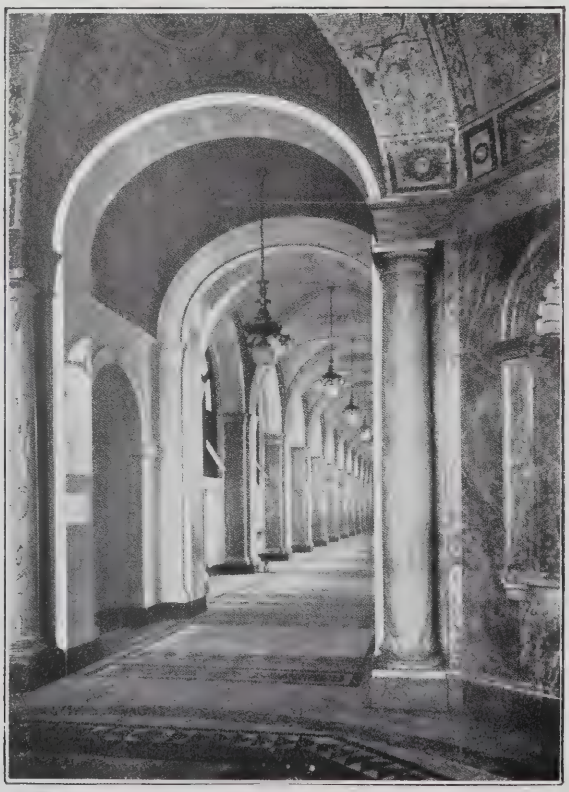
Hence it is that wherever in the United States country houses of any architectural pretension are being erected, they are tending much more uniformly to adhere to a certain type. This type, which is substantially that of an all-around country



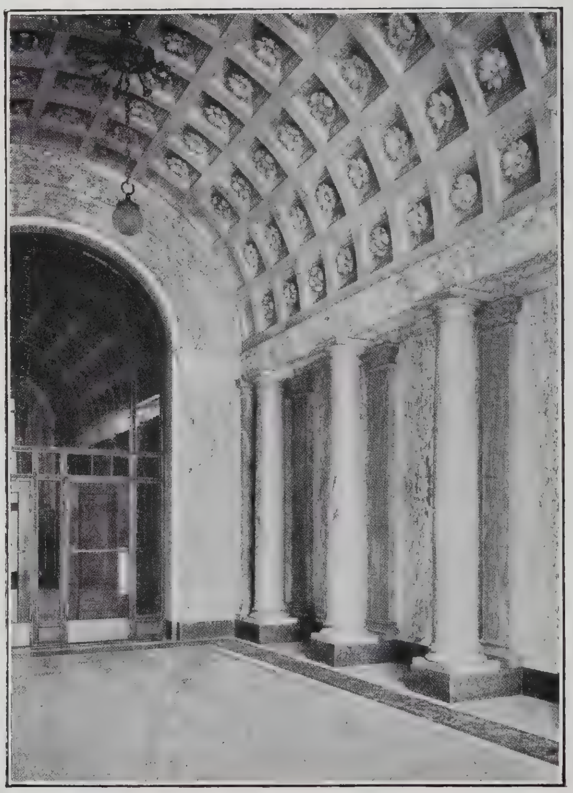
Detail of Entrance Corridor from Lobby.



Detail of Main Stairway.



Detail of Post Office Corridor.



Detail of Entrance Corridor.

UNITED STATES COURT HOUSE AND POST OFFICE, INDIANAPOLIS. KELLOGG, RANKIN, AND CRANE, ARCHITECTS.

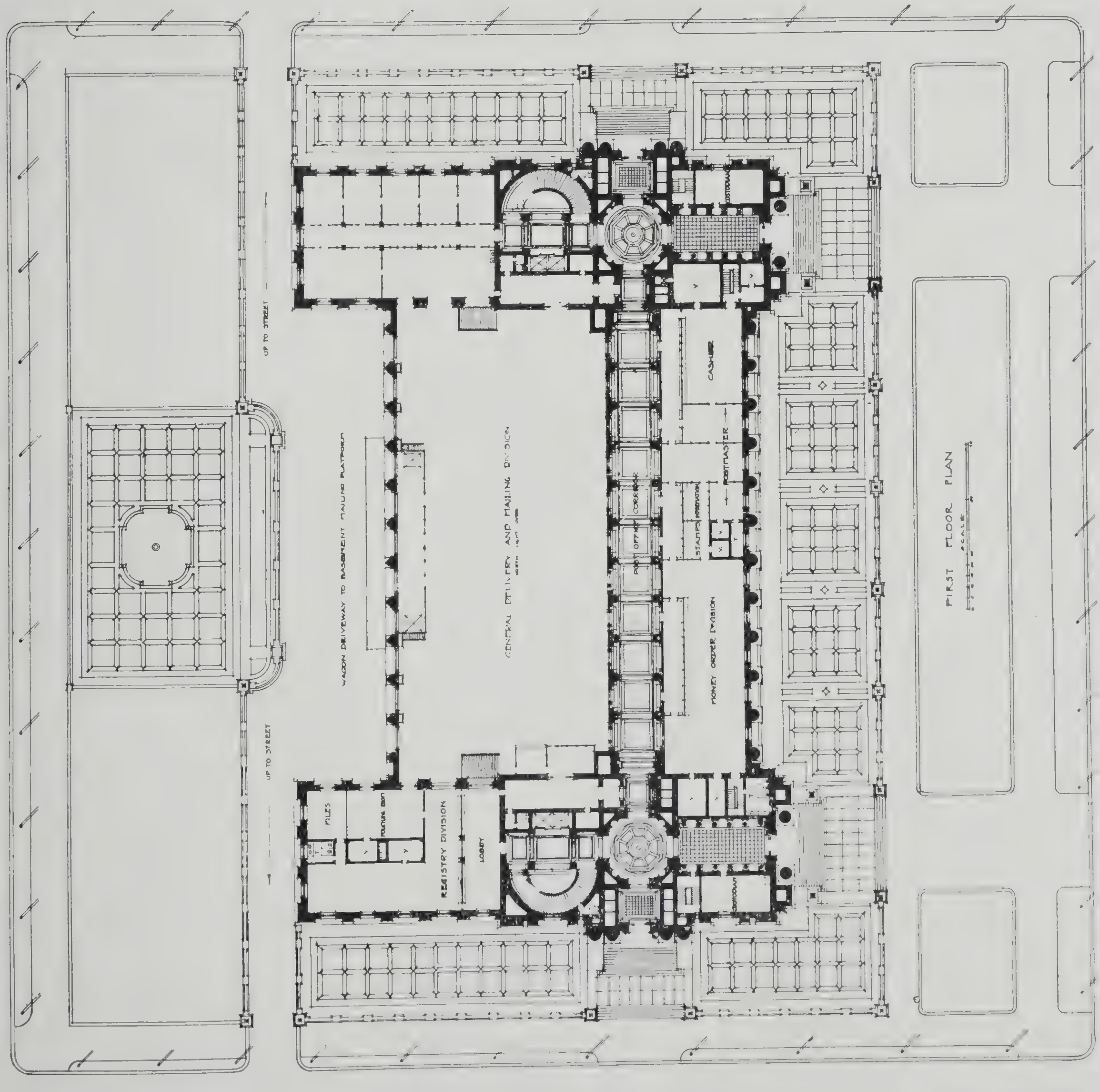
place, has always been found near Boston and Philadelphia; and now the well-to-do families in the other large American cities are coming to acknowledge its desirability —New Yorkers by the abandonment of their former weakness for superfluous ostentation, Western families by their willingness to pay for more substantial and more completely designed houses.

Because of these improved general conditions, a constantly increasing group of American architects are obtaining admirable opportunities for really excellent work; and they are showing their appreciation of these advantages by their success in stamping their buildings with their own individual architectural point of view and interest. An increasing number of very genuine personal successes are beginning to emerge above the architectural horizon —architects who are successes not merely because they have designed a large number of conspicuous buildings, but because their work is absolutely their own and is recognised as such by a loyal and a numerous following. It would be invidious to mention these gentlemen by name, because their numbers are still very small, compared to the total number of practising architects. It might be difficult to name more than fifteen men who have made for themselves the right kind of reputation, and whose work is characterised by the right kind of integrity and distinction. But these dozen or more gentlemen are scattered all over the country, and their personal styles, however they differ one from another, are emphatic and unmistakable. Wherever they appear they exercise a profound influence upon the architecture of their vicinity, both by affording desirable models for imitation and by educating a small but influential part of the public into understanding the rights and responsibilities of an architect in relation to his client.

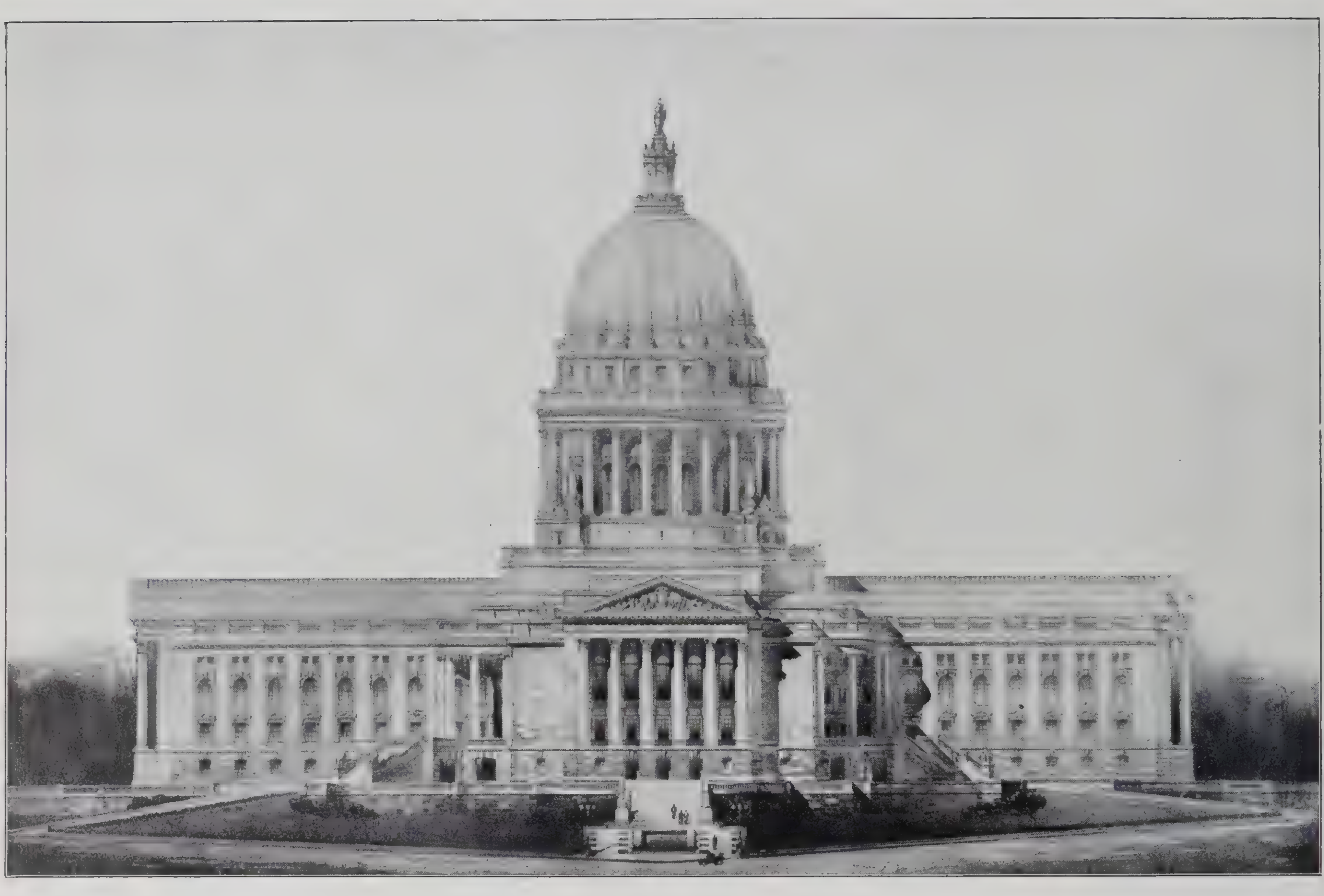
The architects whose work is noticed in the publication referred to above are: Charles A. Platt, J. Gamble Rogers, Chas. Barton Keen, Bosworth and Holden, Frank E. Wallis, Frost and Granger, Howard Shaw, Marshall and Fox, Spencer and Powers, Hugh Garden, Perkins and Hamilton, Pond and Pond, Bolinard and Parrson, W. A. Otis, Myron Hunt and Elmer Gray, W. Carbys Zimmerman, and Horace Trumbauer. We may perhaps be allowed to say, very frankly, that the work shown in the "Record" collection appears to us to be very much less worthy of study than the buildings of the classes that we have chosen for illustration. Roughly speaking, it is in the design of big buildings that the American architect excels. These exhibit his peculiar genius and his special characteristics, and it is to these, therefore, that we have devoted chief attention.

New Exhibition Buildings.

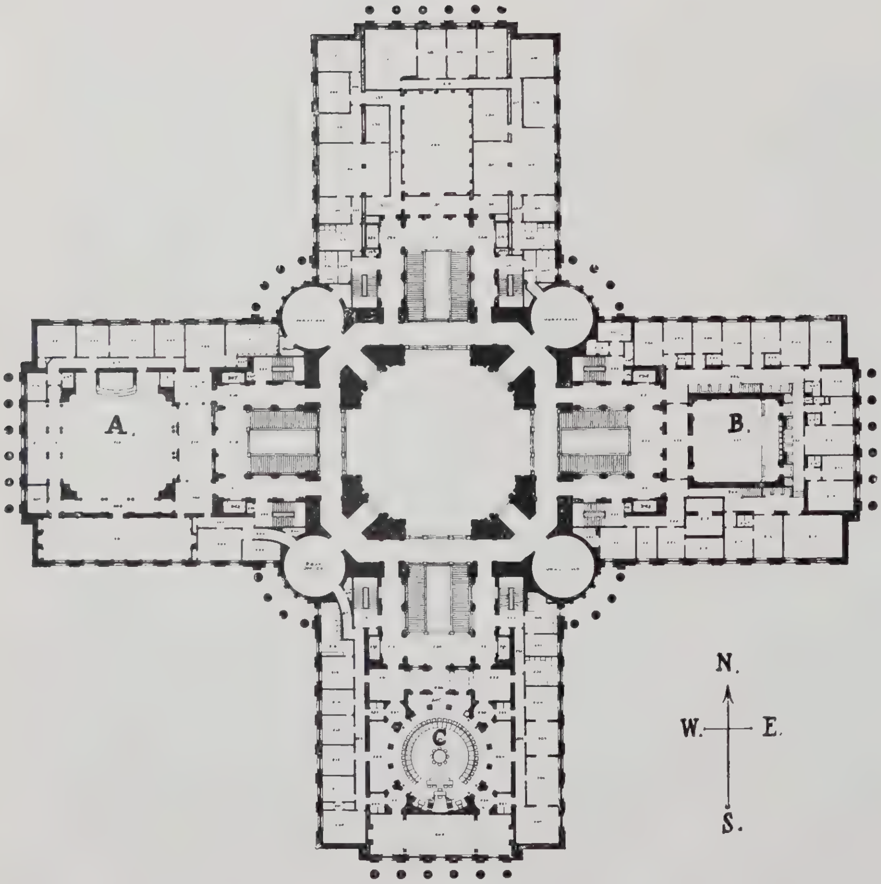
The Alaska-Yukon Pacific Fair, 1909, at Seattle, comprises some fine buildings, many of them constructed for permanent use. The site is on the grounds of the University of Washington, in the midst of a great fir forest on Puget Sound, and faces three mountain ranges, so that its surroundings are both picturesque and



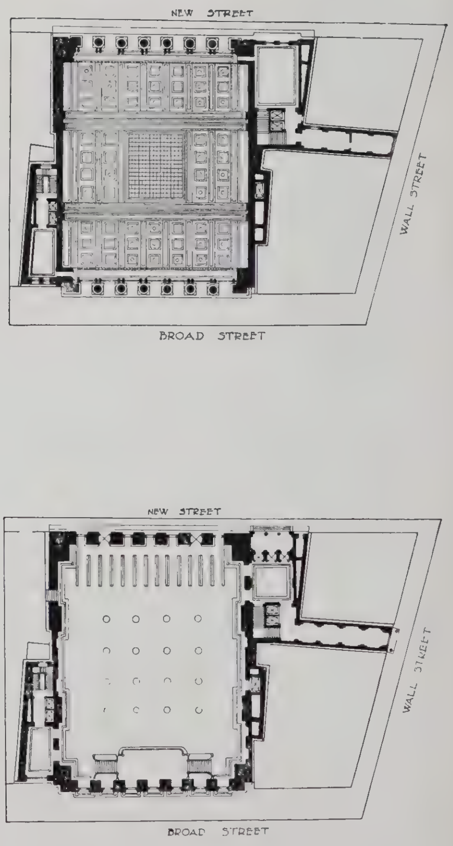
UNITED STATES COURT HOUSE AND POST OFFICE, INDIANAPOLIS, INDIANA: PLAN, KELLOGG, RANKIN, AND CRANE, ARCHITECTS.



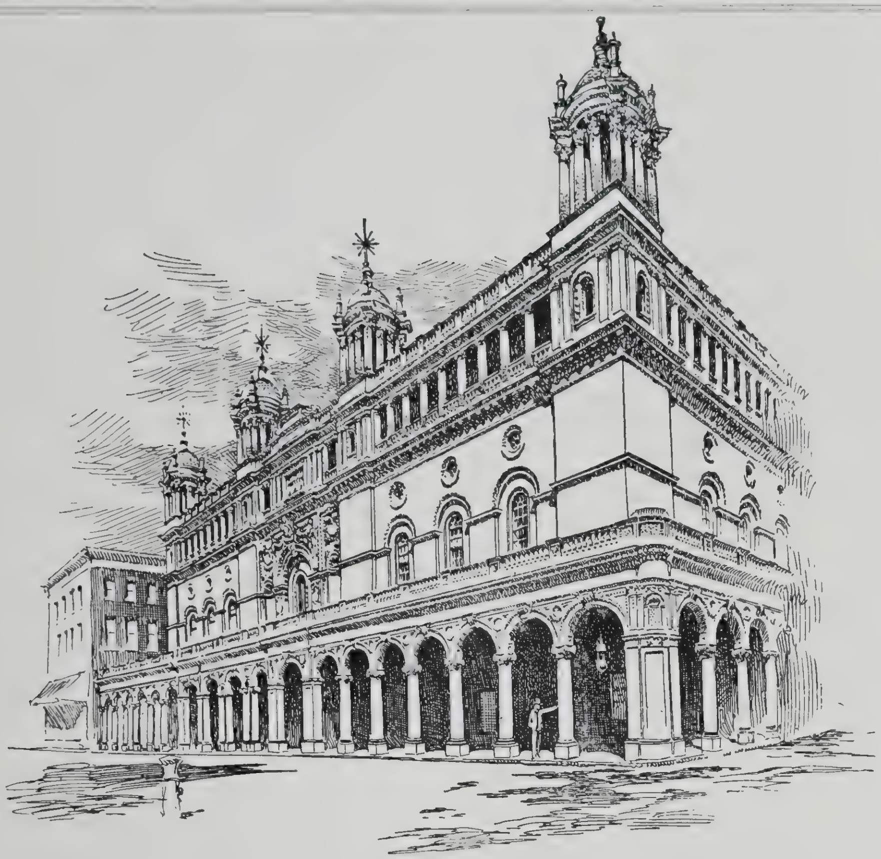
WISCONSIN STATE CAPITOL. GEO. B. POST AND SONS, ARCHITECTS.



WISCONSIN STATE CAPITOL: PLAN.



NEW YORK STOCK EXCHANGE: PLANS.



MADISON SQUARE GARDENS, NEW YORK. McKIM, MEAD, AND WHITE. ARCHITECTS.

unique. The Forestry Building can claim to be the largest log-house in the world, and there are other buildings for Agriculture, Manufactures, Fisheries, Mines, Fine Art, and Transportation, beside the Auditorium, the United States Government Buildings (including the Alaska, Hawaii, Philippines, and the Government Fisheries Buildings) and those of the foreign countries. The Washington State Building will cost £25,000, and there are also four county buildings. We show views of the Agricultural Building (pp. 604, 605), the Fine Art Building (p. 606), which is to revert to the University of Washington; the Washington State Fisheries and Mines Buildings (p. 607, and the Auditorium (p. 607)

A Canadian Bank.

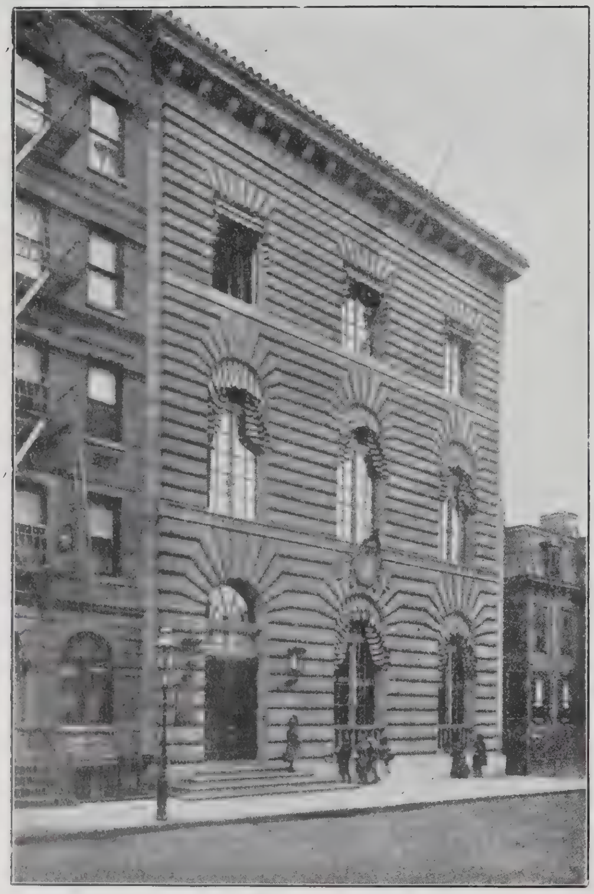
The Canadian Bank of Commerce, Montreal, of which three illustrations appear respectively on pages 570, 572, and 573, has celebrated the forty-second year of its life by moving its Montreal branch into one of the most modern and substantial bank buildings in North America.

The construction of this building represents one of the largest building contracts yet performed in Montreal. On May 5th, 1907, wrecking was commenced on the old Temple building, which was for many years situated on this site. The wrecking was completed in two months, so that work on the excavation for the new building was begun about July 5th, 1907.

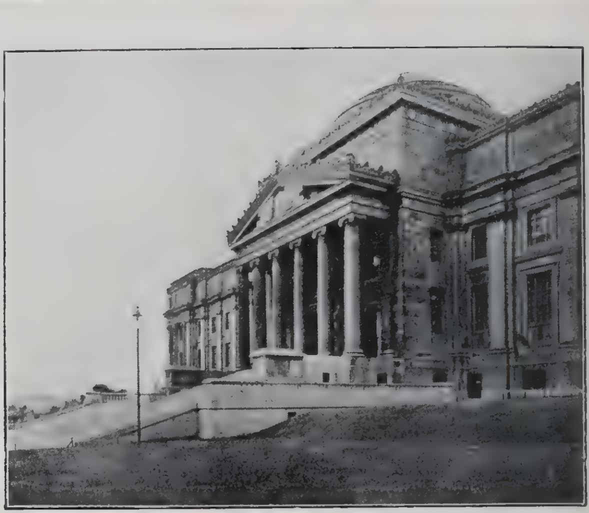
The building follows the Corinthian style of architecture. Granite was used in the stonework. The result is that a most imposing structure has been erected. The six granite columns, sixty feet in height and eight feet in diameter, stands well in front of the entrance. The granite façade behind extends across the entire width of the site one hundred and eighteen feet. Flights of stairs ascend from the street between the columns, which stands on granite plinths, the largest weighing twenty-six tons. In fact, the blocks forming this colonnade average twenty-six tons in weight, and the work of placing them in position was no mean engineering feat. The colonnade forms a loggia to the main wall, setting back fifteen feet from the street line. The blocks on the screen wall vary in thickness from two feet to two feet and three-quarters. To support this massive pile of stone, excavations were made to a depth of thirty-one feet below the level of the sidewalk on St. James Street. These excavations were far below any previous cuttings on this site, and near the bottom the cuttings ran into the bed of an old stream that passed through this spot ages ago. It was also shown in digging that a burying ground had formerly been on this site. The walls of the building are entirely of solid masonry. The furring is of tile and terra-cotta, the plastering of cement, the only wood in use being that which was necessary to fasten some of the wood flooring.

The main doors of the building are of plain beaten bronze. On entering the main building the banking hall is directly in front. This rises to the full height of the building, the only break being the windows on the sides. Corinthian pilasters reach to the top of the walls, relieving the plainness of the walls. At either side of the western end of the counting room are heroic-sized figures, standing boldly out in relief.. The flooring of the public space of the banking hall is of marble squares. Within the staff enclosure, the

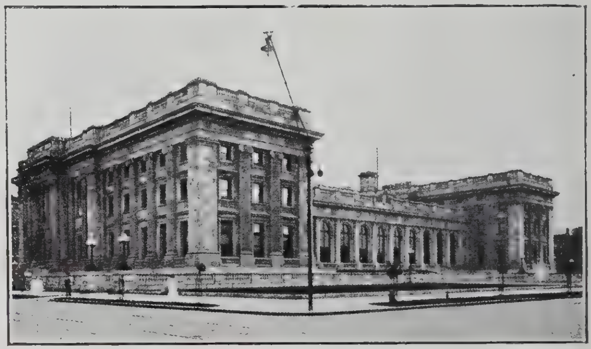
COLLEGE OF THE CITY OF NEW YORK: ENTRANCE, MECHANICAL ARTS BUILDING. GEO. B. POST, ARCHITECT. (SEE ALSO PAGE 595).



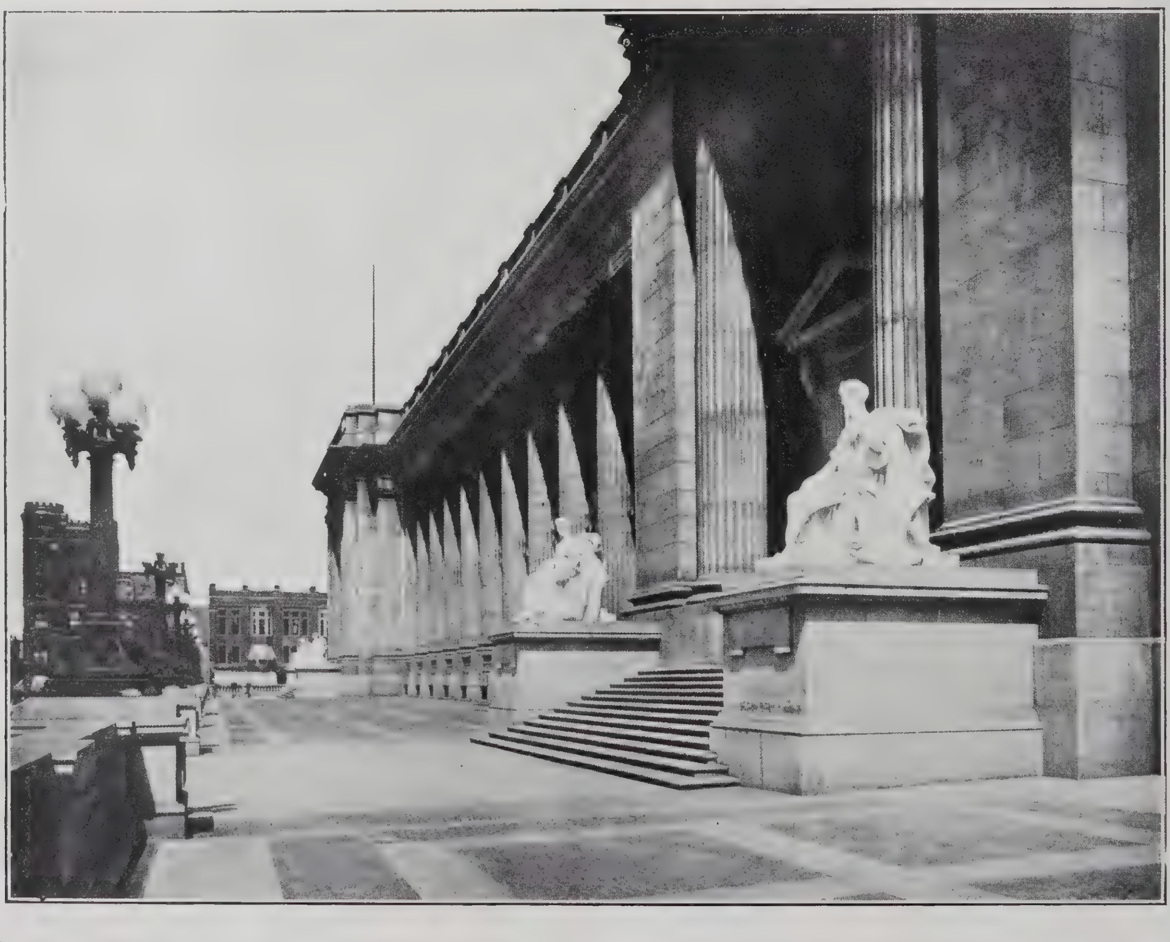
CARNEGIE BRANCH LIBRARY, NEW YORK. McKIM, MEAD, AND WHITE, ARCHITECTS



BROOKLYN INSTITUTE OF ARTS AND SCIENCES. McKIM, MEAD AND WHITE, ARCHITECTS.



UNITED STATES COURT HOUSE AND POST OFFICE, INDIANAPOLIS VIEW OF THE NORTH FRONT.



UNITED STATES COURT HOUSE AND POST OFFICE, INDIANAPOLIS, INDIANA: DETAIL OF FRONT. KELLOGG, RANKIN, AND CRANE, ARCHITECTS.

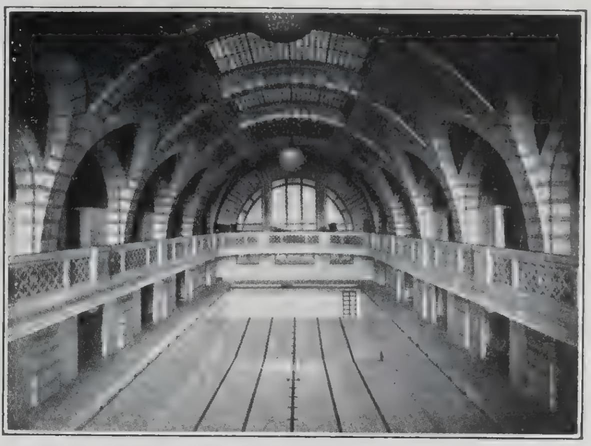
flooring is covered with cork blocks, three-quarters of an inch in thickness, making a noiseless and restful footing.

The grillwork dividing the counting room is of beaten bronze. The desks are of teak wood, and trimmings of ormolu bronze.

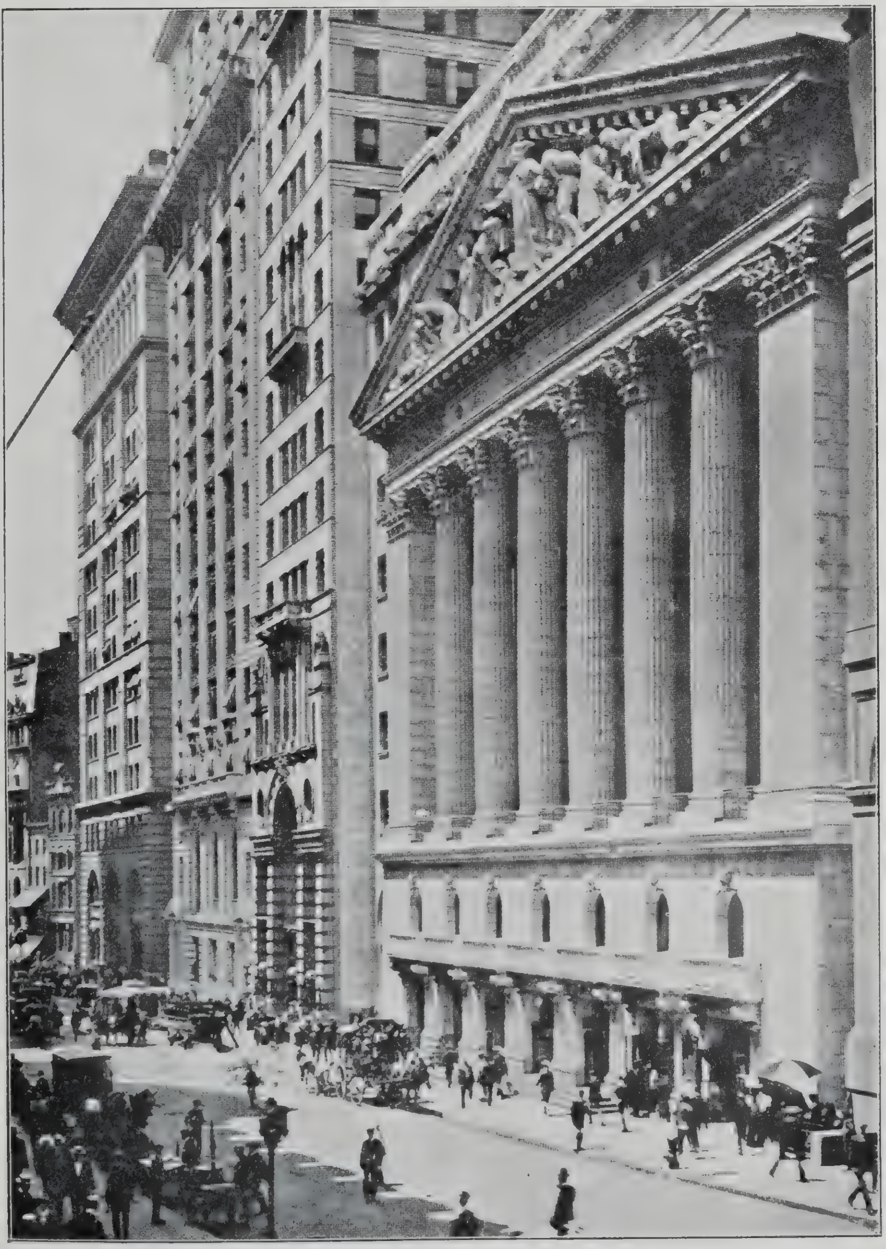
There are five vaults in the building. The safety deposit vault is seventeen feet wide by forty-eight feet in depth. This is the largest of the vaults.

The total weight of the strong-room doors is ten and a-half tons. The weight of the doors and their lining is thirty tons. The day gate is of burnished bronze, the frames and hinges being also brought to a bright finish, which contrasts well with the entire vault surroundings.

Six trusses span the banking room to support the roof and ceiling, the skylight situated directly over this room being 90ft. by 47ft. in width. There is a second skylight situated 15ft. above the one seen from the banking room. On the north side of the counting room five windows are placed. In these windows the glass has been treated to present a cloudy effect. The edges of the windows are of stained glass, a shield over each window. On the opposite side of the wall there are no windows, but glass doors lead to the board room and directors' room. The lighting in the building is by electricity.



SWIMMING POOL, PHIPPS NATATORIUM, PITTSBURG.
GROSVENOR ATTERBURY, ARCHITECT.



NEW YORK STOCK EXCHANGE GEO. B. POST & SONS, ARCHITECTS.

The Late Russell Sturgis and the Literary Side.

In an account of American architecture, it was inevitable that mention should be made of the late Russell Sturgis, who, dying in New York on February 11th, 1909, left the United States without a single representative of the literary side of the architectural profession who is also in active practice. There are Ware, Hamlin, Ricker, and other teachers and writers, but none who, like the late Henry Van Brunt and Mr. Sturgis, are active as practising architects, and to whom at the same time architectural criticism and writing is an avocation. Mr. Sturgis was born in Baltimore County, Maryland, October 16th, 1836, and graduated from the College of the City of New York, or as it was then known, the Free Academy, in 1856. He first studied architecture in the office of Leopold Eidlitz, and later in 1860 went to Munich. Here he devoted a year or more to architectural study, and his recreations were listening to the music of Wagner played at the Opera House; tramps through the country, where he found the castles of Louis, "the mad King," especially interesting, and in frequenting the famous picture galleries and museums of the city. It was probably through this early experience that he became in later years an art connoisseur and critic. His entrance into practice came shortly after his return from Munich in 1862. He joined P. B. Wight, afterwards the architect of the old Academy of Design, in offices at 98, Broadway, which they occupied together for about nine years, though not as partners. His earliest architectural work is found in the Yale University Chapel, and the Farnham and Durfee dormitories; and, in association with George Fletcher Babb, he designed the Gothic Savings Bank at Auburn. In New York, Mr. Sturgis designed a number of business blocks, and two houses for James Alfred Roosevelt and Theodore Roosevelt, the father of the late President of the United States. He was one of the first architects to use fireproofing materials in New York, and in building the

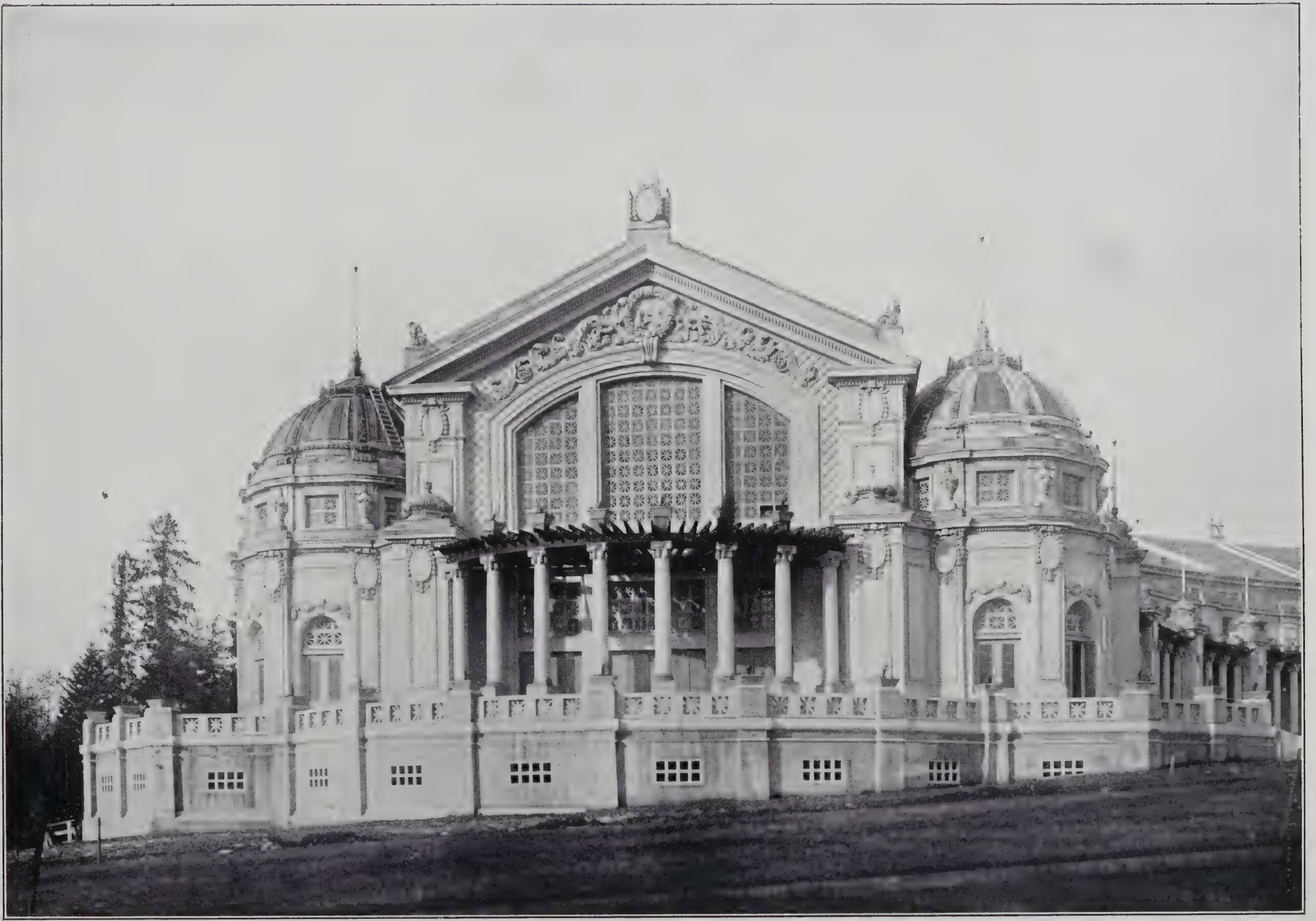


Photo · Topical.

The Agricultural Building. The Pergolas—one of which is seen on the extreme right—to be covered with flowering vines, are a feature of the fair.

BUILDINGS AT THE ALASKA-YUKON PACIFIC FAIR, SEATTLE.

Mechanics' and Traders' Bank at Albany used that material. Like that of Mr. Van Brunt, his architectural work was scholarly, and entitled him to respect, without showing the "impulse to create" that makes the artist. Since 1880, while he has always maintained an office and executed commissions, his work has lain along those literary lines which have made him the most famous architectural critic and writer of his time, and has given architecture in the United States a foundation for a literature. His writings cover all branches of the Fine Arts, commencing with that early work, written, it is said, in Venice, "Manual of Jarves Collection of Early Italian Pictures," and include "European Architecture," "An Historical Study," "Annotated Bibliography of Fine Art," "How to Judge Architecture," "The Appreciation of Sculpture," "The Interdependence of the Arts of Design," "The Appreciation of Pictures," "A Study of the Artist's way of working in the Various Handicrafts and Arts of Design," a revision of Lubke's "History of Art," "A Dictionary of Architecture," and, lastly, a "History of Architecture." This latter, the most comprehensive, and from a professional standpoint, most important of all his writings, was not finished, but it is hoped that from his notes and material it can be satisfactorily completed. Mr. Sturgis was in a way an American Ruskin. Though he had not the poetic idealism of that writer, he had a remarkable technical and historical acquaintance with his subject; his mind was a mine of accurate information, with a minute, ready and almost unimpeachably accurate knowledge of the history of architectural art. This was the more remarkable in that for a large portion of his life his eyes were weak and near-sighted, and often to save them he had to have almost everything read to him (he was practically blind while writing the first volume of his history of architecture); but in spite of the great nervous strain this produced, his love and appreciation for art, and his power of expression and suggestion was such as to make his works the most valuable of the century to the architectural student and practitioner. He became a Fellow of the Institute in 1865, was a member of the Architectural League, the Metropolitan Museum of Art, the National Academy of Design, the National Sculpture Society, and many local clubs.

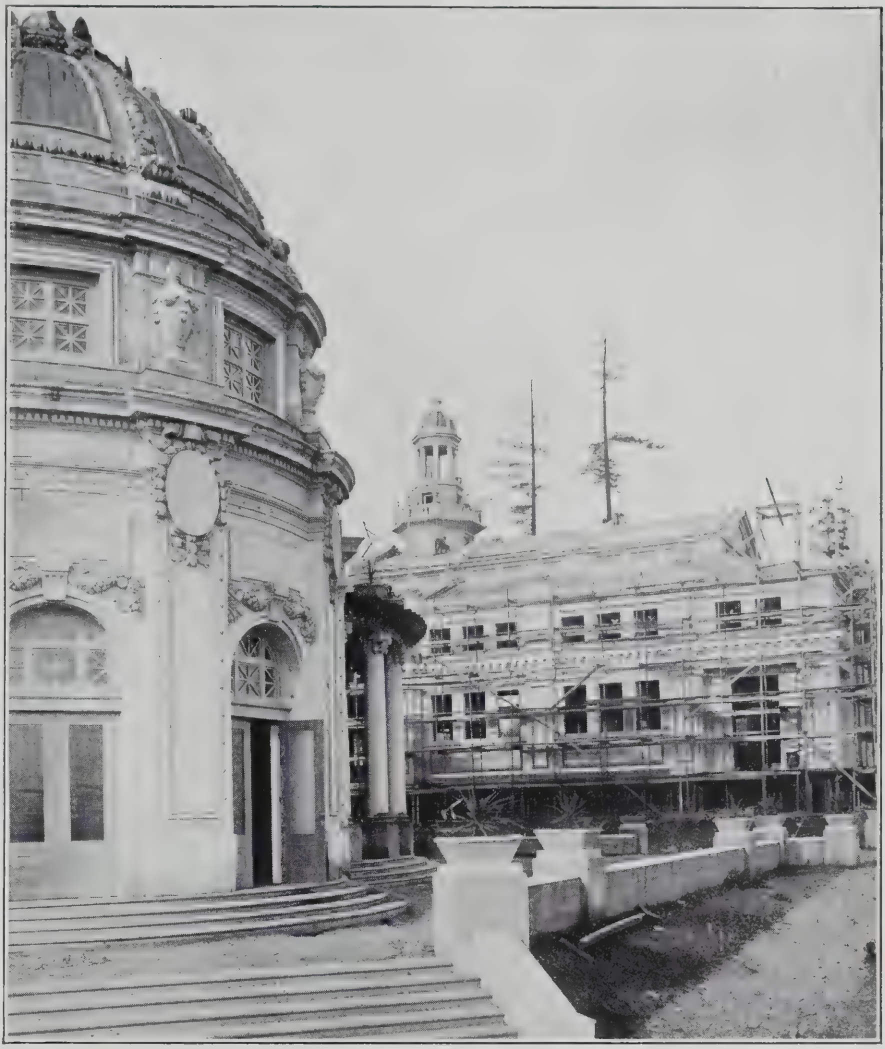
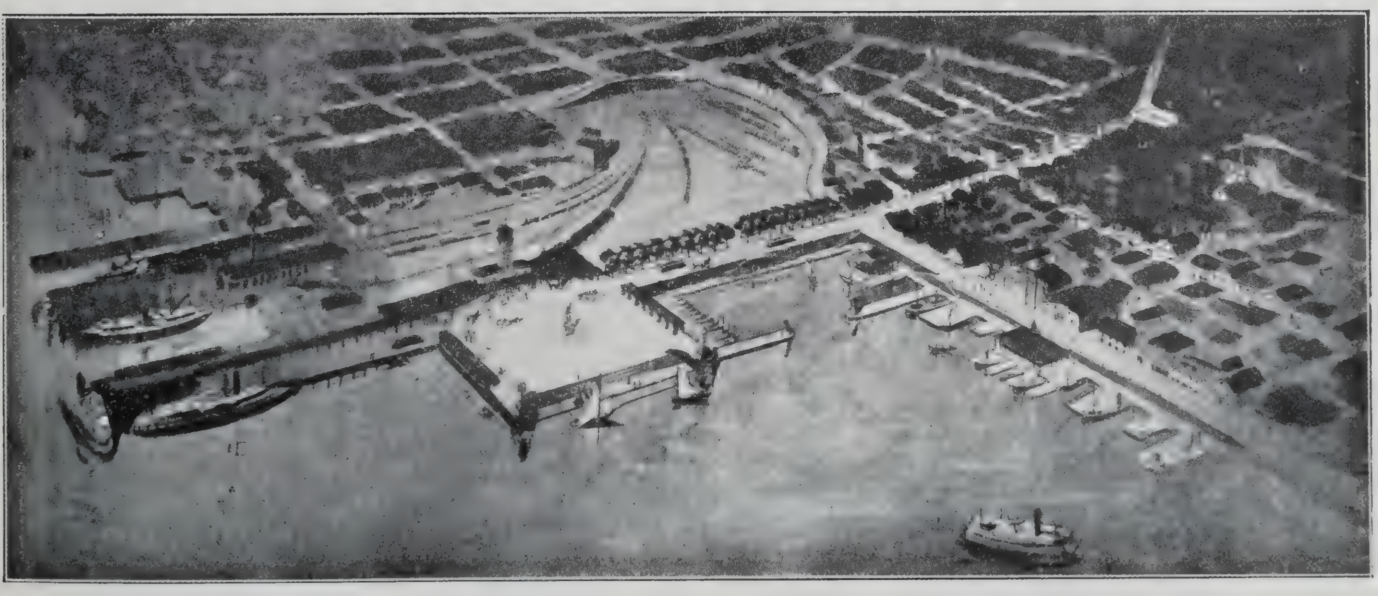


Photo : Topical.

ALASKA-YUKON PACIFIC FAIR, 1909: DETAIL OF THE AGRICULTURAL BUILDING.

American Courage and Resource.

The boldness with which the Americans attack and overcome difficulties that elsewhere would probably be held to be insuperable, is amusingly described with respect to the undertaking at Seattle, of which illustrations appear on pp. 602-5. When the development of any quarter is hampered by a hill, however abrupt, they cut it down overnight. If there happens to be a great hotel or other construction on the top of the hill, this is slowly lowered as the hill melts, and is found later, a horizontal geometric projection of itself, on a lower plane! This same spirit was shown by a body of men who lately took over from the State of Washington, on a long lease, the tract of vacant land, almost in the heart of the city, which was formerly the site of the State University. This



SUGGESTED IMPROVEMENTS, NEWPORT HARBOUR, RHODE ISLAND. GEO. 3. POST AND SONS, ARCHITECTS.

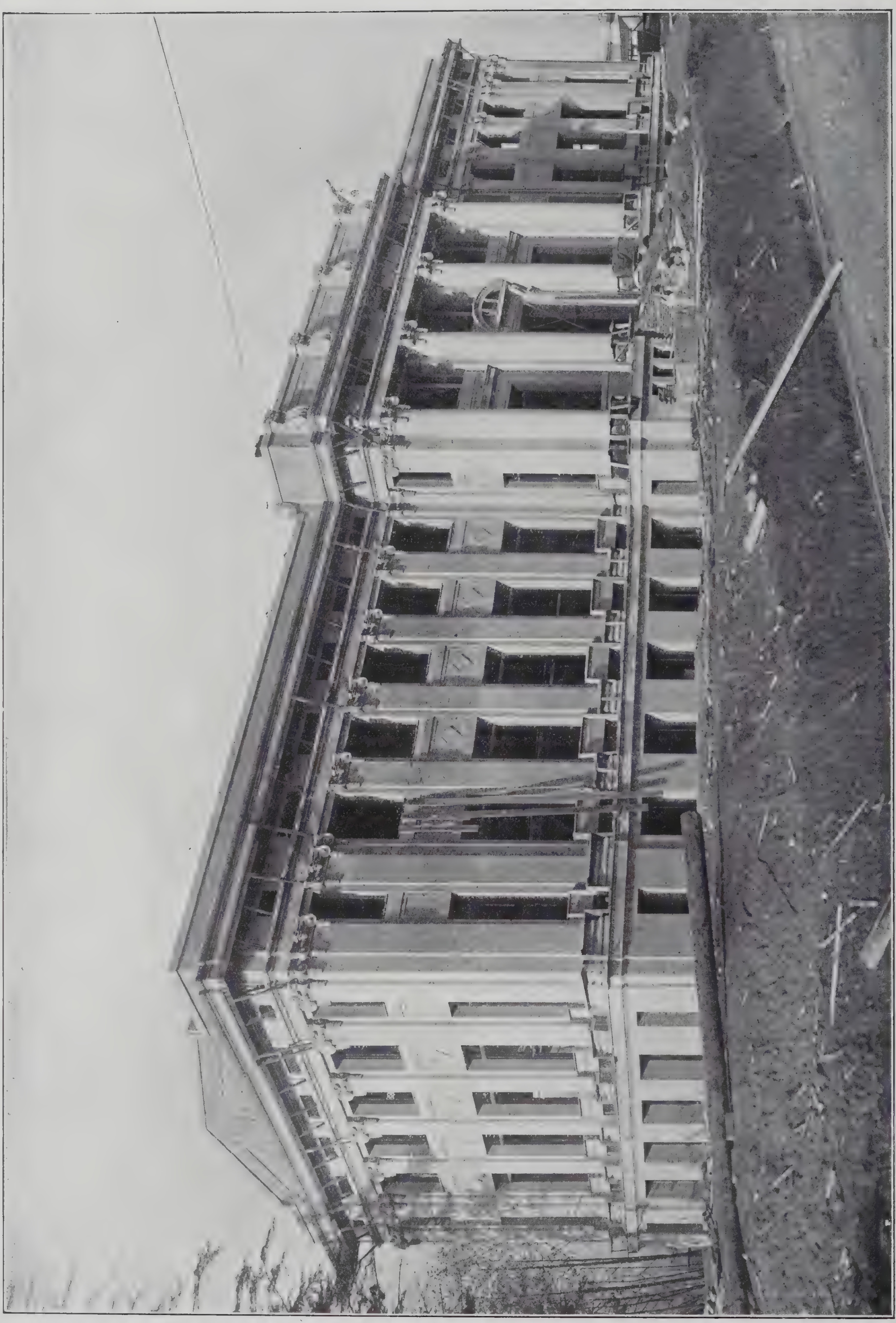


Photo: Topical.

The Fine Art Building. One of the permanent structures that will revert to the University of Washington.

BUILDINGS AT THE ALASKA-YUKON PACIFIC FAIR, SEATTLE.

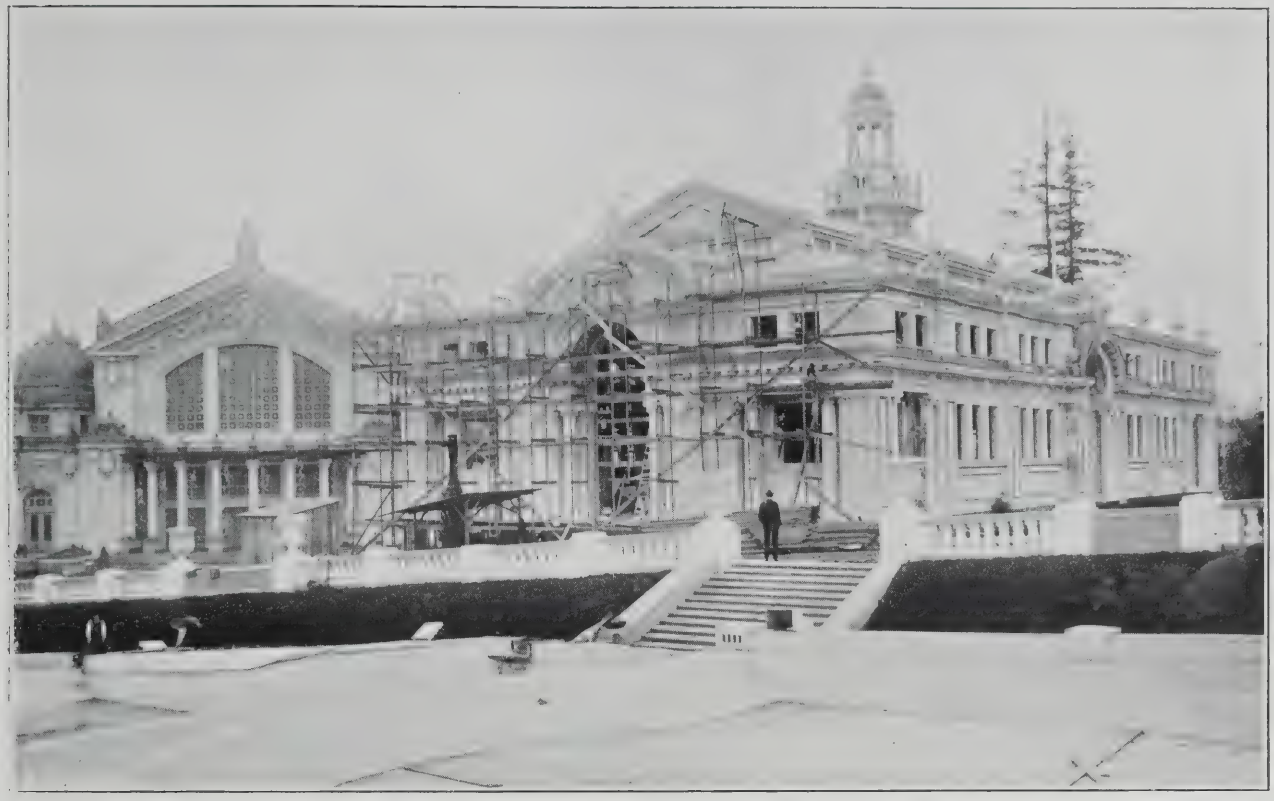


Photo: Topical.

THE ALASKA-YUKON PACIFIC FAIR, 1909.

Mines Building (*Left.*) The Washington State Fisheries Building (*Right.*)

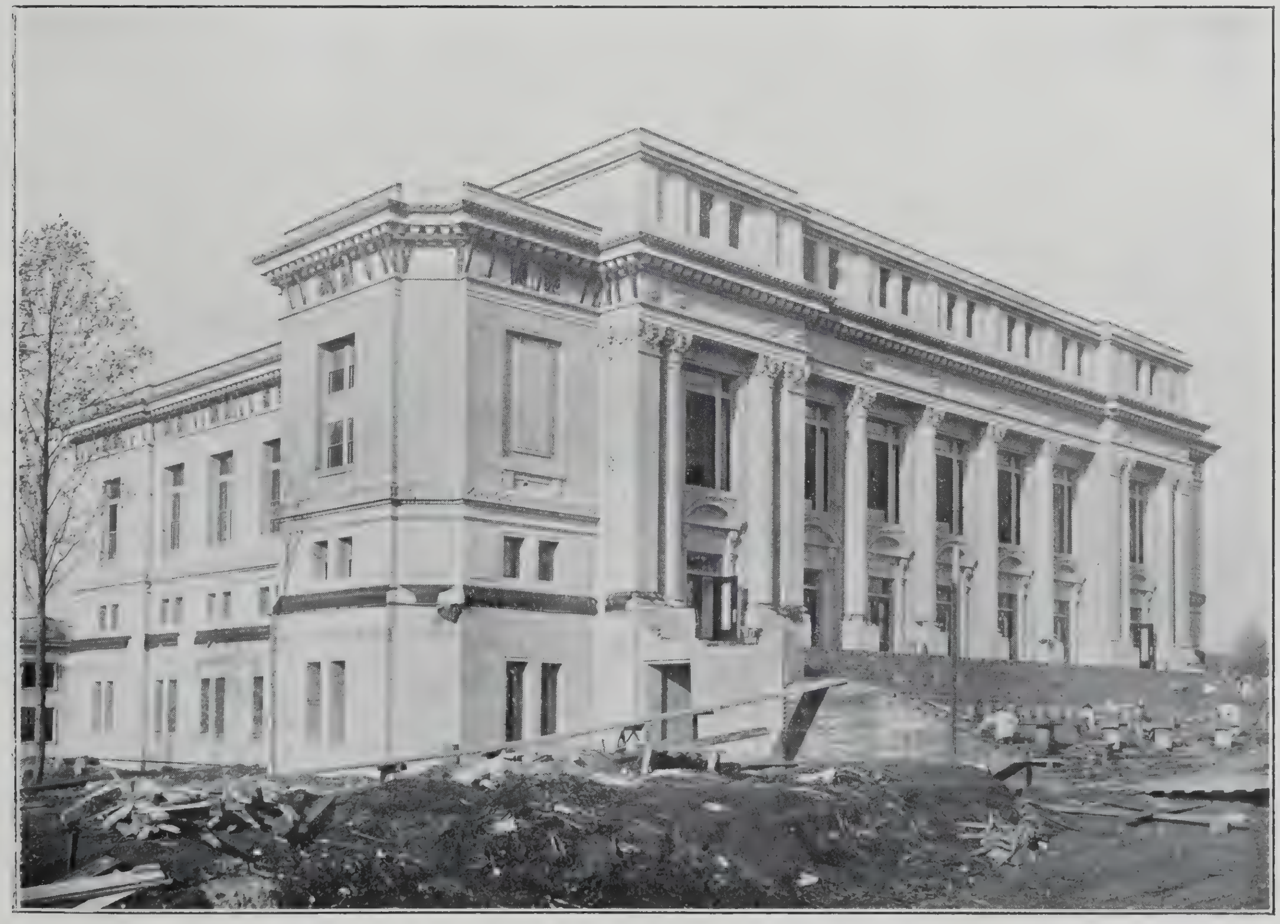


Photo: Topical.

ALASKA-YUKON PACIFIC FAIR, 1909. THE AUDITORIUM: ONE OF THE PERMANENT BUILDINGS.

Baltimore & Ohio Railroad Union Station
Washington D.C.

THE UNION STATION, WASHINGTON, D.C.: GENERAL VIEW. D. H. BURNHAM AND CO., ARCHITECTS.

covers an area of about eight small blocks, and the men who hold this lease, having formed the Metropolitan Building Company of Seattle, propose to cover this land with groups of buildings of similar aspect, uniform cornice height, and corresponding motifs and accents. Although the actual undertaking was only begun a little over a year ago, one office building is now completed and fully rented, a second is under construction, a third being drawn up, and a fourth in contemplation. It happens that this piece of land, once held by the State University, is actually, as nearly as can be calculated, the business heart of the city, and these groups of buildings will form a uniform business section unlike anything in America.

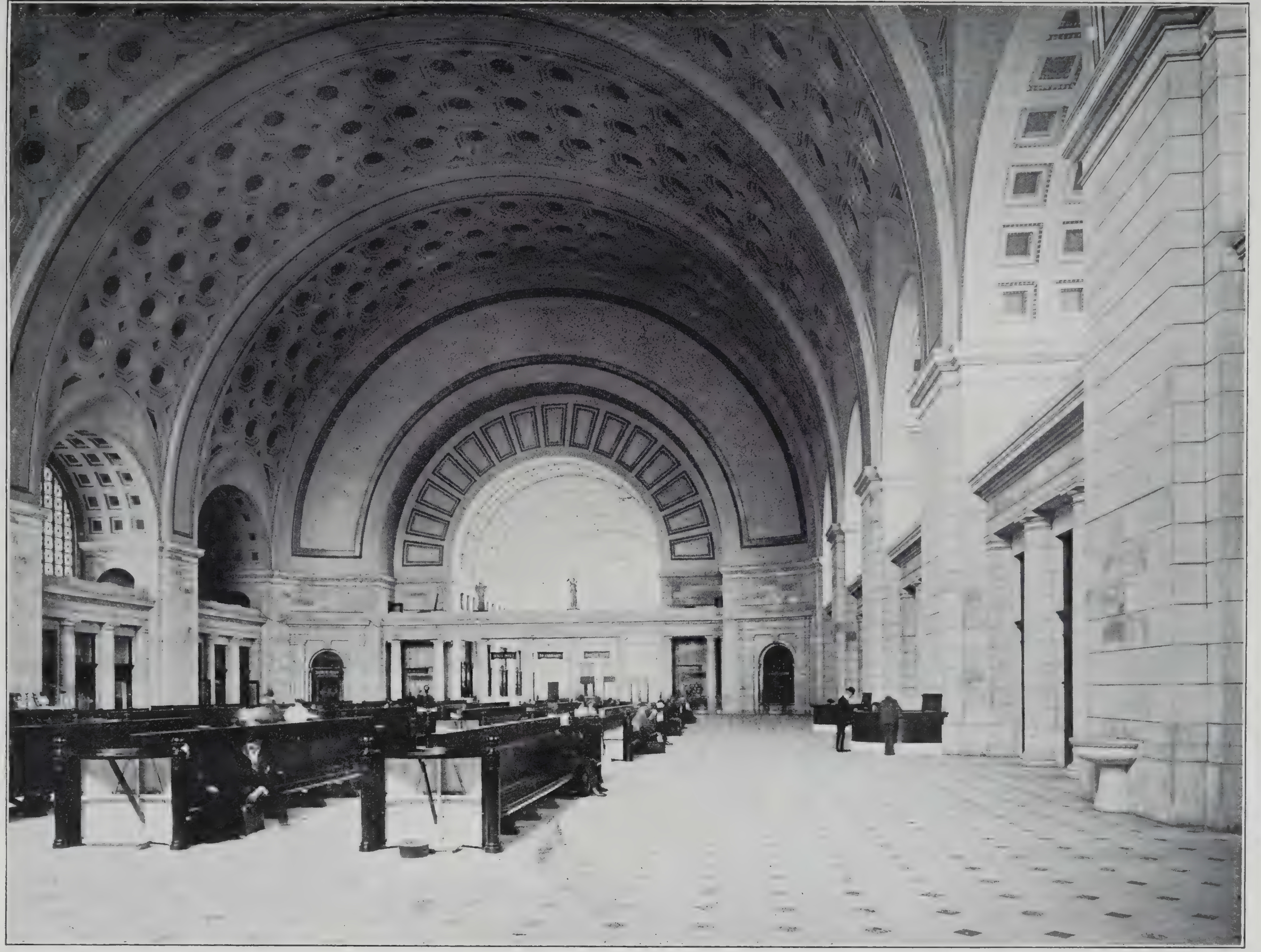
A Complicated Problem.

That, notwithstanding anything that may have been said conveying the contrary impression, American architecture suffers even as our own from the perversity and dilatoriness of Governments, may be seen from the chequered history of the New York City Court House. The conditions to be met are difficult. On the one hand is the abolition of the old court house, and on the other the preservation in structure and surroundings of the old city hall, "New York's best example of pure architectural beauty." In meeting these two requirements, there is a stupendous amount of planning to be done, both in arrangement of surroundings and in design. It is twenty years since the project was first taken up in a competition won by Charles B. Atwood, that brilliant designer who gained fame by a series of efforts of this character, and whose last work lives in that relic of the Columbian Exposition, the Field Museum. Shortly after his death in 1893 another competition was held, in which over one hundred architects participated. This was won by John R. Thomas. After each of these competitions, the legislature declined to authorise the carrying out of the work, objecting to encroachment on the City Hall Park space. Atwood's brilliant and artistic design would now be out of place, because at that time there were no skyscrapers, as now, to dominate it, and Thomas was recompensed with the commission for the Hall of Records, which was part of his general design. Now the Hall of Records Association has been asking for suggestions, and the latest is by Israels and Harder. The wisdom of seeking to obtain space for the required buildings, the demand for which has doubled since the Atwood competition, without encroaching on the beautiful City Hall or its small park, is commendable. The matter is of such moment to the future city, and so complicated in all its bearings, that it seems to go beyond the study of one architect and be taken up by an architectural commission similar to that which designed the Columbian Exposition, composed of three or five of the most capable of New York architects. With ample time to study the plans and design, a free hand in the work, with a surety of having all confidence and support given them by the people and city authorities, it seems possible that here can rise an architectural monument to twentieth century architecture that will meet with the same artistic approval that is accorded the city hall, the representative of the architecture of a hundred years ago.

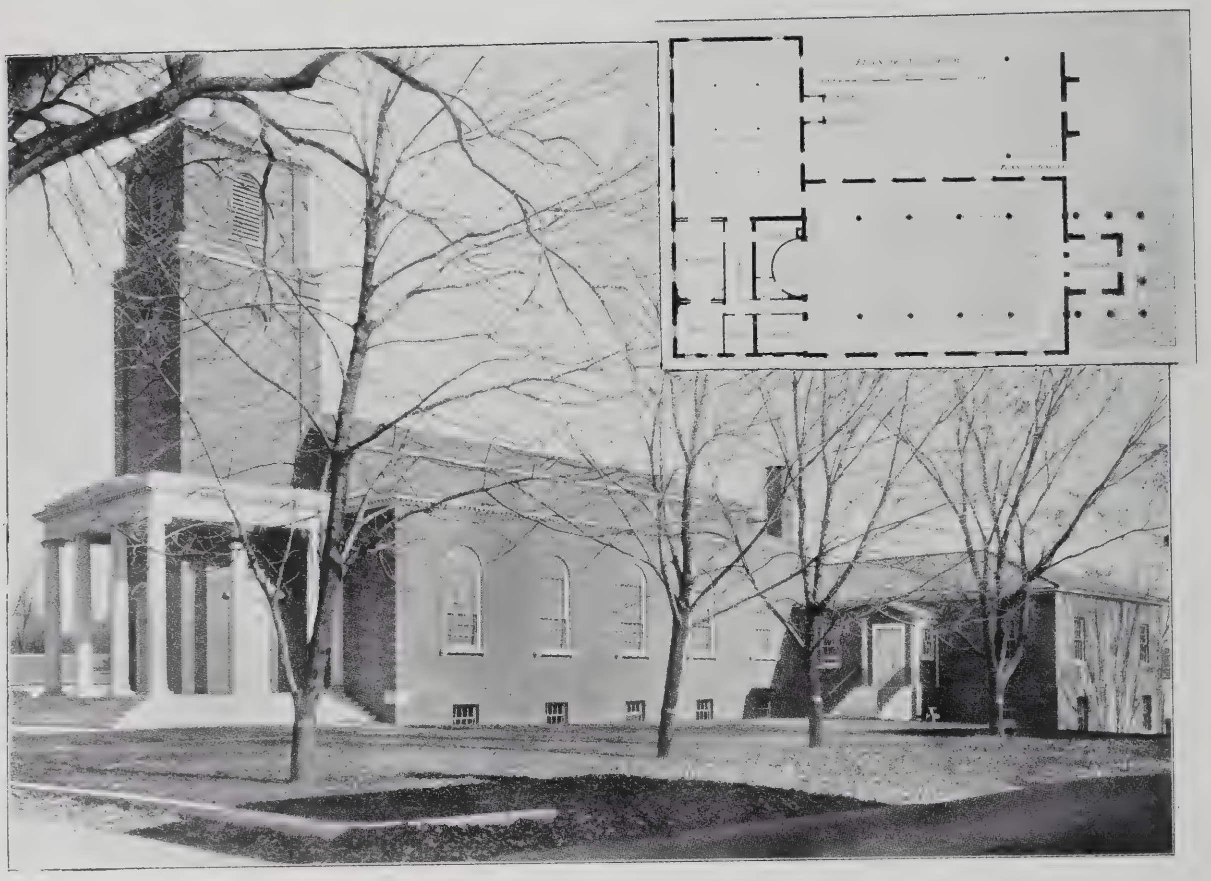
THE UNION STATION, WASHINGTON, D.C.: ENTRANCE PORTICO. D. H. BURNHAM AND CO., ARCHITECTS.

The Canadian Example.

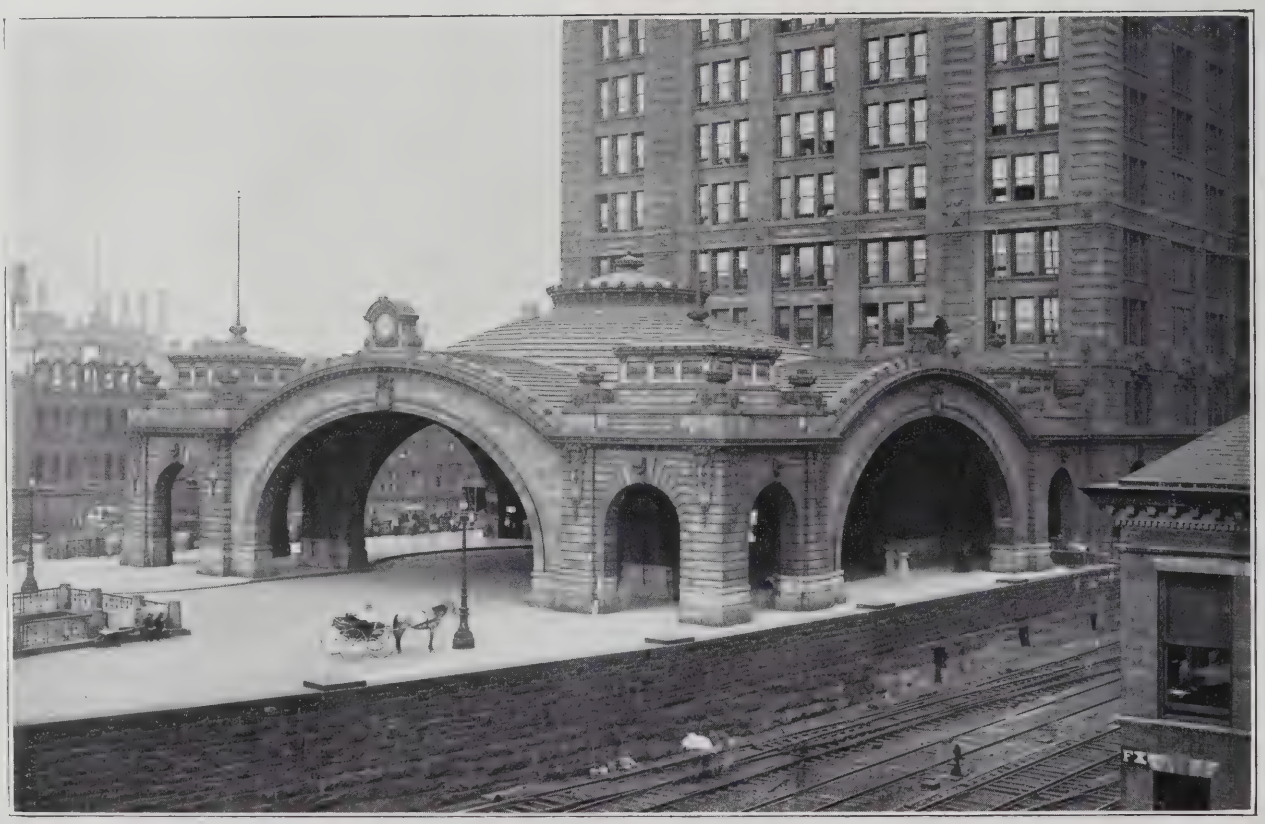
Some Canadians resent rather strongly the habit of excluding them from the map of America. The fact is that in England Canada is regarded politically rather than geographically, and consequently the Dominion is commonly treated as if it were an outlying part of England, or at least as a member of our own great family. In dealing, therefore, with Modern American Architecture we are chiefly concerned with the United States; but in order that our Canadian fellow-subjects may not suppose that we had forgotten that their fine country is an important part of North America, we have added the example of recent Canadian work shown on pp. 570-1, and described on p. 599.



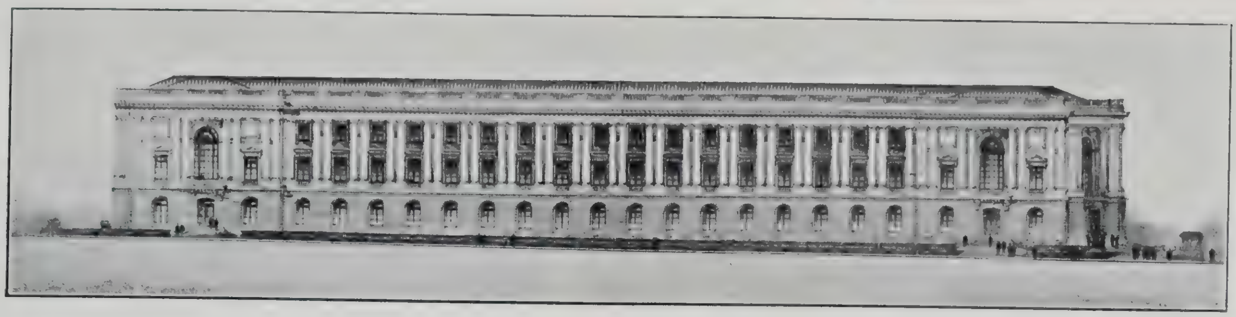
THE UNION STATION, WASHINGTON, D.C.: GENERAL WAITING HALL. D. H. BURNHAM AND CO., ARCHITECTS.



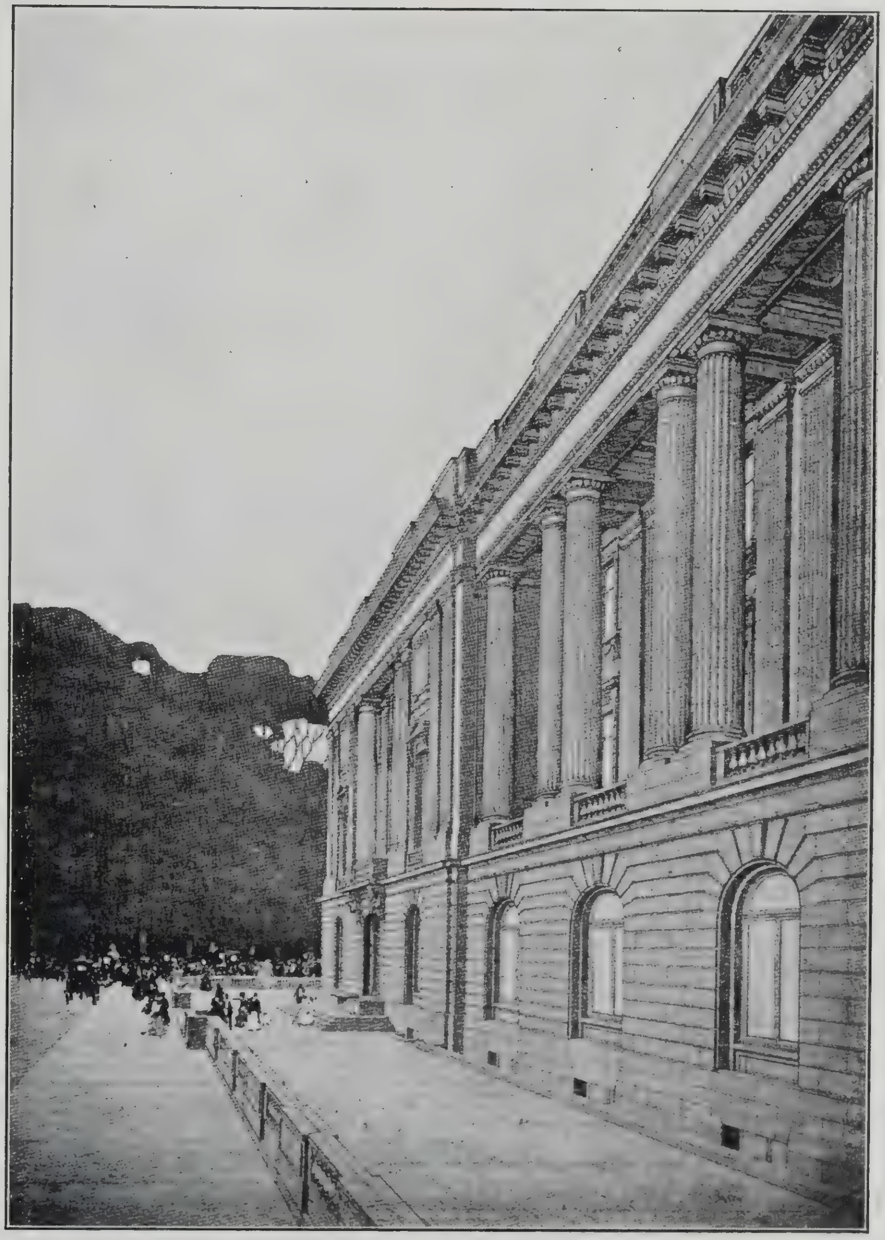
FREE CHRISTIAN CHURCH, ANDOVER, MASS. McKIM, MEAD, & WHITE, ARCHITECTS.



UNION STATION, PITTSBURG, PA. D. H. BURNHAM AND CO., ARCHITECTS.

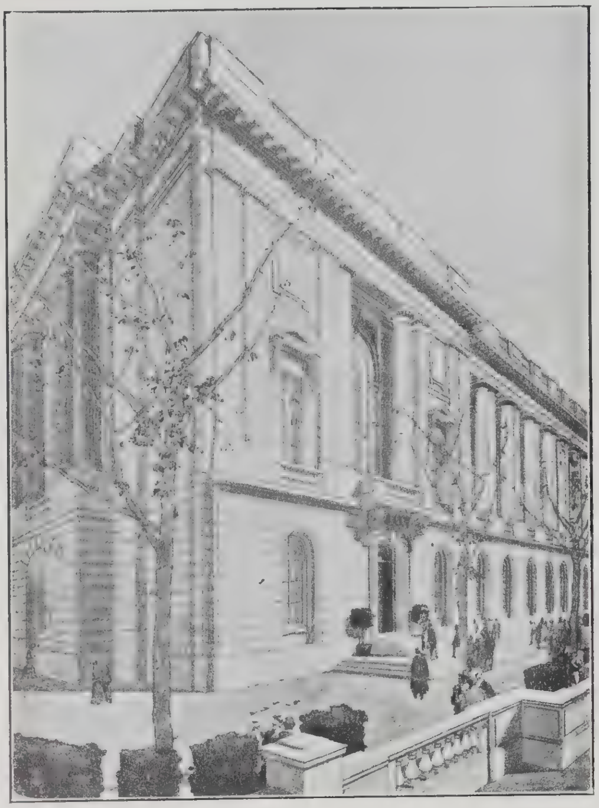


OFFICE BUILDING OF THE MEMBERS OF THE HOUSE OF REPRESENTATIVES, U.S. CAPITOL.

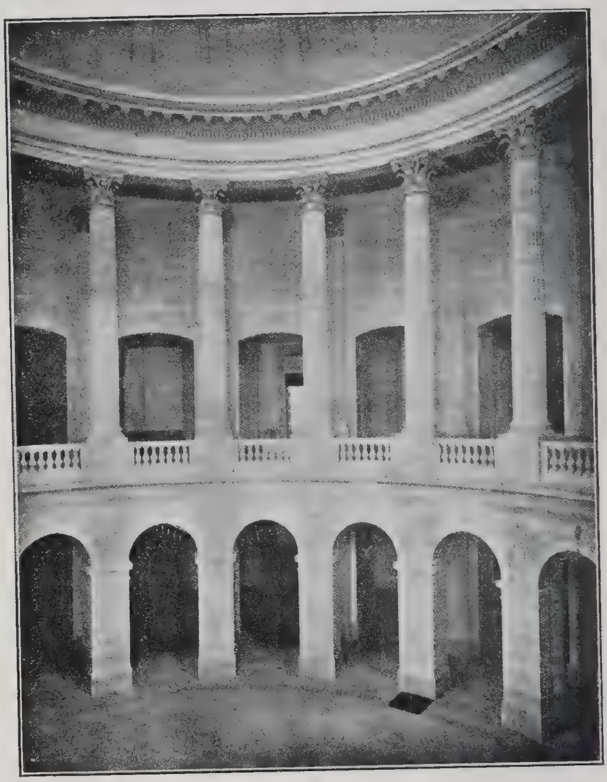


CORNER OF THE OFFICE BUILDING OF THE HOUSE, U.S. CAPITOL.
THOMAS HASTINGS, ARCHITECT.

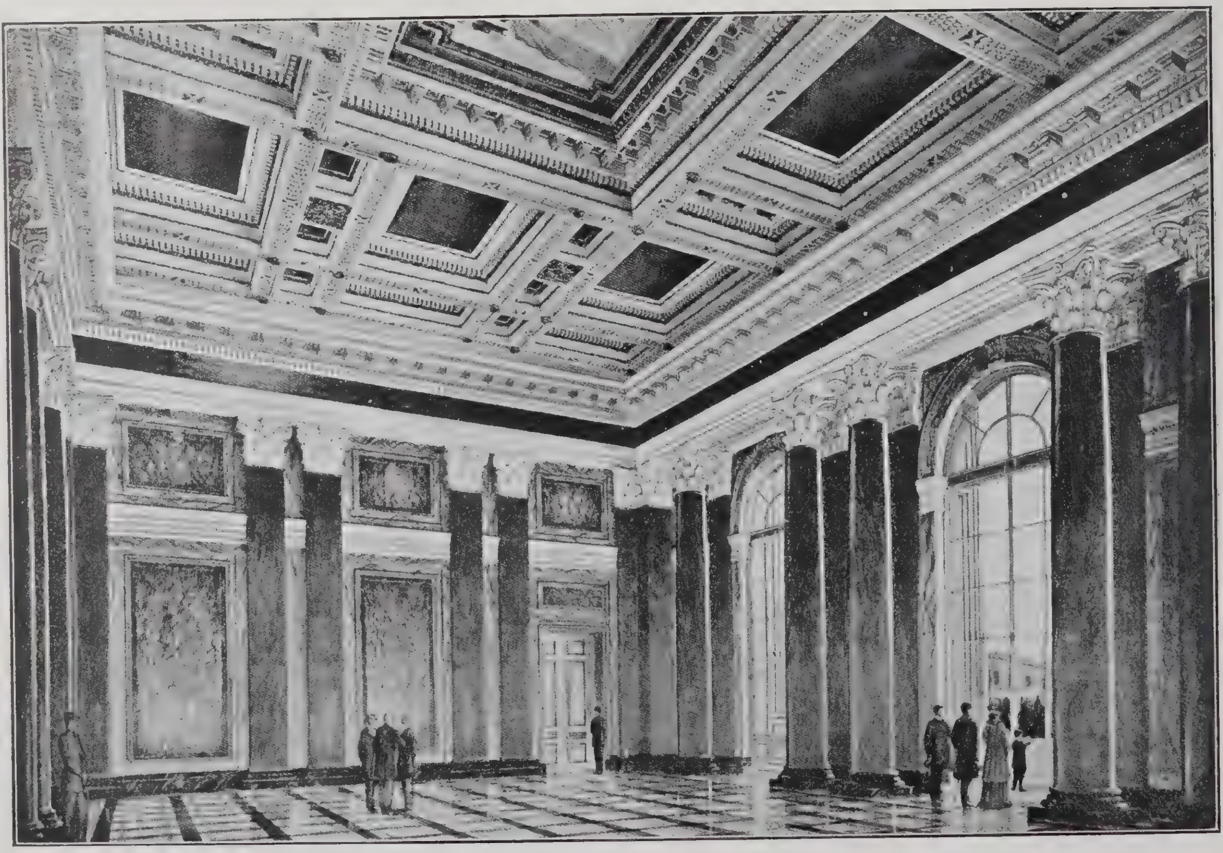
For Office Building of the Senators, see page 624.



CORNER OF THE SENATE OFFICE BUILDING.
JOHN M. CARRÈRE, ARCHITECT.



ROTUNDA, OFFICE BUILDINGS OF THE HOUSE AND SENATE.
CARRÈRE AND HASTINGS, ARCHITECTS.



WAITING-ROOM IN THE OFFICE BUILDING OF THE SENATORS. JOHN M, CARRÈRE, ARCHITECT.
Note.—Since this drawing was made the colour of the marble columns and frieze has been changed from green to white.

SOME COMPETITIONS OF 1909.

Award Announced.	Building.	Cost.	Assessor.	Successful Competitors.	Remarks.
January	Secondary School, Bury	—	J. W. Simpson	1st, T. Thomas Halliday; 2nd, Castle and Warren; 3rd, Appleyard and Quiggin.	
,,	Primitive Methodist Church and Schools, Gateshead.	£5,000	———	Marshall and Tweedy	Church to accommodate 600 school 350
,,	Elementary School (Elton Ward), Bury	—	J. W. Simpson	1st, Frank S. Biram; 2nd, G. E. Bolshaw; 3rd, France and Laycock.	23 designs submitted
,,	Palais de Justice, Toulon	—	———	1st (5,000 francs), M. Monestal; 2nd (3,000 francs) Georges Debrie; 3rd (1,500 francs) M. Roustan; 4th (500 francs), M. Gassier.	
,,	Public Shelter, Whitley Bay		———	(£20), Edward Cratney	
,,	Carnegie Library, New Mills	£2,000	———	1st (£15), R. B. Preston; 2nd (£10), Butterworth and Duncan; 3rd (£5), Potts, Sons, and Hennings.	
,,	Hallcroft Schools, Ilkeston	—	— Widdows	H. Tatham	
,,	Whittingham Asylum, Preston	—	———	1st, Sykes and Evans; 2nd, — Lodge; 3rd, Appleyard and Quiggin.	
February	Royal Infirmary, Bristol	—	Edwin T. Hall	1st, H. Percy Adams; 2nd, Henman and Cooper; 3rd, Worthington and Son.	
,,	Central Library, Blackpool	£12,500	G. H. Willoughby	1st, Cullen, Lochhead and Brown; 2nd, Russell and Cooper; Thompson and Bristow; Cooper and Slater; C. H. Potter; H. R. Gardner.	152 designs submitted
,,	Cornwall County Offices, Truro	—	G. H. Fellowes-Prynne	1st, Silcock and Reay; 2nd, Pearson and Milburn; 3rd, Warwick and Hall.	59 designs submitted
,,	Congregational Church, Palmer's Green	—	———	George Baines and Son	
March	Pearl Life Assurance Buildings, Leeds	—	Percy Monckton	William Bakewell	
,,	Footbridge over the River Wey, Guildford	—	———	1st, Clemence and Moon; 2nd, Davies and Swayne	75 designs submitted.
,,	Post Office, Pretoria, S.A.	—	A. Baker, W. F. Stucke, and W. Reid.	1st, A. J. Stewart; 2nd, Kraan and Wyers; 3rd, J. E. McKenzie.	
April	Holgate Grammar School, Barnsley	—	A. W. S. Cross and A. V. Houghton.	Crouch, Butler, and Savage	
,,	Bethel Independent Chapel, Penclawdd	—	———	W. Beddoe Rees	
May	Elementary Schools, Wombridge	—	———	Dickens-Lewis and Haymes	
,,	Rivelin Valley, Sheffield	—	Alderman Styring, William Terrey, Edward Holmes, E. M. Gibbs, and P. Marshall.	1st (£21), J. Creswick, Brameld and Son; 2nd (£10 10s.), James Miller.	Competition limited to architects practising with 30 miles of Sheffield. 11 designs submitted
,,	Secondary School, Shrewsbury	£16,000	Henry T. Hare	F. H. Shayler and J. A. Swan	Accommodation for 200 boys and 200 girls
,,	Public Library, Middlesbrough	—	J. S. Gibson	1st (£50), Russell and Cooper; 2nd (£30), G. H. Wenyon and Chas. H. Potter; 3rd (£20), Cooper and Slater.	202 designs submitted. Unsuccessful protest made by dissatisfied architects
,,	Congregational Church, Rhos-on-Sea	—	J. B. Gass	1st, J. M. Porter and Elcock; 2nd (£10), Arthur Hewitt	
June	National Library of Wales, Aberystwyth	£85,000	Reginald Blomfield	Sidney K. Greenslade	5 other architects awarded 30 guineas each
,,	Secondary School, Elland	£12,000	Vickers Edwards, and A V. Houghton	W. S. Braithwaite	
,,	Model Village, near Stafford	—	———	1st, Buckland and Haywood-Farmer; 2nd (£20), Geo. H. Wenyon.	
,,	School in Grove Street, Barnsley	—	H. T. Buckland	1st (£30), S. W. Dyson; 2nd (£20), Clarke and Moscrop; 3rd (£10) Holtom and Fox; 4th (no prize), A. Brocklehurst.	
July	United Methodist Church, Rochdale	—	———	1st, Butterworth and Duncan; 2nd, Ratcliffe and Chadwick; 3rd, — Thornley.	
,,	Public Library, Liscard	—	G. H. Willoughby	1st, R. B. McColl and G. E. Tonge; 2nd (bracketted), J. R. Earnshaw, Packer, Drewitt and Drewitt, Appleyard and Quiggin, Deacon and Horsburgh, Sproat and Warwick.	
August	East Cornwall Hospital, Bodmin	—	———	1st, Morley B. Collins; 2nd, F. A. Wiblin; 3rd, H. T. Bonner.	36 designs submitted
,,	Town Hall Extension, Stoke-on-Trent	£25,000	Leonard Stokes	1st (£200), Garratt and Simister; 2nd (£100), Warwick and Hall; 3rd (£50), W. Haywood.	
,,	Public Buildings, Burslem	—	Henry T. Hare	1st, Russell and Cooper; 2nd (£100), E. Montague Thomas; 3rd (£50), Warwick and Hall.	
September	County Council Offices, Berkshire, Reading	—	Mervyn Macartney	1st (£100), Warwick and Hall; 2nd (£75), E. J. Shrewsbury; 3rd (£50), Wills and Anderson.	
,,	Council Offices, Newburn	—	R. J. Leeson	1st, Edward Cratney; 2nd (£10), Marshall and Tweedy	
,,	Town Hall Extension, Grimsby	—	Sir Alfred Gelder	1st, Eade, Johns and Browne; 2nd, Withers and Meredith; 3rd, Rigby, Oliver and Phipps.	
,,	Secondary School, Whitby	—	Paul Waterhouse	1st, Thomson and Bristow; 2nd (£21), R. W. Owen; 3rd (£10 10s.), Oliver, Leeson, and Wood.	
October	Branch Library, Deptford	£4,500	J. S. Gibson	1st (£52 10s.), Castle and Warren; 2nd (£26 5s.), W. F. Young and H. W. Horsley; 3rd (£10 10s.), Wills and Anderson.	
,,	New Academy, Hamilton	£35,000	———	Cullen, Lochhead and Brown	
,,	School for Girls, Harrogate	£46,000	H. W. Chatters	W. Gilbee Scott	
,,	Training College, Hull	£33,350	John W. Simpson	1st (£150), Crouch, Butler, and Savage; 2nd (£100), W. H. Thorp; 3rd (£50), G. H. B. Gould.	
November	Isolation Hospital, Aberdare	—	Sir William Emerson, and Dr. W. Williams.	1st, E. C. H. Maidman; 2nd, Stockdale, Harrison and Sons, and H. H. Thomson; 3rd, E. Montague Thomas.	
,,	Parish Hall, Eltham	—	T. Lempriere Hesketh	Moscrop-Young and Glanfield, and Percy J. Waldram	63 designs submitted
,,	Grammar School, Preston	£12,000	F. W. Catterall	1st, Woolfall and Eccles; 2nd, Arthur Greenwood; 3rd, Packer, Drewitt, and Drewitt.	179 designs submitted
,,	Secondary Schools, Wellington	£9,000	H. Beswick	Shayler, Swan, and Ridge	Accommodation provided for 125 boys and 125 girls
December	Club House, St. Anne's-on-Sea	Between £4,000 and £5,000	Ernest Newton	Walter Stirrup and Cooper and Slater	

REPORTS AND PERSONALIA OF THE YEAR.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

Incidentally remarkable for an almost unprecedented dearth of work among the members of the architectural profession, the year now rapidly drawing to its close may yet be regarded, albeit from an entirely different point of view, as one of an epoch-marking nature.

For whilst we recognise and deplore the protracted existence of the unfortunate commercial depression from which, in common with other classes of the community, the members of a poorly paid and onerous calling are undoubtedly suffering, yet a brief review of the work accomplished during the past twelve months by the governing body of the premier architectural society reveals a condition of affairs by no means unsatisfactory to the many members of the R.I.B.A., who have the larger interests of the entire profession at heart.

Indeed, although in doing so we may be considered unduly optimistic, we venture to point out that, at the ancient stronghold of architectural conservatism, No. 9, Conduit Street, there are now unmistakable signs and portents of the advent of a long-desired change of policy under which the old order of things may, ultimately, reasonably be expected to give place to the new.

To particularise, during the ensuing year the doors of the R.I.B.A. will be opened, to their fullest extent, for the admission of the new class of members known as Licentiates. It is intended that Licentiate members of the R.I.B.A. should be either (a) architects in actual practice who are at present unable to join the Institute as Fellows, or (b) properly qualified architects' assistants.

Whether the attempt to induce outside architects to assist in closing the ranks of the profession and extending the Institute's sphere of influence meet with a favourable or an unfaourable reception from those to whom the invitation is extended, the creation of an additional class undoubtedly marks a departure from the policy which has hitherto found favour at the R.I.B.A.

We can, therefore, at least, congratulate the governing body upon a praiseworthy effort to increase the prestige and usefulness of the Institute, and trust that the innovation proposed will prove to be merely the first of many changes which must, necessarily, be associated with the adoption of a broader and more liberal-minded policy.

Another sign of the times has reference to the appointment of a committee to deal with that most difficult problem, the preparation of a Parliamentary Bill.

The constitution of this Bill, if drafted, as it should be, to meet not only the present but the future requirements of the whole profession should excite the greatest interest among members of the architectural profession, all of whom, whether already associated with the R.I.B.A. or outside that body, will eagerly await the result of the committee's deliberations and the subsequent publication of its report.

During the past year the regulations issued by the Institute for the conduct of architectural competitions have been revised by the Competitions Committee and, in all essential respects, the latter's proposals have been accepted by the Council.

Although not yet perfect, these regulations, as recently amended, are a vast improvement upon the vague "suggestions" issued by the Council of the Institute a few years ago, and promoters about to arrange the conditions of their competitions would do well to adopt one or another of the very excellent methods of procedure indicated in this official document which, presumably, will shortly be ready for general use.

Our readers will be glad to learn that at length, after, as it appears to us, many years of altogether unnecessary procrastination, the inconsistencies apparent in the oft-adversely criticised schedule of professional charges is now engagaing the attention of the governing body of the Institute and a committee will shortly be appointed to revise and amend it—or, better still, re-draft it *in toto*.

This instance of the Council's rather unexpected departure from its old-time policy of *laissez-faire* strengthens our belief that the Institute is, at last, becoming aware that its erstwhile rather somnolent attitude towards matters architectural is neither conducive "to the general advancement of civil architecture," nor is it calculated to assist, to the fullest extent possible, "in promoting and facilitating the acquirement of the various arts and sciences connected therewith."

We have so often drawn attention in this journal to the flagrant errors and contradictions which occur in the R.I.B.A.'s amazing schedule of professional charges that it would be superfluous to repeat them here. It is sufficient to say that many practitioners know to their cost, how little weight and authority the document carries with it in a court of law or *(horresco referens!)* even among architects themselves.

An earnest endeavour should be made to ensure that the scale of charges as laid down in the amended (or new) schedule should be one of a nature likely to be regarded as authoritative in actions at law, in addition to being accepted and adhered to by all architects of repute.

The question of the architect's remuneration has recently been under consideration in America and a new scale of charges has been devised by our trans-Atlantic brethren, which (*inter alia*) provides for the payment of professional consultant specialists, who may be employed to advise an architect in such matters as constructional steelwork, heating and ventilation, electrical installations, etc. Now as these are subjects upon which, owing to the imperfect nature of their scientific training, the majority of architects of to-day are anything but well informed, the cost of any extraneous professional assistance should be carefully considered by the committee appointed to deal with the important question of architects' charges.

MR. IAN MACALISTER, B.A., OXON.
Secretary of the Royal Institute of British Architects.

The proposal to establish a British School of Architecture in Rome, concurrently with the institution of a diploma course of architectural training, is still engaging the attention of those to whom it has been referred. In itself the suggestion is a highly meritorious one which deserves to receive a liberal measure of support, but the broad fact remains that it is, necessarily, very limited in its scope as it is of course intended to benefit only a few exceptionally brilliant students. But the problem of the education of the architect of the future is one of paramount importance which the establishment of a School of Architecture is Rome or elsewhere on the extremely restricted scale proposed, would do little or nothing to solve.

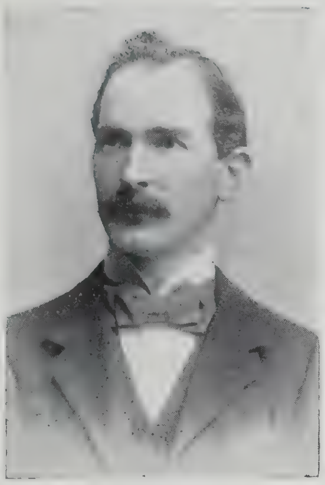
What is wanted for the training of the average student is a central school, or schools, of architecture conducted by architects in actual practice who are fully in sympathy with the principles underlying a thoroughly definite course of artistic and scientific training, such for instance as that to be obtained at the *Ecole de Beaux Arts* in Paris.

That it would be difficult to find suitable and sympathetic instructors among the architects of this country goes without saying, but it is more than probable that a sufficient number of suitable men would be forthcoming if the scheme were to assume concrete form. But if an educational scheme, on these lines, were adopted, a severe test examination, in lieu of the present ridiculous preliminary examination of the R.I.B.A. would have to be instituted with the object of inducing men of culture and good general education to seek entrance to the profession. In short, in our view, the architectural education of the majority of students should be carefully provided for and safeguarded before any attempt is made to supply a kind of post-graduate course for the exceptionally clever minority.

PRESENTATION OF THE ROYAL GOLD MEDAL.

At the presentation to Dr. Evans, Mr. George said: While most of us are occupied with our personal aims and interests, seeking our own profit or advancement, with some consideration for the greatness of our art and, perhaps, equal consideration for the necessary daily bread, there is among us a small band of workers moving on a higher plane, men who have set themselves to increase the sum of human knowledge. Some of these are engrossed in science, discovering ameliorations to sickness and pain. Some are exploring the desert and the mountain and charting unknown regions and increasing man's resources; while other brave men face the hardships of ice, storm, and starvation and fight their way to the Poles. All these explorers we delight to honour.

But to us the poles have no professional attraction: we shall not be called upon to house the surplus population and the unemployed in those regions. The inhabited world and a knowledge of past civilisations



Mr. James Glen Sivewright Gibson,

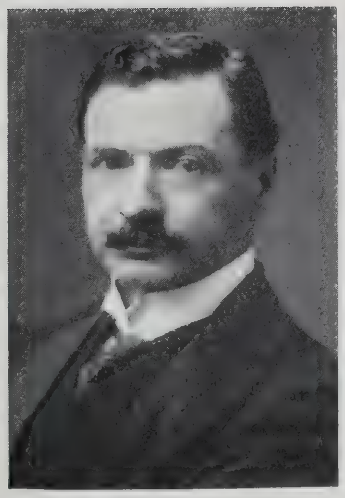
Vice-President.

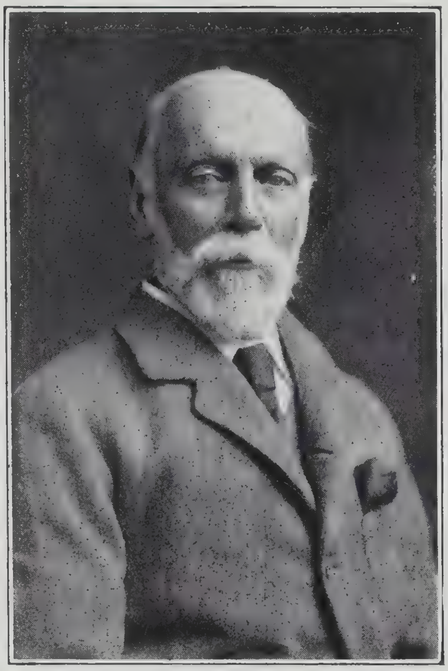
Born in Arbroath, Forfarshire. Came to London and entered the office of Mr. Wallace. There met Mr. S. B. Russell, whom he later joined in a long and famous partnership, since dissolved. Mr. Gibson's practice has been mainly in public buildings, and the firm of Gibson and Russell became famous in the annals of competitions. Among Mr. Gibson's recent works is Caxton House, Westminster.

Mr. Alfred William Stephens Cross,

Vice-President.

Mr. Cross received his general education at King's College, London, and at Gonville and Caius College, Cambridge, where he took his M.A. degree. Articled to his father, a well-known architect of Hastings and London, Mr. Cross has practised in the Metropolis for the past 20 years, during which he has designed and superintended the erection of numerous London and provincial public buildings, including the School of Technology, Manchester.



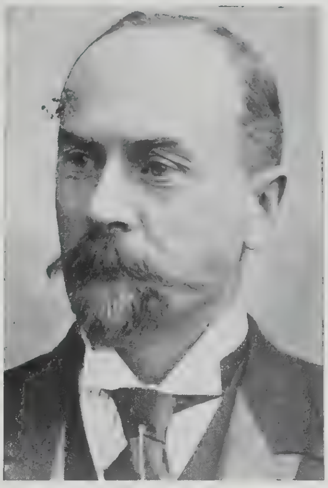


Mr. Ernest George.

President.

Born London, June 13th, 1830. Educated Brighton, Reading, R.A. gold medal of the Royal Institute of British Architects, 1896. Articled to S. Hewitt; entered Royal Academy as student; began practice with T. Vaughan; at Vaughan's death was joined by Harold Peto, and on Peto's retirement, by A. B. Yeates. Professional work: Steadleigh Court, Devon; Rousdon, Devon; Metcombe, Dorset; Batsford, Gloucester; Edgeworth Manor, Gloucester; Monk Fryston. Yorks; Poles, Herts.; North Mymms, Herts.; Buchan Hill, Sussex; Dunley Hill, Surrey; Welbeck Abbey; Eynsham Hall, Oxon.; Sedgwick Park, Sussex; Ruckley Grange, Salop; Busbridge Park, Surrey; Crathorne Hall, Yorks; Shiplake Court; Harrington Gardens; Mount Street; Collingham Gardens, S. Kensington; houses in Cadogan Square and Berkeley Square; Albemarle Hotel and Ossington, Newark; Church of St. Andrew, Streatham; St. Pancras, Rousden, Devon; the churches of Samaden and Taraso, in the Engadine; villa at Antibes, France. Publications: as an etcher—"Etchings on the Mosel," "Etchings on the Loire"; in Belgium; in Venice.

Photographs :—Mr. Ernest George, by Russell & Sons, London. Mr. J. S. Gibson by Powden & Son, Dundee. Mr. A. W. S. Cross by J. Caswall Smith, London and Mr. E. Guy Dawber by Lyd Sawyer, London.



Prof. Reginald Theodore Blomfield,

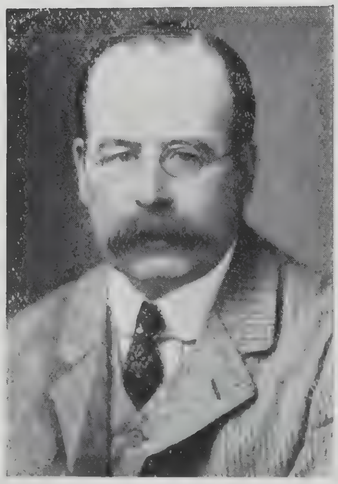
Vice-President.

Is the third son of the late Rev. G. J. Blomfield, M.A. Educated at Haileybury, gained an exhibition scholarship to Exeter College, Oxford, 2nd in Mods., 1st in Greats 1879; M.A., a Hon. Fellow, Exeter College, A.R.A., 1904. Fellow Society Antiquaries Fuller particulars of Mr. Blomfield's work are given in the article on page 517 of this issue.

Mr. Edward Guy Dawber,

Vice-President.

Born in King's Lynn, Norfolk, and was articled in that town. After expiration of articles went as an assistant in the office of Sir Thomas Deane, in Dublin, and from there as an assistant to Messrs. Ernest George and Peto. Studied at the R.A. Schools, gained lower school premium for design 1895, and upper school ditto 1896. Commenced private practice in Glostershire in 1890; moved to London 1891; was president of the A.A. in 1904-1906.



have for us a much deeper interest, and we owe a great debt to those keen sportsmen who have set themselves to discover the relics of past races, unearthing buried cities, their temples and palaces, deciphering records and showing us how men have lived and fought and built.

To such work our distinguished visitor, Dr. Arthur Evans, has devoted his mind, his time, and his means, with the splendid result of reclaiming from oblivion the long-hidden treasures of Crete.

It is our privilege periodically to recommend for his Majesty's approval a name for the distinction of the Royal Gold Medal. It is for one who by building, by writing, or by research has advanced the Art of Architecture. The first explorer to receive this mark of appreciation was the great pioneer of excavation, Sir Henry Layard, whose winged bulls, so prominent a feature in the British Museum, may be found some day to have relation to the Bulls of Knossos which Dr. Evans describes.

It is my pleasant duty to-day, in your names, to present the King's Gold Medal to Dr. Arthur Evans, who, in discovering the Palace of Minos, has, it is no exaggeration to say, completely revolutionised our accepted ideas of the early civilisations surrounding the Mediterranean basin. He has converted myth into history and floating prehistoric tradition into established fact.

But what is of paramount interest to us, he has shown that centuries before the Parthenon was thought of, indeed, before the Greek nation came into being, there were architects at Knossos and in other parts of Crete building huge monuments and palaces showing consummate skill in construction and adaptation for the use of man in an advanced state of culture. In fact, Crete has been found actually to have played the part in ancient civilisation which tradition had claimed for it. With Dr. Evans among us to-night it is not for me to tell you of Crete. I will only ask him now to accept the medal as a tribute of our high esteem.

THE ARCHITECTURAL ASSOCIATION.

As the president, Mr. Henry Tanner, F.R.I.B.A., remarked in the course of his address, delivered at the annual general meeting on October 8th, the association has no doubt felt, in various ways, the effects of the general depression. Consequently there have been an abnormal number of cases of lapsed membership, and the publications of the association have not been adequately supported, and it may or may not be from the same cause that the excellent A.A. play was not successful from the financial point of view, although artistically it left but little to be desired. The work of the association neverthless goes on with undiminished vigour, nor is the lighter side neglected. The School of Architecture, with its energetic committee and its powerful advisory Council, and its accomplished master (Mr. H. P. G. Maule, F.R.I.B.A.) and efficient staff, is flourishing exceedingly, both in its day and in its evening departments, and is doing splendid educational work, furnishing as complete an equipment for the architect as has been yet organised. Stimulus in the form of prizes and scholarships is liberally provided. The recreative side is being judiciously extended, and it is proposed to hold "At Homes" modelled on those held by the R.I.B.A., and to start a golf club. The membership at the termination of the sixty-second session, which terminated at the end of last May, was 1,685. Eighty-two members were elected, six re-joined, and the losses by resignation from other causes amounted to 111. President, Henry Tanner, F.R.I.B.A.; vice-presidents, F. Dare Clapham, F.R.I.B.A., and C. Wontner Smith, A.R.I.B.A.; secretary, D. G. Driver, F.C.I.S., 18, Tufton Street, Westminster.

From the Painting by Sir William Richmond, R.A. *Photo: F. Hollyer.*

DR. ARTHUR J. EVANS, ROYAL GOLD MEDALLIST, R.I.B.A., 1909.

Dr. Evans is well known among Architects for his explorations in the Island of Crete, during which he has partly unearthed the buried palace of Minos.

THE SOCIETY OF ARCHITECTS

The chief items of general interest in the work of the Society during the past year are as follows:—

The addition of 104 members and students, resulting in raising the total membership to one thousand, after allowing for deaths and resignations.

Early in the session the Society, by means of a donation of £50, enabled its South African Branch to co-operate with the Transvaal Institute of Architects in promoting a Registration Bill, with the result that a Bill for the Registration of Architects in the Transvaal become law on July 7th, 1909.

The Society's membership certificate is now accepted by the Transvaal Government as a qualification for registration under the Act.

A feature of the year's work has been the growth and development of the students' section and the organising of a successful series of sketching parties and visits to works.

The travelling studentship and other design competitions resulted in good entries, and some excellent work, which was exhibited in London, Cardiff, and Birmingham.

A new departure was a students' exhibition of sketches and distribution of prizes at St. Bride's Institute on November 8th, when a very useful and pleasant evening was spent.

The social functions organised by the Society were very successful, particularly the twenty-fifth annual dinner at the Trocadero, which was attended by upwards of 200 members and their friends.

One of the most important of the Council's undertakings was the completion of the negotiations for new premises by their entering into an agreement for a lease of 28, Bedford Square, which is being adapted to suit the needs of the Society. It is expected that the new premises will be ready for occupation at

The Society is co-operating with the R.I.B.A. in regard to the proper conduct of architectural competitions and other matters affecting the interests of the profession.

The Society has sustained a great loss by the retirement of Mr. Ellis Marsland from the position of Hon. Secretary, which he has held with so much advantage to the Society for over 17 years. His services are to be recognised by the presentation of the gold medal of the Society.

A gratifying feature of the year's work is the satisfactory condition of the finances, there being a surplus of assets over liabilities of £1,775, the excess of income over expenditure for the year being £261.

THE QUANTITY SURVEYORS' ASSOCIATION.

The first of the pamphlets on "Uniformity of Custom" has, as foreshadowed in our report of the association's operations in 1908, been issued to the members. This document which embodies the Council's recommendations respecting the measurement of the

Mr. Frederick Dare Clapham,

Vice-President.

Mr. Clapham, with Mr. G. B. Carvill, has been the mainstay of the A.A. play for many years past. He is a partner in the firm of Mountford and Clapham, Architects of the London Sessions House, etc., and is an F.R.I.B.A.

Mr. Maurice Everett Webb,

Hon. Secretary.

Mr. M. E. Webb is the son of Sir Aston Webb, R.A., and was articled to his father, following a University training, in which he took his M.A. degree. Mr. Webb has been one of the Editors of that merry little publication, "The Purple Patch."

Mr. Edwin Gunn,

Hon. Secretary.

Born in London 1878, and educated privately; pupil of Mr. Alfred Frampton; joined A.A. 1899; A.A. Scholarship 1900-1; Medal Advanced Class of Design 1901-2; Associate 1904; Librarian 1906-7; Editor A.A. Journal 1908; Jun. Hon. Sec. 1909; Member of Practice Standing Committee R.I.B.A.

Mr. Cyril Wontner Smith,

Vice-President

Was articled to Mr. A. Morice Butler, of London, formerly in partnership with Mr. Arnold Mitchell; served 3 years. Afterwards went into Mr. Mitchell's office, in the offices of Sir Aston Webb, W. D. Caröe, Sir A. Blomfield and Sons. Was awarded medals of merit at the Institute for measured drawings in 1896 and 1898. Won the Pugin Studentship, 1902; and in 1903 medal of merit in the Soane Medallist. Elected Assoc. R.I.B.A., 1900. Commenced practice 1903.

Mr. Henry Tanner,

President.

Mr. Tanner is the son of Sir Henry Tanner, I.S.O., the Chief Architect to H.M. Office of Works, was born in 1876, educated at the Merchant Taylors' School, and matriculated at London University. Mr. Tanner was articled to his father, and afterwards entered the office of Sir Aston Webb, R.A. He also studied at the Royal Academy Schools, where he won the travelling studentship in 1900. He was elected an Associate of the R.I.B.A. in 1899, and a Fellow in 1907. The President has been connected with the A.A. since 1896, and in 1903 was appointed hon. secretary, a post he occupied for four years; for the last two sessions he has been a vice-president.

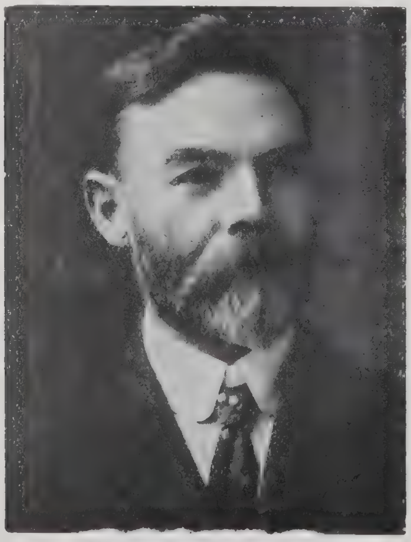
Photographs: — Mr. Tanner, by the Stereoscopic Co. Mr. Clapham, by Langford, Ltd.; Mr. Wontner Smith, by Histed & Co. Mr. Maurice E. Webb, by Russell & Sons.

Slater's and Tiler's work, has met with general approval, not only among the members of the association, but also amongst various associations of slate merchants and master slaters, to whom the want of an authoritative system of measurement has been apparent for some years.

The Council has been asked to take some action in order to mitigate the evil caused by the increasing tendency on the part of public authorities and private employers to invite tenders from contractors without providing bills of quantities, the competing firms being each supplied with reproductions of the drawings and copies of the specification from which they can either prepare their own quantities, or submit tenders based upon the cubic contents. A specification written before the quantities have been "taken-off" is generally incomplete and lacking in several essential details, therefore in the absence of a properly prepared bill of quantities it is frequently difficult to decide what is, and what is not, embodied in a tender submitted by a contractor who adopts one of the methods to which we refer. Again in dealing with the accounts for work on which considerable variations from the original drawings have been made, it is well nigh impossible to do justice to either the employer or the builder, in cases where quantities, or any satisfactory basis on which variations can be adjusted, are not provided. The Council recognising that for these reasons, estimating, under these conditions is not in the best interests of the employer and (inasmuch as an unjust burden of additional expense is placed upon them through their being compelled to employ quantity surveyors themselves) it is obviously unfair to the builders, is doing all in its power to secure a discontinuance of the system. A conference convened by the President was held in October last, at which representatives of various societies of builders throughout the country were present, a resolution was passed urging the members of these societies to refuse to tender in competition without quantities for works costing £500 and upwards, representations have been made to the Council of the R.I.B.A., and it is hoped that by these means the evil will be modified, and the practice eventually cease.

ABERDEEN SOCIETY OF ARCHITECTS.

Representatives of the Council of the society and of the Aberdeen Master House Carpenters' Association met, at the request of the latter body, to consider and discuss various alterations proposed by the association to the mode of measurement in the model schedule. These alterations, which were for the most part of minor importance, were gone over and discussed in detail, and several of them adopted. A copy of the schedule, as revised, has since been sent to each member of the society.



MR. G. E. BOND, J.P.
President of the Society of Architects.

Photo: Whiteleys.
MR. D. G. DRIVER,
Secretary of the Architectural Association.

Several cases of builders carrying on architects' work have been dealt with by the Council, the majority of which have been settled in a satisfactory manner by the parties involved giving an undertaking to desist from the practice.

A conference with Aberdeen Master Painters' Association has been held on the question of architects specifying in schedules the name of only one manufacturer of materials, which custom had been objected to by the National Federation of Master Painters. The deputation pointed out the hardship which, in certain cases, resulted to contractors from this practice, which, however, they admitted was not so prevalent in Aberdeen as in some towns in the south. After some discussion on the subject, the deputation thanked the Council for having heard their statement, and left the matter in their hands, hoping that it would receive attention.

Two scholarships, value £2 10s. each, are awarded for measured drawings. Last year a committee was appointed to draw up a scheme for instituting further competitions among architects' pupils and apprentices in Aberdeen, for prizes to be presented by the society. This committee having met and considered the matter, reported that they were of opinion that the society should offer two prizes of £2 and £1 respectively for competition among students in the first two years of their apprenticeship, the subject for competition being selected mainly with a view to promoting efficiency in draughtsmanship; also two prizes of similar amount for competition among students in the third, fourth, and fifth years of apprenticeship, the subject selected being such as to ensure that design, as well as drawing, should be an element in the competition.

The Council is again co-operating with the Council of the Aberdeen Architectural Association in promoting a series of lectures to students during the winter session, from architects of standing, on subjects of architectural interest.

Last year there were no additions to the membership of the society, which remained at 23, President, Mr. Arthur Clyne; hon. sec., Mr. A. H. L. Mackinnon, 245, Union Street.

ALBERTA (CANADA) ASSOCIATION OF ARCHITECTS.

This association is in its third session, and has this year issued its first year book, a very businesslike publication, giving the text of the association's Act of incorporation, the association by-laws, a list of registered architects and students, and a report of the third annual meeting. From the text of the Act it appears that after the expiration of six months from the publication of the notice of the organisation of the Council of the said association, no person can take or make use of the name or title of architect, either singly or in connection with any other word, name, title or designation, giving it to be understood that he is an architect under this Act, unless he is registered under this Act as a member of the said association. Any person who, after the time above mentioned, not being registered as a member of the said association, takes or makes use of any such name, title or designation, as above mentioned, shall be liable upon summary conviction, to a fine not exceeding twenty-five dollars for the first offence, and not exceeding one hundred dollars for every subsequent offence. The regulations for architectural competitions are fairly definite as to the duties of assessors, giving five conditions under which a design should be ruled out. The president of the association is Mr. R. Percy Barnes, Edmonton; honorary president, Mr. James E. Wize, Edmonton; hon. sec., Mr. H. M. Whiddington, Strathcona. The headquarters of the association are in the new Windsor Block, Jasper Avenue, Edmonton. The registered architects and students in 1908 numbered about forty.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.

The session 1908-09 will always be memorable in the history of this association on account of the foundation of the Birmingham School of Architecture. Some two years ago the general dissatisfaction which was felt in the local educational facilities culminated in the appointment of a committee to enquire into the whole position of architectural education in Birmingham. The members of this committee have had before them at their numerous meetings reports from the Board of Architectural Education, and the various universities and schools where new architectural courses have been established; they have also had conferences with Birmingham University and the Municipal School of Art. The labours of the committee have resulted this session in a report to the Council, in which it was recommended to establish a day school. A large number of prominent architects in the city having consented to accept pupils at a reduced premium, on condition that they passed through such a school, the School of Art Committee of the City Council arranged to start an architectural day school at the School of Art in place of some of the evening classes. The Council are particularly pleased that they have persuaded their past president, Mr. J. L. Ball, to undertake the

Photo: Dover Street Studios.
MR. C. McARTHUR BUTLER.
Secretary of the Society of Architects.

Photo: H. T. Reed.

MR. H. T. A. CHIDGEY.
President of the Quantity Surveyors' Association.

directorship of this school at its commencement. This session was also notable on account of the inauguration of the new rooms in the Exchange Buildings, which have proved to be well suited to the requirements of the association meetings. The general meetings have more than maintained the interest of those of past years, but it is to be regretted that the attendance did not fulfil the hopes expressed in the previous report. The inaugural meeting at the Midland Hotel was of great interest on account of the fine exhibition of drawings of recent work, lent by members and many of the best-known London architects. An enjoyable excursion to Paris at Whitsuntide is chronicled. President, Mr. A. S. Dixon, M.A., F.R.I.B.A.; hon. secs., Mr. G. Salway Nicol, A.R.I.B.A., 117, Colmore Row, and H. W. Simister, Norwich Union Chambers, Congreve Street: secretary, E. Marston Rudland, C.A., 14, Temple Street.

BRISTOL SOCIETY OF ARCHITECTS.

This society, whose address is Fine Arts Academy, Queen's Road, Clifton, was established in 1850, and reorganised in 1888. It has Bristol for its centre, and Gloucestershire, Somerset, Wiltshire, and Dorset for its province. During the present year the following lectures have been given: "Recent Explorations of the Roman Forum," by Mr. St. Clair Baddeley; "English and Italian Garden Architecture," by Mr. T. H. Mawson. The ordinary meetings are held at 8 p.m. in the society's room at the Fine Arts Academy, generally on the second Monday in each month. The president is Mr. Mowbray A. Green, F.R.I.B.A., hon. sec. and treasurer, Mr. T. H. Weston, F.R.I.B.A.

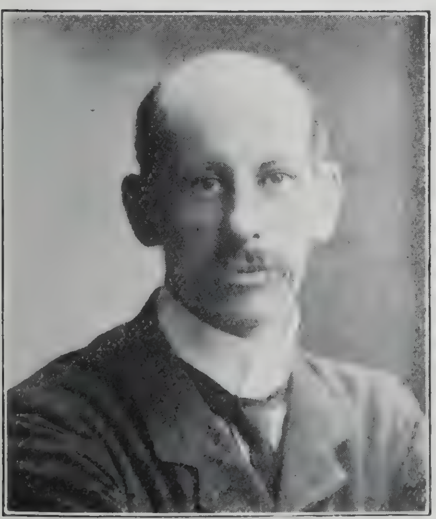


Photo: Lambert.

MR. MOWBRAY A. GREEN, F.R.I.B.A.
President of the Bristol Society of Architects.

THE ROYAL ARCHITECTURAL INSTITUTE OF CANADA.

The Royal Architectural Institute of Canada was founded as the Institute of Architects of Canada, 19th August, 1907, was incorporated by special Act of the Dominion Parliament, 16th June, 1908 (7-8, Edward VII., Chap. 82), under the corporate name of "The Architectural Institute of Canada," was granted Royal permission to adopt the prefix "Royal" to its corporate name, 2nd June, 1909.

The objects of the Royal Institute, as set forth in its Charter, are "to facilitate the acquirement and interchange of professional knowledge among its members, and more particularly to promote the acquisition of that species of knowledge which has special reference to the profession of architecture, and further to encourage investigation in connection with all branches and departments of knowledge connected with that profession."

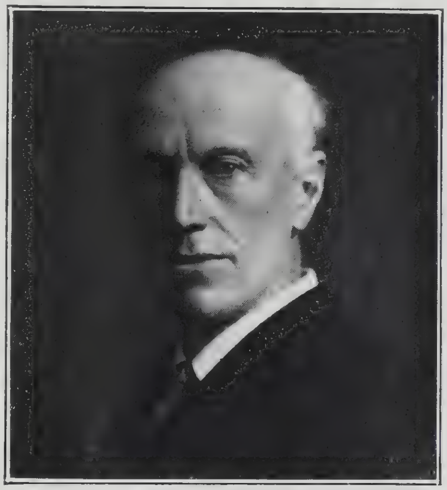


Photo: F. Hardie.

MR ARTHUR CLYNE, F.R.I.B.A.
President of the Aberdeen Society of Architects.

There are four classes of members, viz.: (1) Honorary Members, who are persons eminent in architecture or kindred sciences; (2) Honorary Corresponding Members, persons not residing in Canada, eminent as architects, or archeologists, or in art, science, or literature, who may render assistance in promoting the objects of the Royal Institute; (3) Fellows, who have practised as architects for at least ten years; (4) Associates, architects having practised architecture for at least two years.

A code of ethics, schedule of usual and proper minimum charges, regulations for architectural competitions and by-laws were adopted in the General Annual Assembly of the Royal Institute on the 29th September, 1908, held in Ottawa, Ontario. The General Annual Assembly is held in September or October.

The Royal Architectural Institute of Canada is in alliance with The Royal Institute of British Architects, and is the accredited representative of the Dominion of Canada in its relations with The Royal Institute of British Architects.

During year 1909 The Royal Institute have on its records the following to its credit:—The Right Hon. The Earl Grey, G.C.M.G., Governor General of the Dominion of Canada, has graciously consented to become the Patron of the Institute. His Majesty the King gives permission to adopt the prefix "Royal" to the title of the Institute. The alliance with the Royal Institute of British Architects. The President, Mr. A. F. Dunlop, R.C.A., is elected a Corresponding Member of the Société des Architectes Diplômés par le Governement, France. The Hon. Secretary, Mr. Alcide Chaussé, M.S.A., M.R.S.A., is elected Honorary Corresponding Member of the Sociedade dos Architectos Portuguezes (Lisbon). The membership of the Royal Institute is composed of 24 Honorary Members, 18 Honorary Corresponding Members, 125 Fellows, and 70 Associates. total, 237 members. A project of affiliation of all the Canadian architectural organisations has been prepared, and is now under consideration. The publications of the Royal Institute are (a) The Year Book, issued annually; (b) the Book of Proceedings of the General Annual Asssembly, and (c) The Quarterly Bulletin. The Officers and Council elected at the last General Annual Assembly held in Toronto, on 5th and 6th October, 1909, are as follows:—President, A. F. Dunlop, R.C.A.; Vice-presidents, Edmund Burke, J. Z. Resther and Sam. Hooper; Hon. Secretary, Alcide Chausse, M.S.A., M.R.S.A.,; Hon. Treasurer, J. W. H. Watts, R.C.A.; Council, Wm. H. Archer, F. S.

Photo: Alfred Ellis.

MR. A. G. CROSS.
Secretary of the Quantity Surveyors' Association.

Photo: H. J. B. Wills.

MR. EDGAR J. C. DOWN, A.R.I.B.A.
President of the Cardiff, South Wales, and Monmouthshire Architects' Society.

Baker, F.R.I.B.A.; C. B. Chappell, Theo. Daoust, David Ewart, I.S.O.; G. E. Fairweather, H. E. Gates, H. B. Gordon, E. L. Horwood, J. P. Hynes, R. P. LeMay, G. A. Monette, S. F. Peters, and Jas. E. Wize. The third General Annual Assembly will be held at Winnipeg, Manitoba, in September, 1910.

CARDIFF, SOUTH WALES, AND MONMOUTH ARCHITECTS' SOCIETY.

The membership of the above society for the year ending Dec. 31st, 1909, comprises 35 members, and 11 associates.

Various meeting have been held during the year, and action taken in several matters of interest to the profession, both locally and generally. Several outings have been arranged, and very interesting visits have been paid to the Cardiff new Intermediate School for Boys, where the floors were being constructed on the Coignet system of ferro-concrete, also to the new University College buildings situate in Cathay's Park, and to the Corsham Bath Stone Quarries, belonging to the Zockney and Hartsham Park Stone Co., Ltd., also to Wraxhall Manor, at all of which very interesting features of professional importance were duly pointed out and noted.

Local, preliminary, and intermediate examinations for the Royal Institute of British Architects were held in Cardiff, being conducted by the Society; also examinations in connection with the Society of Architects, which latter Society have arranged for their examinations to be held in Cardiff annually. Exhibitions of drawings from the R.I.B.A. and the Society of Architects have been held, great interest being manifested by the visitors to them.

MR. JOHN T. MACLAREN.
President of the Dundee Institute of Architects.

DEVON AND EXETER ARCHITECTURAL SOCIETY.

This society was founded in the year 1887, and became allied to the Royal Institute of British Architects in the year 1891. The society consists of three classes, members, associate members, and associates; of about 90 members, embracing the counties of Devon and Cornwall, with Exeter as its centre.

The president for the present year is Mr. Wm H. May, M.S.A., of Plymouth, the vice-president, Mr. Charles Cole, M.S.A., of Exeter; the hon. treasurer, Mr. S. Dobell, of Exeter, and the hon. secretary, Mr. Allan J. Pinn, A.R.I.B.A., of Exeter; these officers, with a Council of eight members, form the governing body.

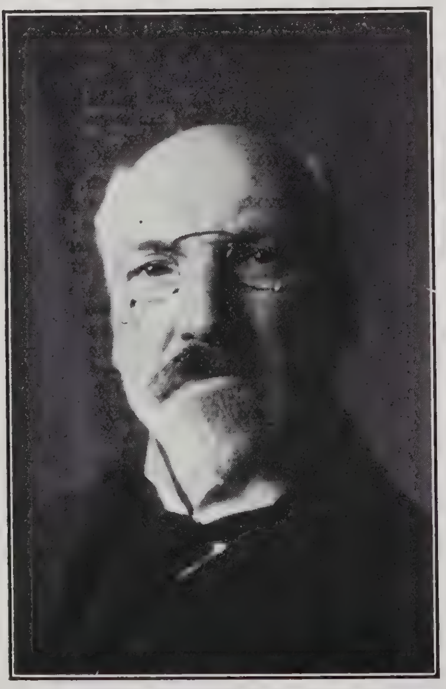
The work of the year includes a paper from Mr. James Jerman, F.R.I.B.A., of Exeter, on, "Some old Masters of Architecture and their Books," and also many matters of professional importance have been under discussion, and dealt with at various times amongst them being the further consideration and revision of the rules of the society, also a sub-committee consisting of Messrs. John M. Pinn, James Crocker, and Charles Cole, have devoted a great deal of time and trouble on the proposed revised building by-laws for the City of Exeter, which has been under consideration for some considerable time, and have had many interviews with the city surveyor on the matter.

Photo: *Albert P. Steer.*

MR. W. H. MAY.
President of the Devon and Exeter Architectural Society.

DUNDEE INSTITUTE OF ARCHITECTS.

The membership of the Institute, which was founded in 1884, and whose address is 104, Nethergate, is being steadily maintained. During the session dealt with in the report last issued, many points which have special bearing on the advancement of architecture, and on the interests of the profession in this district were brought forward. Considerable discussion and enquiry was made into the proposals for the revision of the rules of measurement, which are in use in this district. These rules—known under the short title of the "Dundee Mode of Measurement, 1898"—were adjusted in that year between the Dundee Institute of Architecture, the Dundee Master Builders' Association, and the Building Trades of the City of Dundee and vicinity. While the Council are unanimously of the opinion that many points have emerged which might with advantage be amended in the interests of all, they have felt that the present rules may suit until a fitting opportunity occurs to deal with these as a whole. The Town-Planning Bill was also very fully discussed in all its bearings as affecting the profession. Mr. John T. Maclaren is president, and Mr. William Salmond hon. sec., 6, High Street, Dundee.



MR. JOHN WATSON, F.R.I.B.A.,
President of the Edinburgh Architectural Association.

THE EDINBURGH ARCHITECTURAL ASSOCIATION.

A series of lectures during the winter season and visits in the spring and summer seasons was carried out as usual. Mr. John Watson, F.R.I.B.A., president, gave the opening address of the session, his subject being the "Architectural History of Holyrood Abbey Church." Other lectures were "Reims Cathedral," by Professor Gourlay, of Glasgow; "A Goodly Heritage," by Mr. Paul Waterhouse, London; Norfolk Church Rood Screens, by Mr. Wm. Davidson; and "Useful Hints on Gardening," by Mr. James B. Dunn, F.R.I.B.A., vice-president.

Photo: *Warneuk*

MR. GEORGE BELL, F.R.I.B.A.
President of the Glasgow Institute of Architects.

In the seven excursions held during the session were included visits to Kirkcaldy, Dunfermline, Borthwick, and Glasgow. At the last-named town the visit took place under the auspices of the Glasgow Institute of Architects. The annual excursion took place on the 3rd July, and was to Doune Castle and the Queen Victoria School, Dunblane.

The Associate section also carried through a successful series of meetings, and the usual studentship design competitions were held. With reference to these competitions, it was resolved last session to offer a special prize to Associate members attending the College of Art summer sketching classes, for the best work of the session.

The Hon. Treasurer's financial statement for the session showed a satisfactory credit balance of £23 on the ordinary funds for the year.

In accordance with a suggestion from the R.I.B.A. Records Committee, the Council appointed a committee to compile a list of the old building of architectural interest within the association district of the Institute. This record will give information both

MR. FREDERICK BATCHELOR, A.R.H.A., F.R.I.B.A.
President of the Royal Institute of Ireland.

as to those buildings which are suitable for study and those which have already been measured, and will consequently be of very great value to the architectural student.

GLASGOW INSTITUTE OF ARCHITECTS.

During the year the Council has had the subject of "Competitions" prominently before them, and it has been decided to hold a special meeting of the Institute at an early date to consider the whole matter.

In the case of one or two competitions promoted by public bodies within the Institute province, the Institute has been successful in obtaining the amendment of certain of the conditions which were considered unsatisfactory, and exhibitions of the premiated plans have also been held on the suggestion of the Institute.

Arrangements are in hand for holding an exhibition by the Institute, of architectural work, and it is expected that this will take place at an early date.

MR. PERCY ROBINSON, F.R.I.B.A.
President of the Leeds and Yorkshire Architectural Society.

The Institute continues to be the recognised centre for the R.I.B.A. examinations in Scotland. These examinations were held in June and November last.

During the year there has been a considerable increase in the membership of the Institute, which includes within its number nearly all architects of the requisite standing and qualifications in Glasgow and the West of Scotland.

THE ROYAL INSTITUTE OF ARCHITECTS OF IRELAND.

In Ireland, at any rate, the year 1909 has been singularly unfruitful in building enterprise. The consequent lack of activity in the offices of those architects in Dublin who hold seats on the Council of the Institute has enabled these gentlemen to devote themselves, even more assiduously than in former years, to the interests of the profession which they represent. Under the presidency of Mr. Batchelor, three very important undertakings were entered upon this year. The work which these undertakings involved has cast a heavy responsibility on the Council and its officers, and both deserve the gratitude of the members of the Institute in view of the successful issue. When the Irish Universities Bill passed into law, the Council seized the opportunity of memorializing the University Commission, and urging upon it the recognition of the Art of Architecture by establishing a chair of architecture in the National University of Ireland. The Council submitted to the Commission a carefully-prepared statement setting forth its views, and later, on the invitation of the Commission, appeared, by deputation, before it. It is very gratifying to record that, for the first time in Ireland, the Art of Architecture has been granted university recognition, and a chair has been provided. The appointment of Professor of Architecture has not yet (Dec. 1909) been made, but it is hoped that this post will be filled early in the New Year. Very much, of course, depends on the qualifications and personality of the Professor appointed, but the profession in Ireland eagerly look forward to great and lasting benefit by the establishment of a school of architecture in the new university in Dublin.

A very considerable number of the Council's meetings during the year have been devoted to the subject of incorporation of the Institute, and Articles of Association had to be drawn up, by-laws revised, and Board of Trade requirements embodied in these. The incorporation is now practically complete, and the labours of the Council, extending over many months, at an end.

It will be sufficient to mention, in concluding this short resumé of the Council's work during the year, the third of the undertakings previously mentioned. For a great many years the Institute and the Dublin Master Builders' Association have been in correspondence regarding the injustices which the latter body allege existed in the form of building contract generally in use in Ireland. It is a subject for congratulation to record that during the autumn of this year, as the result of several conferences between the Council of the Institute and the Master Builders' Association, a form of contract has been mutually agreed upon. It is now, in draft, under consideration by an eminent King's Counsel, and will, in a short time, it is hoped, be in the hands of the members of the Institute and in general use.

THE ARCHITECTURAL ASSOCIATION OF IRELAND.

In submitting their twelfth annual report, the committee regret a spirit of apathy exists amongst the members, which all those who have the welfare of the association at heart earnestly hope may be removed before it assumes a more serious aspect. The committee regrets to report a decrease in membership, which now stands at 94. The committee have adopted a new method of carrying on its work for the purpose of relieving the hon. secretaries of some of their labours, which heretofore proved to be very onerous. The system adopted was that of arranging the routine work of the general committee under various heads, and having it carried on by sub-committees — entitled "Programme," "By-laws," "Museum," "Press," and "Publication,"—all of whose recommendations were subject to the approval of the general committee before being put into execution. A novel feature at the general meetings—discussions by the members of set subjects of architectural and artistic interest—has proved very successful. On January 12, Sir Aston Webb gave, "A talk to Students; on January 26, amalgamation of the A.A.I. with the R.I.A.I. was discussed; on February 9, there was a discussion on, "Is the establishment of a University Degree in Architecture advisable?" on February 23, a paper on the decorative treatment of brickwork was read by Mr. F. G. Hicks, F.R.I.B.A., and on March 23, the subject of the discussion was: "Is a Modern Irish Style of Architecture possible, and, if so, what should be its characteristics?" Sir Aston Webb's address was a great success,

MR. GEORGE F. BECKETT.
President of the Architectural Association of Ireland.

Photo: Gunn and Stuart.
MR. T. E. ECCLES, F.R.I.B.A.
President of the Liverpool Architectural Society

Photo: J. F. Forde.

MR. GEO. T. BROWN, F.R.I.B.A.
President of the Northern Architectural Association.

the Leinster Hall, which was engaged for the occasion, being crowded. Sir Aston presented to the library three copies of Ruskin's "Two Paths." The various classes were carried on this session, but the meagre attendances rather militated against their success. The museum, under the secretaryship of Mr. Joseph Geoghegan, continues to be an unqualified success, and a steady source of revenue to the association. The committee consider that, as this section of the association's activities has become so important, it would be advisable that they should have a permanent seat on the committee. Very few visits to buildings were made owing to a lack of works of importance in or near the city; but some very successful sketching visits were held. The library has been much used by the members, though additions to the stock of books have not been many. An art class was formed late in the session, taking the place of the old design club. The president is Mr. Geo. F. Beckett; hon. secs., H. G. Leark, Board of Works, Upper Merrion Street, Dublin, and W. S. Keatinge, 31, South Frederick Street, Dublin; registrar, Edwin Bradbury.

LEEDS & YORKSHIRE ARCHITECTURAL ASSOCIATION.

At the annual gathering of the society, at the Queen's Hotel, Leeds, on Nov. 11th, Mr. Percy Robinson, F.R.I.B.A., delivered his presidential address, for which he was cordially thanked on the motion of Mr. Butler Wilson, F.R.I.B.A. In seconding, the motion, however, Mr. Bowman took exception to the president's commendation of the Town Planning Bill, a measure which he, personally, regarded as having been framed by a body of gentlemen, possessing little knowledge of town planning, and in such case of little use to a city like Leeds.

The society, which was founded in 1876, and incorporated in 1885 under the Companies Act, had, according to the last-issued report, a total of 165 members. Prizes offered for the current session include a silver medal for measured drawings of old work, a prize for the construction of a timber dome, and prizes for an essay, for sketching, and for design. The hon. sec. is Mr. Albert E. Kirk; assistant hon. sec., Mr. R. W. Thorp.

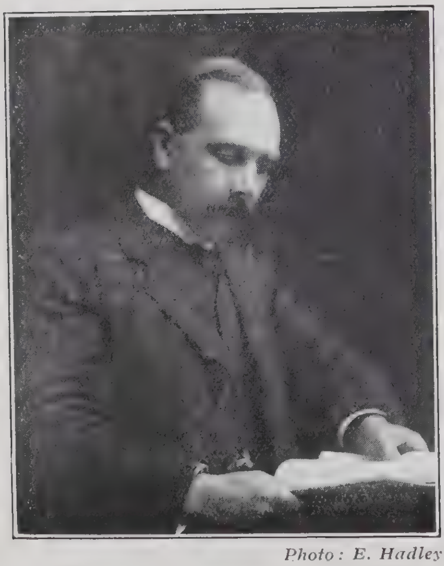


Photo: E. Hadley.

MR. A. ERNEST HEAZELL, F.R.I.B.A.
President of the Nottingham Architectural Society.

LEICESTER AND LEICESTERSHIRE SOCIETY OF ARCHITECTS.

This society held its thirty-sixth annual general meeting in April, Mr. W. E. Veites, president, in the chair, when the question of appointing a town planning committee was fully discussed, and it was decided that for the present the interests of the society in this question might be safely left in the hands of the Council. The Council in reporting upon the Housing and Town Planning Bill, had remarked that "as our municipalities have not shown the faintest trace of either an æsthetic sense or any prospective initiative, there is a danger that section 2 of the Bill may remain a dead letter outside a few fortunate areas." The Council had recommended that, in view of the possibilities afforded by the Bill, a committee should be formed, with power to co-opt influential men outside the society, to study the problems that will arise, to be ready with mature ideas, to assist in the formation of a healthy and well-informed public opinion, and generally to make up for municipal and educational shortcomings. The hon. sec. is Mr. W. K. Bedingfield, Market Street.

THE LIVERPOOL ARCHITECTURAL SOCIETY.

During the past year the position of the society, which has been steadily progressive for a number of years past, has been marked by a further improvement both numerically and financially. The administrative and other work affecting professional interests has also been steadily carried on.

One of the more important movements of the society has been made in conjunction with the Manchester Society of Architects, a movement brought about by reason of the growing number of unlimited competitions and the difficulties of dealing with unsatisfactory clauses inserted in the general conditions. It is considered that more satisfaction is likely to be obtained from the use of a recognised form of conditions drafted by the profession, then from the varied conditions compiled by individual competition promoters. A model form of conditions has been prepared, and having been approved by the two societies, has been submitted to and is now being considered by the Royal Institute of British Architects.

At the sessional meetings, papers have been read by Thos. H. Mawson, hon. A.R.I.B.A., on "The Peace Palace at the Hague," with special reference to the parks and gardens; T. Faulkner Shepheard on "Competitions"; Mervyn E. Macartney, B.A., F.R.I.B.A., on "The Three Churches of S. Paul"; T. T. Rees, F.R.I.B.A., on "The Liability of Architects to Clients and Public"; H. Inigo Triggs, A.R.I.B.A., on "The Planning of Squares and Open Spaces"; Ramsey Traquair, A.R.I.B.A., on "The Mediæval Architecture of Greece"; T. R. Spence on "The Elements of Design in Internal Decoration"; F. E. G. Badger, deputy City building surveyor, on "Reinforced Concrete and Steel Frame Buildings."

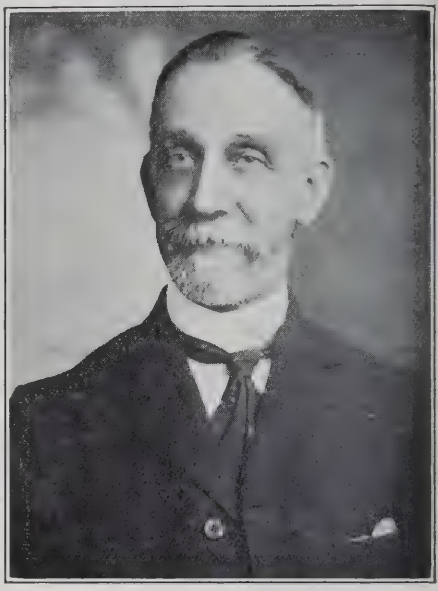


Photo: Thwaites.

MR. THOMAS MONKMAN.
President of the York and Yorkshire Architectural Society.

MANCHESTER SOCIETY OF ARCHITECTS.

In the forty-fifth annual report of the Council it appears that the membership had reached the total of 265.

The Council having seriously considered the action of members of the society who submit designs in architectural competitions when the conditions of such competitions have been deemed unsatisfactory by the Council, have, on the instructions of the members assembled in general meeting, passed an additional by-law, of which the following is a copy: "16. A member shall be considered to have failed in the observance of a lawful regulation of the society, or of a lawful regulation, by-law or order of the Council, within the meaning of article 61 of the Articles of Association, and shall be liable to the penalties therein stated if he shall submit either directly or indirectly a design in any architectural competition the conditions of which are unsatisfactory to the Council and of which notice has been given to the members by the secretary." A committee was appointed to consider the clauses of the Town Planning Act, and where advisable to communicate with local authorities and influence public opinion on the question. A committee has been appointed to consider the subject of re-inforced concrete and the fact that the Manchester Corporation bylaws contained no provisions regarding the

Photo: Henderson.

MR. W. J. HALE., F.R.I.B.A.
President of the Sheffield Society of Architects.

erection of buildings in this material. An intimation has been received that new bylaws bearing on the subject will be included in the next Bill submitted by the Corporation to Parliament. The Council suggested to the R.I.B.A. that certain alterations should be made in the document called "Professional Practice as to the Charges of Architects," with a view to limiting the liabilities of architects for defaults of builders; corresponding alterations will also be required in the document issued by the Institute called "Agreement and Schedule of Conditions of Building Contracts." The secretary of the Institute acknowledged the receipt of the suggestions and promised to lay them before his Council. The president is Mr. P. S. Worthington; hon. sec. and treasurer, Mr. Isaac Taylor, assistant hon. sec., Mr. Gerald Sanville; secretary, Mr. Arthur S. Brewis, F.C.A., Canada Chambers, 36, Spring Gardens, Manchester.

NORTHERN ARCHITECTURAL ASSOCIATION.

Mr. C. S. Errington, A.R.I.B.A., the hon. secretary, through Mr. J. Berkeley Cubey, assistant secretary, reports that the commemoration of the society's fiftieth anniversary has, of course, been the chief event of the year. Two of the founders, Mr. E. R. Robson and Mr. F. R. N. Haswell, were able to be present at the celebration dinner. During the summer excursions were made to Lumley Castle (the seat of the Earl of Scarborough), and to the Romano-British City of Corstopitum. Denton Hall, an interesting Jacobean House, near to Newcastle, was also visited. In July the annual excursion was held in the neighbourhood of Selby. The fine restoration of the Abbey was inspected, and much admired, as was also the interesting church at Hemingbrough, about 12 miles from Selby. The Winter session was opened on November 10, when the president Mr. G. T. Brown, F.R.I.B.A., delivered his inaugural address, and on December 8 Mr. John W. Simpson, of London, read a paper, entitled, "With Share and Mattock." The present membership is about 246. Mr. Geo. T. Brown, of Sunderland, the president, was re-elected for the third successive year, and is a member of the Council of the Royal Institute. Several local architectural competitions have been brought to the notice of the Practice Committee, and representations have been made to the promoters with a view to unsatisfactory conditions being amended. Hon. sec., Mr. C. S. Errington, A.R.I.B.A., 6, Higham Place, Newcastle-upon-Tyne.

NOTTINGHAM ARCHITECTURAL ASSOCIATION.

The total membership on March 31st, 1909, was 84, viz., two honorary members, 36 members, and 46 associates. President, Mr. A. Ernest Heazell, F.R.I.B.A.; hon. sec. and treasurer, W. Brandreth Savidge, A.R.I.B.A., Queen's Chambers, King Street.

SHEFFIELD SOCIETY OF ARCHITECTS & SURVEYORS.

In the summary of last year's work reference was made to three subjects which had most interested the members of this society during the year then brought to a close.

With respect to two of these satisfactory progress may be recorded. The proposed building by-laws have been further considered and discussed in detail with the special committee appointed by the City Council. Several important alterations have been promised by this committee, and there is now every likelihood that this much vexed question will be satisfactorily settled.

The Department of Agriculture connected with the local University has completed the second year of its existence, and the results achieved fully warrant the support which has been accorded to it by the members of this society and other architects and surveyors practising in the district. The number of students has increased, especially those taking the advanced subjects, and it is hoped that future years will show a much greater growth in this direction.

A pleasing feature of the year's work has been the increase in the membership of the society; after allowing for resignations there is a net increase of six; the number now standing at 129, as compared with 123 last year. This increase is due to the election of additional student members, and for this reason it is a hopeful sign, as it is from the juniors alone that provincial societies may hope to add to the number of their members

YORK AND YORKSHIRE ARCHITECTURAL SOCIETY.

The membership of this society is gradually increasing, and up to November reached a total of 50, composed of 5 Hon. Members, 28 Fellows, and 17 Associates. The society is allied to the R.I.B.A., and has nearly the whole of the North Riding of Yorkshire as its working area.

Owing to the general dullness in the architectural profession generally, the work of the society has been light this session. Several visits have had to be abandoned, owing to the persistent bad conduct of the clerk of the weather. A visit was made to Castle Havard, the seat of the Earl of Carlisle, and one of the magnificent works of Sir J. Vanburgh, the party was ciceroned by Mr. A. B. Burleigh, one of the vice-presidents. A good muster was made when the society visited St. William's College, York, during the progress of the reparation by Mr. Temple Moore, architect. Several fine 15th century fireplaces have been unearthed, and the members noted with satisfaction the very conservative manner the restoration, or rather, reparation, was being executed.

Another visit was made to Bolton Hall, in Wenslydale, the seat of Lord Bolton, and the Wensly church and village, where several interesting sketches were made.

A lecture was given by Mr. Percy Robinson, F.R.I.B.A., on "Some Modern Conditions of Architectural Design," and was listened to by a small but appreciative audience. The lecturer showed some interesting illustrations in the science of modern architecture, of both English and Foreign examples, and proved that English Civic Architecture compared very favourably with that on the Continent.

The R.I.B.A. prize drawings were on view in the society's rooms for three days, and were inspected with much interest both by members of the profession and the general public. The President for the forthcoming session is Mr. S. Needham; the vice-presidents, Mr. A. B. Burleigh, and Mr. J. H. Rutherford; the hon. treasurer is Mr. T. Monkman; the hon. librarian is Mr. E. A. Pollard; and the hon. secretary is Mr. Harold E. Henderson, assisted by Mr. R. R. T. Smith.

THE NATIONAL FEDERATION OF BUILDING TRADES EMPLOYERS AND ITS WORK IN 1909.

State of Trade.

This year appears to mark the turning point in an unusually prolonged period of depression in this industry.

The first half-year showed no improvement, but in the second half-year, some small indications of trade revival have been visible in the way of better employment reports from the Trades Unions connected with building. These, together with improved trade statistics in other industries, give ground for hope that the worst is over, and that builders may expect better trade in 1910, directly the present uncertainty as to taxation is removed by the result of a general election.

The pressure of "bad times" has brought into prominence the need for reforms in certain of the relations between builders, architects and clients.

Most of the questions referred to have been dealt with from time to time in our columns, it will suffice here to merely tabulate them. They are:—

"The Extent to which Builders' Capital is Lock up in Completed Contracts through excessive Retention of Money"; and their consequential dependence on bankers' advances, which may be withdrawn at any time with disastrous results to the builder individually, and injury to the credit of the rest of his confrères in the trade.

"The Inadequate Time Allowed for the Preparation and Delivery of Tenders"; with consequent impossibility of giving adequate study to the preparation and correctness of tenders.

"The Inviting of Tenders Without Supplying Quantities Prepared by a Competent Surveyor, to the Respective Competitors"; resulting in wasteful expenditure on the provision of various sets of quantities and sets of tenders which do not admit of fair inter-comparison.

"The Requiring of Priced Schedules to be sent in with the Tenders"; involving increased pressure on each competing builder to provide detailed priced schedules when ultimately only one set, that of the accepted tender, is really required, and incidentally picking the competitor's brains for the advantage of others, without compensation.

"The Making use of Forms of Tender and Conditions in Schedules of Quantities to Compel Acceptance in Advice of Onerous or Unfair Conditions of Contract"; under penalty of competitors' exclusion from tendering.

Much attention has been given to these questions, and an attempt made to enlist the assistance of the Professional Associations in providing a remedy in the shape of an agreed form of conditions under which tenders are sent in.

Another question of much importance is the making of engineers or architects sole referees under contracts wherein they also act professionally as engineers or architects for the execution of the contract, thereby putting them in the false position of party to, and arbitrator of, any dispute that may arise.

Several cases recently before the courts have elicited judicial pronouncements condemnatory of this anomaly, which the Federation desires to see abolished, in the true interest of all parties concerned.

Legislative.

The building trade continues to be the subject of considerable attention on the part of the Legislature, as a reference to the following measures before Parliament during 1909 will show:—

"The Building and Engineering Works Bill," a Government measure to amend the Factory Acts, by extending certain provisions thereof to enable scaffolding, etc., regulations to be applied to the building trade, was again introduced this session, but owing to pressure of other matters has had to be again dropped.

"The Trade Disputes Bill," which sought to make arbitration compulsory in trade disputes, would have injuriously affected the existing National Scheme of Conciliation which already deals with trade disputes, and was opposed therefore. It has since been dropped.

"The Trade Boards Bill," which gave power to the Board of Trade to schedule other trades than those specified in the Bill, and which it was feared might result in some sections of the building trade being scheduled as a sweated trade, was made the subject of representation by deputation to Mr. Churchill with entirely satisfactory results.

"The Housing and Town Planning Bill," which contained a clause, No. 30, strongly objected to by the Federation, was also made the subject of representation to the President of the Local Government Board. The clause was eventually struck out.

"The Labour Exchanges Bill," under which the building trade is scheduled as one of those to whom the Act shall apply; the regulations for the working of these Exchanges are expected to be issued very shortly, and will require the careful consideration of the Federation, whose members will be expected to assist on the Managing Committees, and by their example and influence help largely to make the Act a success.

Fair Wages Clause in Government Contracts

The revision of the House of Commons resolution as to fair wages in contracts, and the activity displayed by Labour representatives on various Municipal bodies throughout the country made it desirable for the Federation to draft model fair contract clauses, for the guidance of its various branches in negotiations with local authorities.

Lead Poisoning.

The question of lead poisoning in the building trade is engaging the attention of the Home Office, and a Departmental Committee on which the Federation is represented by Mr. J. W. Bellamy, of Birmingham, has been appointed to go into the matter, presumably with a view to legislative action later on.

Relations with Workmen.

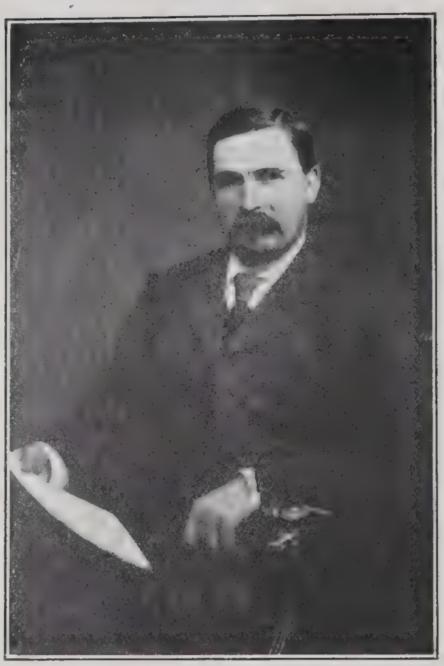
Relations with the workmen have continued good on the whole, most of the differences which have arisen has been settled by the Conciliation Boards, and the year ends without any serious dispute in progress. Considering the depressed state of trade, demands on the part of the employers for reductions of wages have been very few, but a good many demands for shortened hours, particularly before breakfast in winter, and for the abolition or mitigation of restrictions in connection with boundaries and walking time, etc., have been put forward by employers and been met by the workmen with demands for advances of wages, etc. Generally the decisions have rather favoured the contentions of the employers.

An important extension of the principles of Conciliation has been made by the completion of a revised National agreement between this Federation (and its ally the National Association of Master Plasterers), and the National Association of Operative Plasterers; the old agreement only dealt to a limited extent with disputes, but the new agreement applies the principles of conciliation to every dispute, and provides the necessary machinery for dealing therewith on lines similar to those in force in the larger conciliation scheme. This event also betokens the beginning of a new, and more friendly era, in the relations between the parties to it.

The desire of the builders' labourers for admission to the conciliation scheme has been granted, as far as existing circumstances would permit, probably as time goes on their privileges in this respect will undergo extension.

Development.

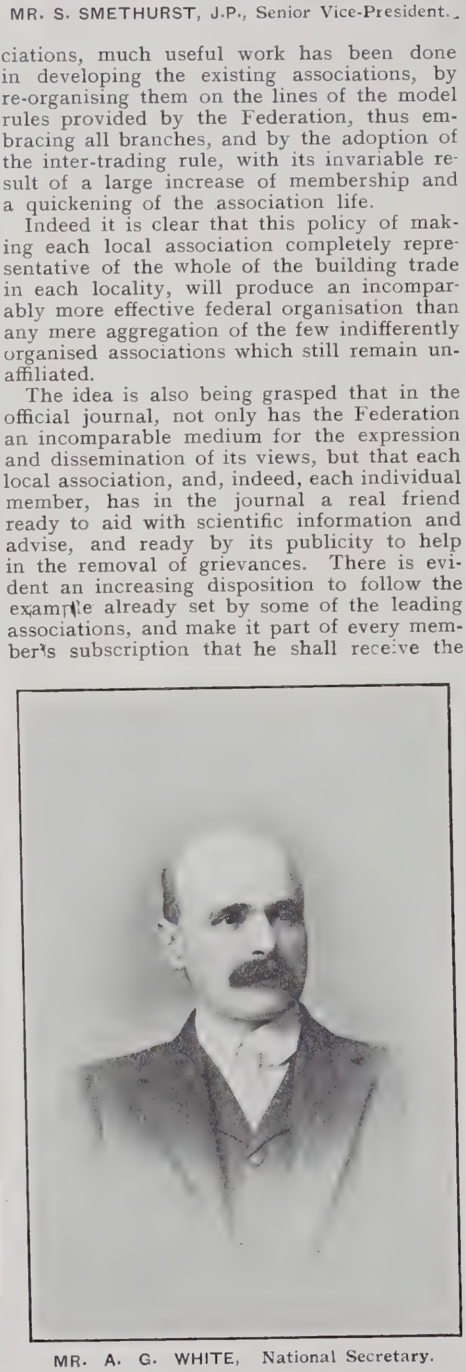
Although the times have not been favourable to the creation of many new branch associations, much useful work has been done in developing the existing associations, by re-organising them on the lines of the model rules provided by the Federation, thus embracing all branches, and by the adoption of the inter-trading rule, with its invariable result of a large increase of membership and a quickening of the association life.



MR. S. SMETHURST, J.P., Senior Vice-President.

Indeed it is clear that this policy of making each local association completely representative of the whole of the building trade in each locality, will produce an incomparably more effective federal organisation than any mere aggregation of the few indifferently organised associations which still remain unaffiliated.

The idea is also being grasped that in the official journal, not only has the Federation an incomparable medium for the expression and dissemination of its views, but that each local association, and, indeed, each individual member, has in the journal a real friend ready to aid with scientific information and advise, and ready by its publicity to help in the removal of grievances. There is evident an increasing disposition to follow the example already set by some of the leading associations, and make it part of every member's subscription that he shall receive the journal regularly. Conferences of Secretaries have been held in the various districts, and also nationally for the consideration and discussion of organisation, and other matters.



MR. A. G. WHITE, National Secretary.

Relations have been maintained with kindred organisations on the Continent, the proposals for an International Federation of the building trade have been advanced a stage by the drafting of a constitution, and the visit of a large number of builders from Belgium to Liverpool, Sheffield and London was made the occasion of a pleasant interchange of courtesies.

Friendly intercouse continues with the Australian and South African Builders' Associations, whose members frequently consult the National Secretary when visiting England.

A suggestion is now under consideration for the formation of a closer link in the shape of a special Colonial membership to enable Colonial associations or individuals to become affiliated to the home body.

The Federation Secretary is also willing to arrange International facilities for the sons of members to study abroad, exchanging with the sons of members of foreign associations who wish to study here.

THE FEDERATION PRESIDENT.

The President of the National Federation of Building Trades Employers of Great Britain and Ireland, is for this year Mr. Ernest J. Brown, a member and past President of the London Master Builders' Association, which showed its appreciation of his worth and services by nominating him to high office in the Federation. If we would express in the fewest words Mr. Brown's qualities as a President, we should say that in personality he was impressive and sympathetic; in character, frank and sincere; and in method, tactful, frank, and unpretentious.

The year has been a busy one for the president, who, in addition to dining frequently in divers places, at the hospitable tables of county federations and local associations, has conducted many meetings, and represented the Federation on various conferences of an important kind, with kindred organisations, or Government departments. In the frequently expressed words of his colleagues, Mr. Brown "makes a good president," and it will be an ample recompense to him to know that his work for the Federation is appreciated, for he is, and always has been, an ardent supporter of, and believer in, the National Federation. Only those behind the scenes know how much his tact and influence have done to consolidate the Federation in the South. Mr. Brown was the first to recognise the advantage which would accrue to the Federation, by associating with it this Journal, as the official Journal of the Federation, and was largely instrumental in bringing about the connection. He is never tired of impressing upon the members of the Federation the importance and useful possibilities of their Press organ.

Mr. Brown is a versatile man; takes a keen interest in all kinds of sport, cycles, golfs, motors, plays cricket, and acts as hon. secretary to the Eltham Golf Club. On the artistic side he is devoted to music, and was for 12 years hon. secretary and treasurer of the Lombard Amateur Musical Society. He is one of the three tallest men in the Federation, his compeers being Mr. Smeethurst, its senior vice-president, and Mr. Storrs, the chairman of the National Board of Conciliation; each of these gentlemen is over 6ft. in height, and they make an imposing trio when together.

Mr. Brown is a native of Braintree, in Essex, and a son of Mr. James Brown, J.P., a well-known member of the Metropolitan Asylums Board, and founder of the firm of James Brown and Sons, Ltd., London. As a former partner in the firm of James Brown, Son, and Blomfield, Mr. Brown gained experience in the building trade, and is now

Photo: Thomas Fall.

MR. ERNEST J. BROWN.

President of the National Federation of Building Trades Employers of Great Britain and Ireland, 1909.

director of the Frazzi Fireproof Construction, Limited.

He has also found time to render public service as vice-president of the Romford Rural District Council, and the Romford Assessment Committee. By those who know him, the president of the National Federation is voted "one of the best," and he enjoys the respect and confidence of every one with whom he is brought into contact.

THE LONDON MASTER BUILDERS' ASSOCIATION.

In writing the history of a year's work that has just been completed, it is always a matter of difficulty to pick up the threads of the previous year and to follow smoothly the course of events without missing out any important details.

The past year has been a gloomy one in the building trade—it has always been a case of hoping against hope, watching for the least sign of improvement, catching at every little straw, but alas! with always the same result; "as you were," or even a little worse!

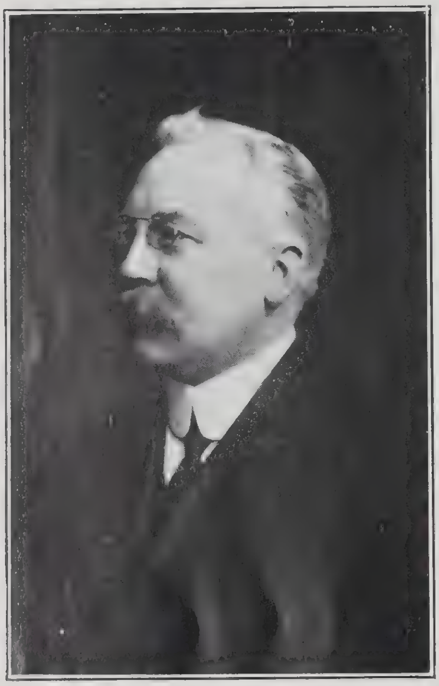


Photo: Lang Sims.

MR. F. G. RICE.

President of the London Master Builders' Association.

Notwithstanding all this, the L.M.B.A. has moved rapidly forward, the interest taken in the work by all the members of the Council has been really wonderful. All the meetings have been very fully attended, new suggestions have come forward and have been taken up enthusiastically, and the association has, as it were, suddenly come out of its shell, and become far more of a real live organisation than ever before. Truly, dull times are the ones in which to put one's household in order, and the L.M.B.A. is evidently a firm believer in that axiom.

To a large extent this is due to the persistent energy of its President, backed up by his officers and secretary, and signs are not wanting of other younger members of the association coming rapidly to the front—always a healthy sign in such organisations as this.

After years of unsuccessful attempts to obtain suitable offices for the association and its kindred societies, a home has at last been "booked," and, so soon as the selected buildings in Kingsway are completed, Bedford Street will "know it no more," except in name—a memory only.

Much legislation has taken place during the year, affecting the building trade, and the L.M.B.A. Council has taken its part in various amendments and improvements of many of the Bills that have been introduced. Conferences have taken place that have been productive, not only of good so far as regards the Bills themselves, but of pleasant intercourse between the professions closely allied to the building trade and its representatives.

Such a measure as the Sweated Industries Bill was not allowed to go unchallenged, and the deputation to Mr. Winston Churchill from the Employers' Parliamentary Council were eminently successful in gaining their point, under the leadership of that old Parliamentary hand, Mr. William Shepherd, whose clever insinuation made at the close of the interview "that it would be beneficial for those interested in the Bill to be able to see how far Mr. Churchill had met the views of the deputation by reading it in their morning papers" will long be remembered by those who were present, as the idea born of a master mind.

Another very important interview that took place during the year, was that with the permanent officers of the Board of Trade with reference to the Labour Exchanges, a measure of rather doubtful benefit to the building trade generally or to the workmen. Builder's foremen are very conservative in their methods, and it will be difficult to induce them to make any alteration in their ways of obtaining what labour they require, especially when work is so slack and workers so many.

It is not our intention here to discuss all the different Bills that have been brought forward, and it will suffice to mention the most important ones, to which the association has given particular attention.

They are, in addition to those already mentioned Factory and Workshop Act, 1901 (amendments), Railways (eight hours), Road Traffic, Trade Disputes, Trade Boards, Compulsory Weighing and Measurement, Engines and Boilers (persons in charge). To those must be added the Finance Bill, and it will be remembered how some of the members of the L.M.B.A. took prominent part in the meeting convened at Queen's Hall by the surveyors. A slight but important alteration was arrived at with the R.I.B.A. in the form of contract, which will obviate the trouble of the real meaning of the original clause in question being properly understood.

Another important subject which has been discussed was that of the supplying of quantities by building owners, and in this respect it is hoped a very great improvement may ultimately result.

One of the most interesting functions of the year was that of the dinner to the Belgian builders, given by the association at St. Ermin's Hotel, which was the headquarters of the visitors for two or three days in London.

The delightful "camaraderie" that was in evidence upon the occasion will be remembered for many a long day by the members who attended. It was a revelation to all when the President, Mr. Rice, and Mr. Higgs made their speeches in French, showing a perfect grasp of the intricacies of that language and its many difficult idioms in connection with the trade of which they were speaking.

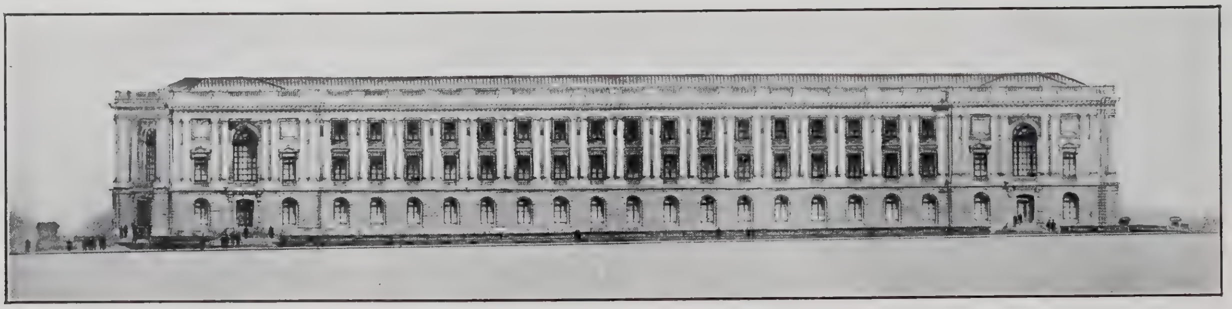
Photo: Brown, Barnes, and Bell.

MR. THOMAS COSTIGAN.

Secretary of the London Master Builders' Association.

The mention of Mr. Rice in this respect offers the opportunity of congratulating the association upon having had him for its president during the past year. As each president goes, one thinks how good a man he has been, how difficult his successor will find it to keep up to the high-water mark he has reached. Mr. Rice's successor will indeed have all his work cut out, for the president for 1909 has excelled himself. His firm insistence has often ended in opposition collapsing, and a speedy result being arrived at, his quiet quaint quips have been appreciated, for he possesses a great fund of humour, added to which he has proved himself a leader full of energy and tact, and has put his heart into his work from start to finish.

We are not alone in thinking it is a pity so many of the past presidents have stepped down from the chair and buried themselves in oblivion, and we sincerely hope that Mr. Rice will set a better example and often be in evidence for years to come at the Council's deliberations.



OFFICE BUILDING OF THE SENATORS, U.S. CAPITOL. JOHN M. CARRÈRE, ARCHITECT.

RECENT BRITISH BUILDINGS.

THE VICTORIA AND ALBERT MUSEUM.

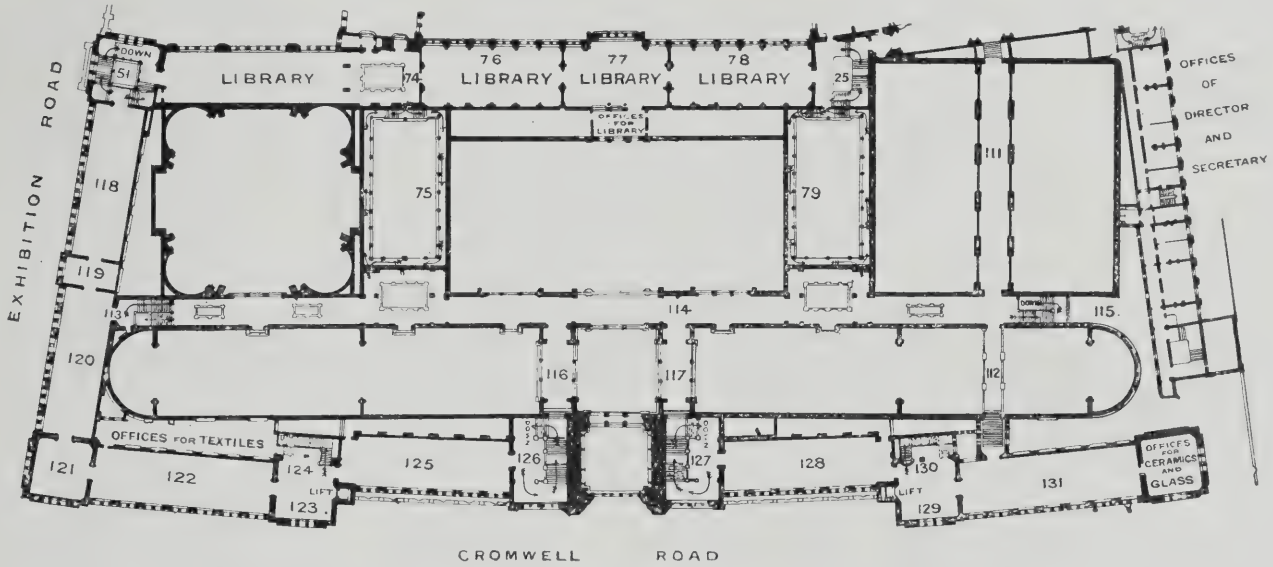
Sir Aston Webb, C.B., R.A., F.R.I.B.A., Architect.

The Victoria and Albert Museum was formally opened by his Majesty the King on June 26th. Designs for these buildings were invited in 1891 from six selected architects, and those submitted by Sir Aston Webb, C.B., R.A., were adopted. No decisive step was taken, however, until 1898, when the then Chancellor of the Exchequer, Sir Michael Hicks-Beach (now Lord St. Aldwyn), found himself in possession of a Budget surplus, from which he allotted a sum for the erection of the museum, and Sir Aston Webb was instructed to proceed with the plans. The foundation stone was laid by Queen Victoria on May 17th, 1899.

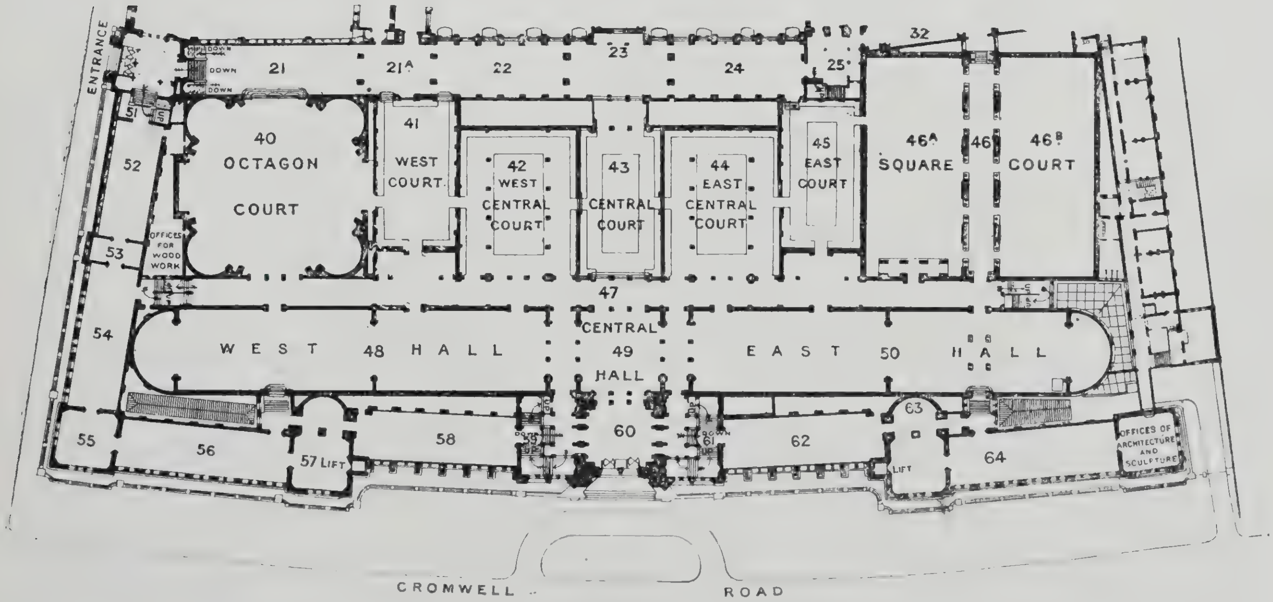
The new buildings have a frontage of 720 ft. to Cromwell Road, and 275 ft. to Exhibition Road. The total length of the perimeter of the site is occupied by three storeys of side-lighted galleries, the fourth-floor galleries being top-lighted, while the remainder of the site is covered with top-lighted courts. The total length of these galleries alone is three-quarters of a mile, and, including the long gallery of two floors that runs down the centre of the building, the galleries in the new buildings are just one mile in length, while the top-lighted courts have a superficial area of 6,500 square yards.

The Cromwell Road front, in the centre of which the main entrance is situated, is in a "flat" curve, following the line of the road, partly in order to secure a right angle at the corner of Exhibition Road, and partly to bring the building into line with the Natural History Museum. Other considerations that influenced the design were the great mass and height of the old Science building, which suggested the domes on the new, in order to preserve the scale.

The front is faced with specially selected Portland stone, red brick being freely introduced in frieze and piers in sympathy with the buildings already erected. The sculptured decoration includes statues representing thirty-two famous British artists and craftsmen, statues of ten craftsmen being on the Exhibition Road front, while facing Cromwell Road are, in the centre, ten painters; on the west flank, six sculptors, and on the east flank, six archi-

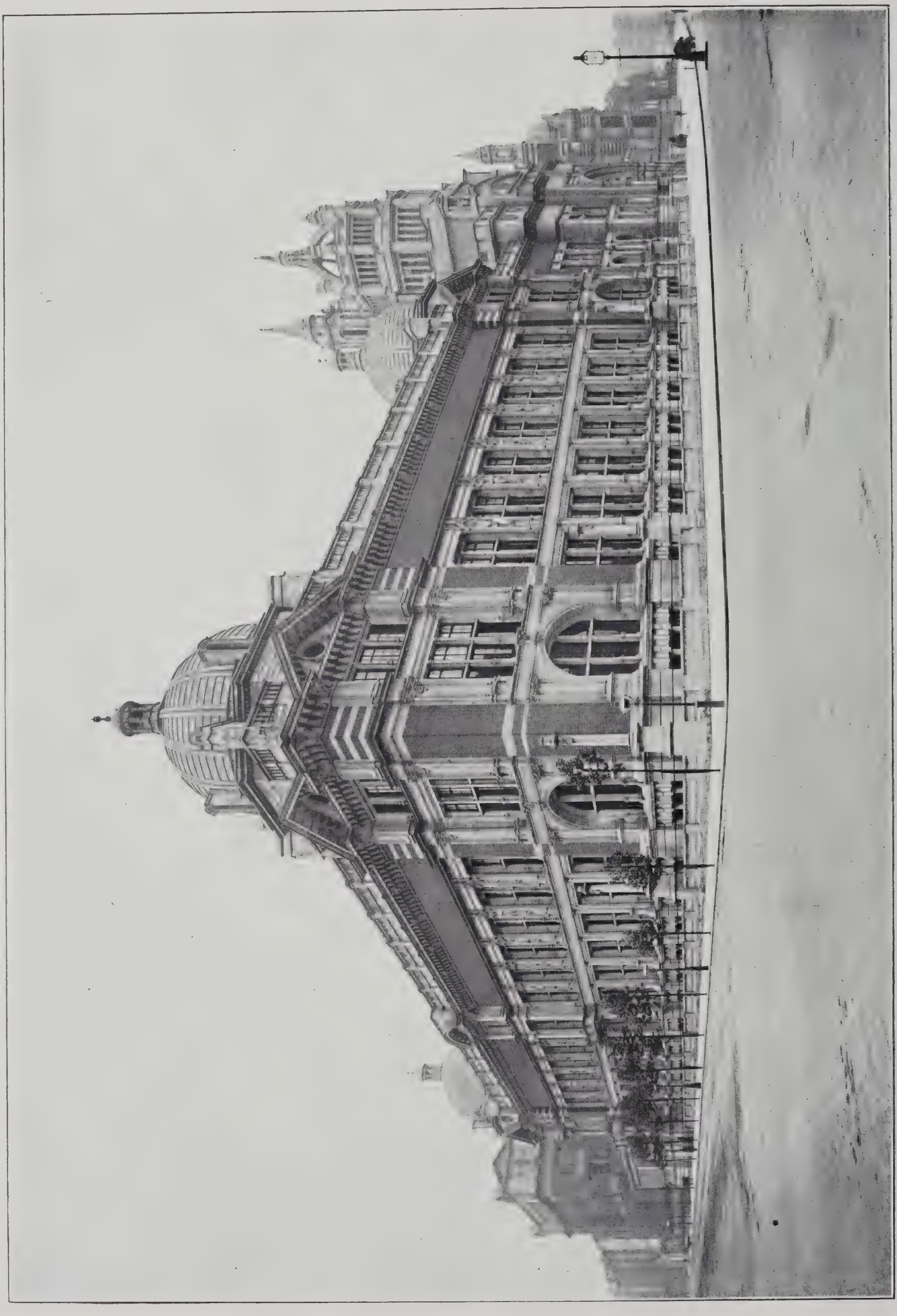


First Floor Plan.



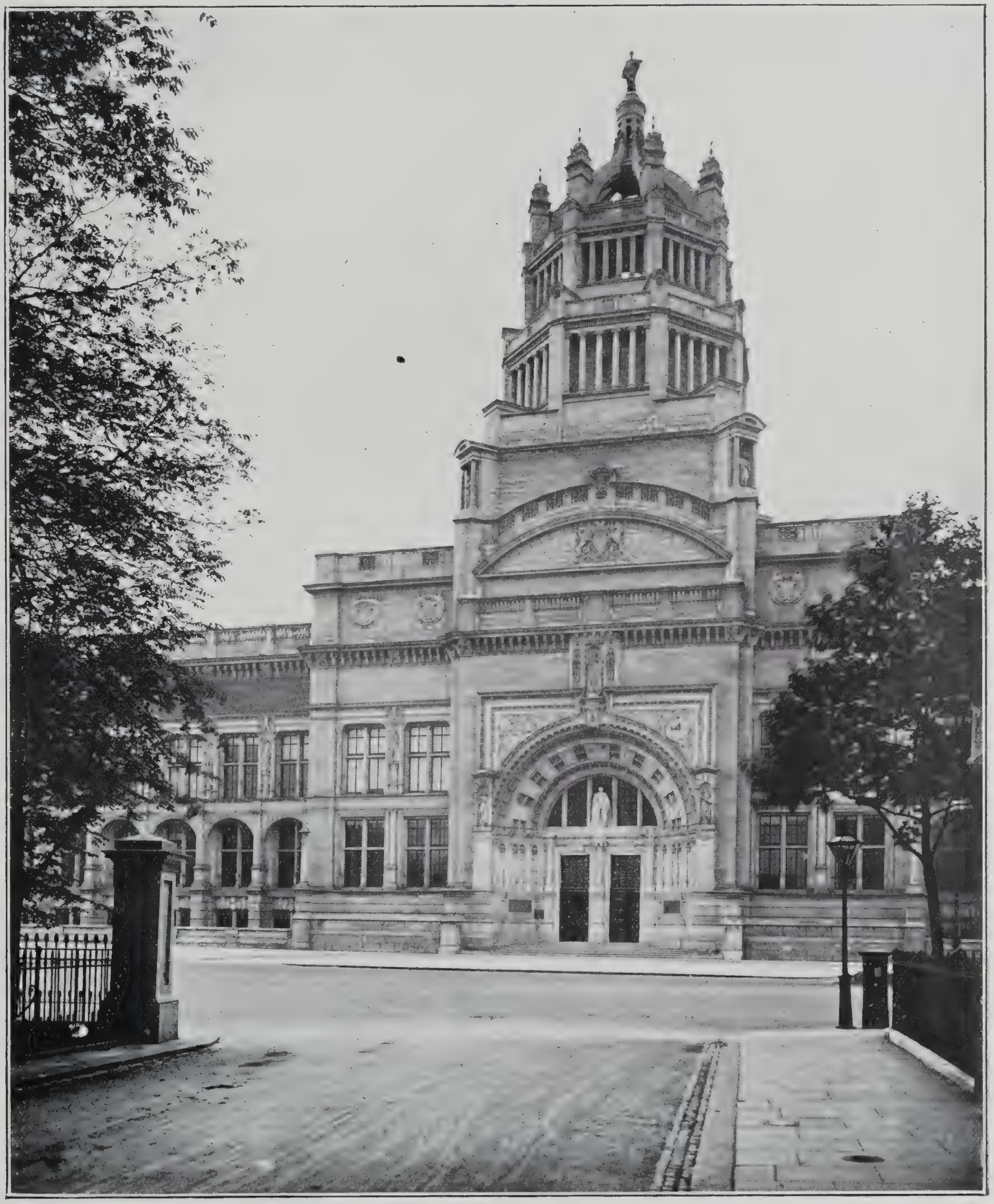
Ground Floor Plan.

THE VICTORIA AND ALBERT MUSEUM. SIR ASTON WEBB, C.B., R.A., F.R.I.B.A., ARCHITECT.



THE VICTORIA AND ALBERT MUSEUM: GENERAL VIEW. SIR ASTON WEBB, C.B., R.A., F.R.I.B.A., ARCHITECT tects. The statues of Millais, Watts, Leighton, and Constable were respectively executed by four students of the College of Art under Professor Lanteri; and two each of the other statues were entrusted to the following sculptors: Messrs. Lynn Jenkins, Paul Montford, S. W. Babb, G. Bayes, A. Broadbent, W. S. Frith, J. Gamble, E. G. Gillick, A. H. Hodge, A. B. Pegram, J. W. Rollins, R. Shepherd, A. G. Walker, and O. Wheatley. The figure of Fame on the lantern, and the two figures in the buttresses below—representing respectively Architecture and Sculpture—are by Professor Lanteri, while Mr. Alfred Drury, A.R.A., executed the statue of Queen Victoria, with her supporters, St. Michael and St. George; the statue of the Prince Consort, under the arch; and the figures of Knowledge and Inspiration, one on each side of the entrance; as well as the carved panels in the archivolt, each panel bearing, in letters of gold, a portion of a quotation from Sir Joshua Reynolds's Discourses: "The excellence of every Art must consist in the complete accomplishment of its purpose." The carved spandrels representing Truth and Beauty are by Sir George Frampton, R.A.; the statues of King Edward VII. and Queen Alexandra by Mr. Goscombe John, R.A., and the general architectural carving on the front has been done by Mr. W. S. Frith.

In planning the interior, the architect had by no means a free hand, as he was under the necessity of "linking up and adapting to the various levels of the old building." The vestibule, 40ft. by 40ft., runs up through two floors of the building. The walls are faced with Portland stone, and the ceiling is of teak, carved and inlaid with a holly motif. The floor, composed of Sicilian black, Irish red, and Swedish green marbles, was laid by Burke and Co., who also laid the mosaic pavement in the Persian Court and in the libraries, etc. Right and left of the vestibule, the staircases leading to the three floors of the side-lighted galleries are lined with Pavonazza marble in flat slabs. The columns are of Brescia, and the steps of Piastraccia. The walls of the galleries and courts, being intended for the exhibi-



THE VICTORIA AND ALBERT MUSEUM: MAIN ENTRANCE. SIR ASTON WEBB, C.B., R.A., F.R.I.B.A., ARCHITECT.

tion of objects, are of course kept perfectly plain, but "an attempt has been made to prevent weariness to the visitor by avoiding galleries of undue length, by providing vistas and glimpses through the building in passing, and by varying the sizes, proportions, and design of the various courts and galleries." The long gallery gives easy access to all the courts on each side, and the courts on the north side of the gallery neither oppose barriers to the visitor, nor confuse him as in a maze.

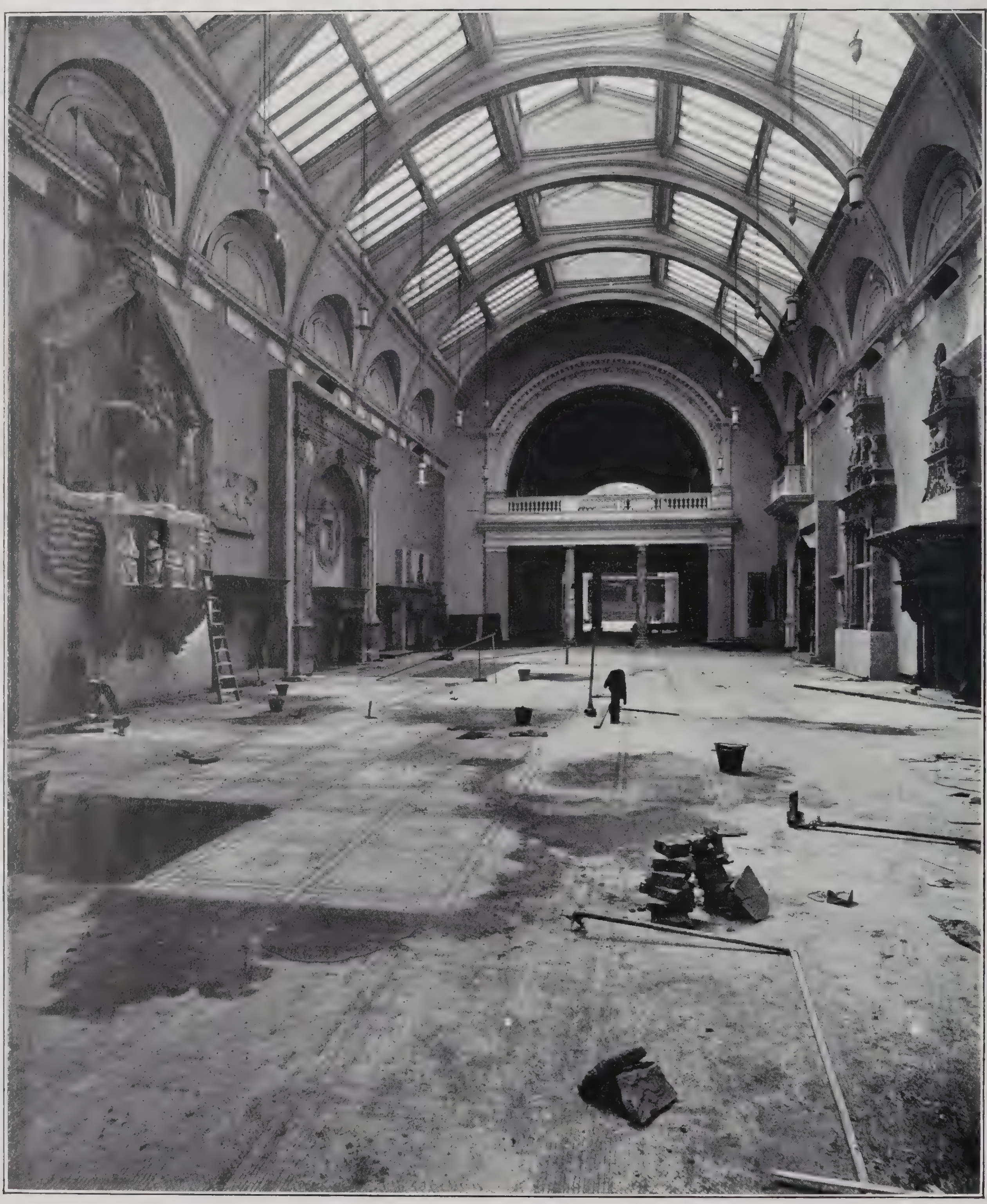
Flanking the domed central hall are the long eastern and western halls, 50ft. wide, in which the larger architectural exhibits are being placed. The west and east central courts leading from the central court that forms the main entrance to the older portions of the Museum, have their naves and aisles divided by arcades of Basilican types. The naves have flat ceilings, and the isles are vaulted. The great octagon court is 110ft. in diameter, and 65ft. high in the centre.

The galleries are 32ft. wide and 20ft. high, except in the lower ground floor, where they are 18ft. high. The windows are carried up close to the ceiling, and on this wall the glass area is equal to the wall area, so that the opposite wall is completely lighted. All the walls are lined with Cranham bricks, so that objects may be easily fixed to them, while all walls towards internal courts are built hollow.

The floors of the galleries are of polished teak, those of the courts being paved with marble mosaic, laid out in squares to facilitate the arrangement of cases and objects. In all there are 7,000 super yards of the mosaic, each yard representing 5,184 cubes. The whole was carried out by the Art Pavements and Decorations, Ltd.

Naturally, the heating and ventilating arrangements have been devised with extreme care. The heat will be derived from six Lancashire boilers, which have been placed in the basement between the north-west entrance and the College of Science. The Atmospheric Steam Heating Co.'s vacuum system of heating has been installed. Ventilation is on a plenum system, by means of which the air can be changed four times an hour, or more frequently if necessary.

The whole of the glazing on the roofs of the various courts, including the domes,



THE VICTORIA AND ALBERT MUSEUM: EAST HALL, LOOKING WEST. SIR ASTON WEBB, C.B., R.A., F.R.I.B.A., ARCHITECT.

was carried out by W. E. Rendle and Co., on their "Invincible" system mounted on moulded teak bars. The domes were glazed without the use of bent glass.

The general contractors for the foundations and up to the ground floor were Leslie and Co., of Kensington; and Holliday and Greenwood, of Brixton, erected the superstructure, executed all the woodwork, including the fine teak ceiling already mentioned, with its carved and inlaid holly decoration, and all the plumbing work.

The show cases, a range of which is illustrated below, made by Gardiner. Sons and Co., Ltd., have frames of steel, welded by the Oxy-Acetylene process, and covered with polished bronze facings. They are designed to be absolutely dust-proof. Nearly 200 of these metal-framed cases were supplied. The great advantages of these cases are that they are not liable to attacks of insects, are fireproof, and are of much less scantling than would be possible with woodwork.

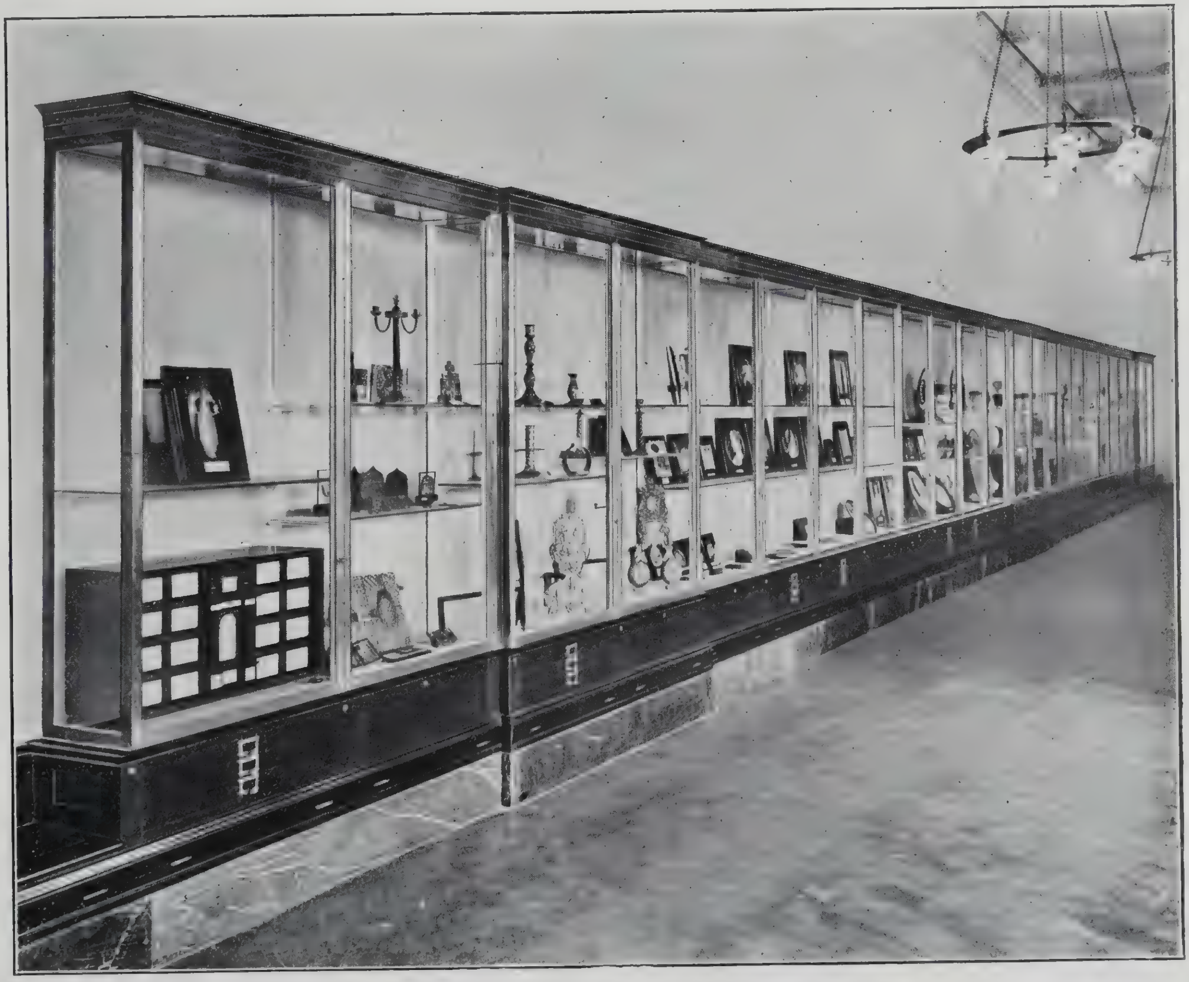
The electrical installation was carried out by T. Clarke and Co., and embodies approximately 5,000 lights, 75 miles of wire, and 95,000ft. of screw galvanised steel tubing. A feature of the wiring is that any of the cables can be easily withdrawn and new wires substituted without interfering with the decorations or flooring. The electric fittings made by the General Electric Co., comprise 300 six-light coronal electroliers in bronze designed by the architect. The lamps are Osram lamps of special shape. In addition, there are over 150 brackets of beaten bronze and many single pendants. The narrower galleries are lit by two-light pendants suspended over the cases, and the whole of the fixtures are arranged specially to light up the cases.

Water paint, mainly in subdued green and ivory tints, has been very largely used for the interior wall-colour effects.

The chief clerk of works was Mr. H. W. Tanner, and the general foreman was Mr. J. Farndon.

The following are some of the sub-contractors: Mack fire-resisting partition slabs, J. A. King and Co., London; stoneware pipes, etc., Leeds Fireclay Co. and Doulton and Co.; interior brick lining to walls, Sankey and Sons; cement, Associated Portland Cement Co.; electric installation, including the fixing of fittings, arc lamps, etc., T. Clarke and Co.; electric fittings, General Electric Co., Ltd., and Strode and Co.; ornamental metalwork and casements, Hart, Son, Peard and Co.; ironwork, St. Pancras Ironwork Co.; ironmongery and sliding doors, Chas. Smith, Sons and Co.; drainage, Burn Brothers; rain-water pipes, etc., W. Macfarlane and Co.; armoured fireproof doors, Mather and Platt; hydrants, Simpson and Co.; suspended ceilings and steelwork encasing, A. and J. Main, Ltd.; ornamental plasterwork, Bromsgrove Guild of Applied Arts, G. P. Bankart, J. Bickley; paint, R. Gay and Co., Ltd.; granite steps, Fenning and Co.; slates, Old Delabole Slate Co.; roof glazing, W. E. Rendle and Co.; general glazing, Pilkington Brothers; electric lifts, General Electric Co., R. Waygood and Co.; fireplaces, Shuffrey and Co.; service lifts, George Johnson; revolving doors, Van Kannell Revolving Door Co.; outside paving, Hard York Non-slip Paving Co.; marble, Farmer and Brindley, Walton, Goody and Cripps, Burke and Co.; show-cases, Gardiner, Sons and Co.; mosaic work, The Art Pavements and Decorations, Ltd.; the atmospheric steam heating system, by Jeffrey and Co.; expanded metal lathing for plasterwork, and three-inch mesh lathing for concrete reinforcement, Expanded Metal Co.; "Silex" stone for staircases, Brookes, Ltd.

The building is equipped with four hydraulic lifts, and three non-automatic basement ejectors are also supplied for various purposes. The fire service is supplied by two sets of Ellington's patent automatic injectors, which will discharge through hydrants a total of five hundred gallons of water per minute. The power for these services is supplied from the mains of the London Hydraulic Power Co.

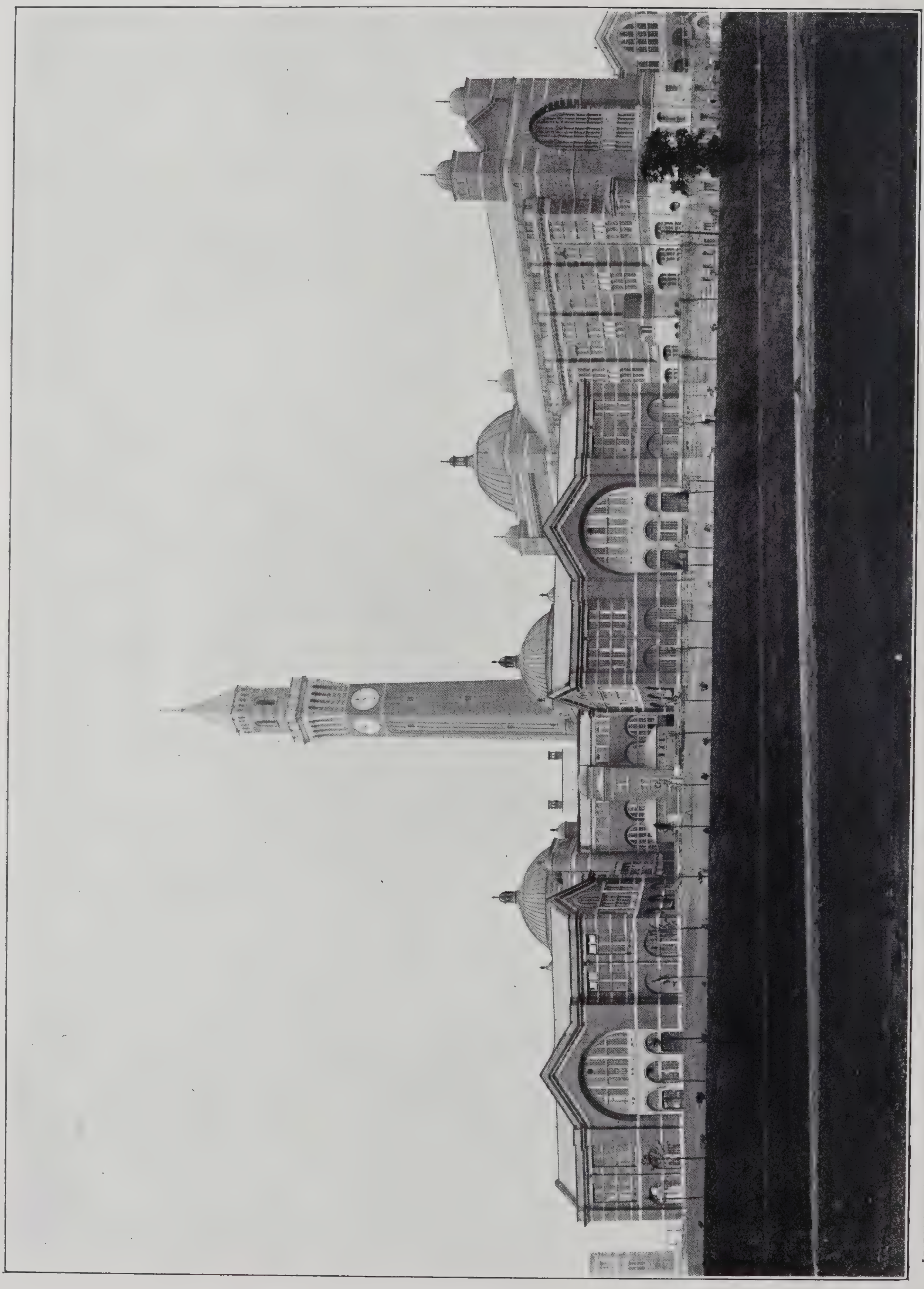


THE VICTORIA AND ALBERT MUSEUM: RANGE OF WALL CASES. SIR ASTON WEBB, C.B., R.A., F.R.I.B.A., ARCHITECT.

UNIVERSITY OF BIRMINGHAM.

Sir Aston Webb, C.B., R.A., F.R.I.B.A., and E. Ingress Bell, F.R.I.B.A., Architects.

The buildings are situated at Bournbrook, on a site of 39 acres, the gift of Lord Calthorpe, the main entrance being from University Road. In the centre of the frontage is the library, the gift of Mr. Charles Harding and family, with the Chamberlain Tower, the gift of an anonymous donor, commemorating the inception of the scheme by the Right Hon. Joseph Chamberlain. The tower forms a landmark for miles around. Facing this is the Great Hall, with the various blocks branching east and west. When completed there will be nine blocks; at present only six have been erected. Situated on the north-west portion of the site is the power-station, comprising engine and boiler-house, with steel-melting laboratories, foundry, smithy,



BIRMINGHAM UNIVERSITY: GENERAL VIEW OF BUILDINGS FROM BACK. SIR ASTON WEBB, C.B., R.A., F.R.I.B.A., AND E. INGRESS BELL, F.R.I.B.A., ARCHITECTS.

battery-house, gas plant, etc., and connected with the main building by a subway carrying the electric mains and pipes. The whole of the space formerly occupied as a rifle range, 14 acres in extent, has been laid out as a sports ground for cricket, football, hockey, and tennis.

The stone figures for the entrance are the work of H. Pegram, A.R.A. The ceramic frieze for the entrance was done by R. Anning Bell. The stone carving is the work of W. S. Frith. The general contractor for the main buildings was T. Rowbotham; the contractors for the tower were Waring & White, Ltd.; for the power station, Smith & Pitts; and for the grounds and roads, Currall Lewis, Martin.

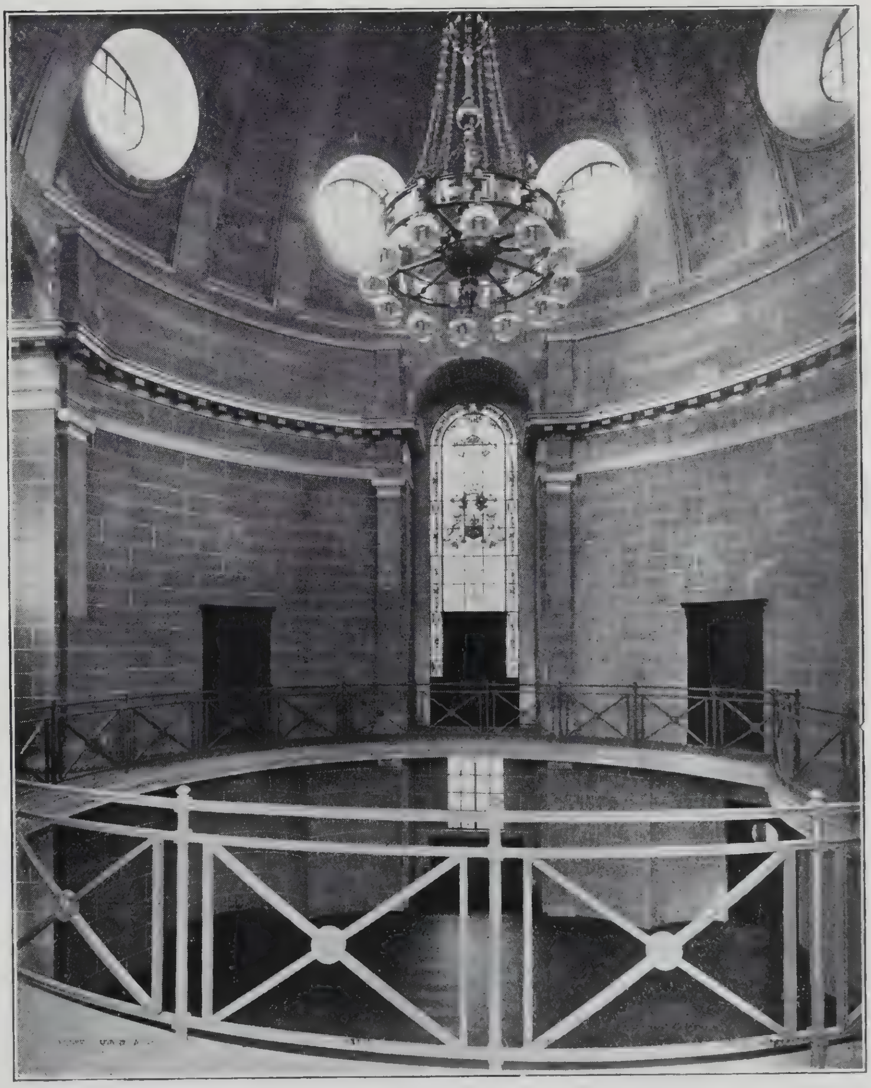
The quantity surveyors were Corderoy and Co.; surveyors for roads and grounds, Thomas and Bettridge; electrical engineers Henry Lea and Sons; experimental electrical engineer, G. A. Steinthal. The testing of steel and other materials was carried out by R. H. Harry Stanger, and the consulting engineer for the steelwork was E. L. Hall. The clerk of the works was H. Gray, and C. Lavender was foreman of the works. The following are some of the sub-contractors: Terra-cotta, Gibbs and Canning, Tamworth; asphalt, Pilkington and Co.; gates and railings, Hart, Son, Peard and Co., Ltd., and Bayliss, Jones and Bayliss. The entrance gates, by Hart, Son, Peard and Co., Ltd., are of wrought iron, with panels in cast bronze on either side showing the arms of the University. The gates are 13ft. 6in. high in the centre. The organ in the Great Hall was built by Norman and Beard, of Norwich. Facing bricks were supplied by The Accrington Brick Co.; building bricks, Hadley and Co. and Johern and Son; glazed bricks, Burmantofts Co. and the Leeds Fireclay Co.; stone (generally), the Darley Dale Stone Co.; York stone, Powson Bros.; stone granolithic paving, Stuart's Granolithic Co.; steelwork (steel construction, girders), Eastwood, Swingler, and Co., Hill and Smith, C. Wade and Co.; fireproof partitions, C. Picking and Co.; slates, the Tilberthwaite Green Slate Co., Kendal; casements and casement fittings, Henry Hope and Son; patent glazing and fittings, Henry Hope and Son; stoves, grates, mantels to architects' designs, Shuffrey and Co.; sanitary ware and fittings, Doulton and Co., W. George; marble flooring, Arthur Lee and Bros., Hayes; plasterwork (enriched), The Bromsgrove Guild; stained glass and leaded lights, T. R. Spence; art metal work (special designs), The Birmingham Guild of Handicraft, Bromsgrove Guild; electric light fixtures, The Birmingham Guild of Handicraft, Bromsgrove Guild; door furniture, Charles Smith, Sons and Co., throughout; marble-work (not floors), Arthur Lee and Bros.; lifts and cranes, Otis Elevator Co., G. Johnson (service lifts); laboratory fittings, benches, tables, etc., T. Rowbotham: clocks, clock bells, etc.; Joyce and Co. (clock), Taylor and Son (clock bells); special furnishings, Lucy and Co. (book fittings), Brown and Co. (laboratory fittings, i.e., taps, etc.), Hampton and Sons, W. Harris, Harris and Sheldon, Chamberlain, King and Jones, Lee, Longland and Co.; pavement lights, St. Pancras Ironworks Co., Ltd.; cement, Associated Portland Cement Manufacturers, Ltd., Greaves, Bull and Lakin; lime, Buxton Lime Co., J. Board and Co.

THE ASHTON MEMORIAL, LANCASTER. John Belcher, R.A., Architect.

A finer site could hardly be imagined than that chosen by the Right Hon. Baron Ashton for the memorial to his family. An outlook is obtained from the building far and wide over the country and adjacent coast line. Flights of steps lead to the terrace of the building, which is 70ft. above the park level. Carriage drives approach the steps from several directions.

The lower hall, which is 43ft. in height and diameter, is raised above the terrace by a few steps, and is approached through open loggias. Large arched openings with glazed screens give access immediately into the hall, which is lighted through these screens.

An octagonal dome covering in this hall is constructed of steel and concrete, and is being painted in fresco by Mr. George Murray, with subjects representing "The Arts," "Commerce," "Science," and "History." Piastraccia, Rosso Antico, and Tinos marbles, in a geometrical pattern, form the floor, which has brass grilles worked into the design to allow of the passage of heated air from the heating apparatus below. The floor was executed by Anthony Bell and Sons, of Lancaster, and the same firm also carried out the Cornish granite steps, approaches, and balustrades, and all the ornamental and other ironwork, including the staircases and brass handrails. The structural steelwork was made by Edward Wood and Co., Ltd. Two staircases in the angle turrets lead to the upper gallery or outlook, and to the main chamber, from which a more extensive view can be obtained. Another staircase leads from this hall to galleries, one at the base of the peristyle of the dome, and the higher one over the entablature. On this upper gallery are placed groups of statutary representinog "Commerce," "Science," and "Industry," by Mr. Herbert Hampton. The upper part of the drum of the dome is pierced by eight openings, which light the cupola over the main hall, which is all finished with stuc plaster with white joints. The whole of the stuc work was carried out by Geo. Trollope and Sons and Colls and Sons, Ltd., London, with British workmen entirely. From the terrace to the belvedere is 118ft., and to the top of the vane from the ground below the stairways 220ft. A sheet of water is enclosed by the winding flights of steps, and the niche under the landing is designed to accommodate a fountain group. Drinking fountains are placed at the foot of the turrets. The large electrolier seen in the interior view, and other electric fittings, were made by Veritys, Ltd.

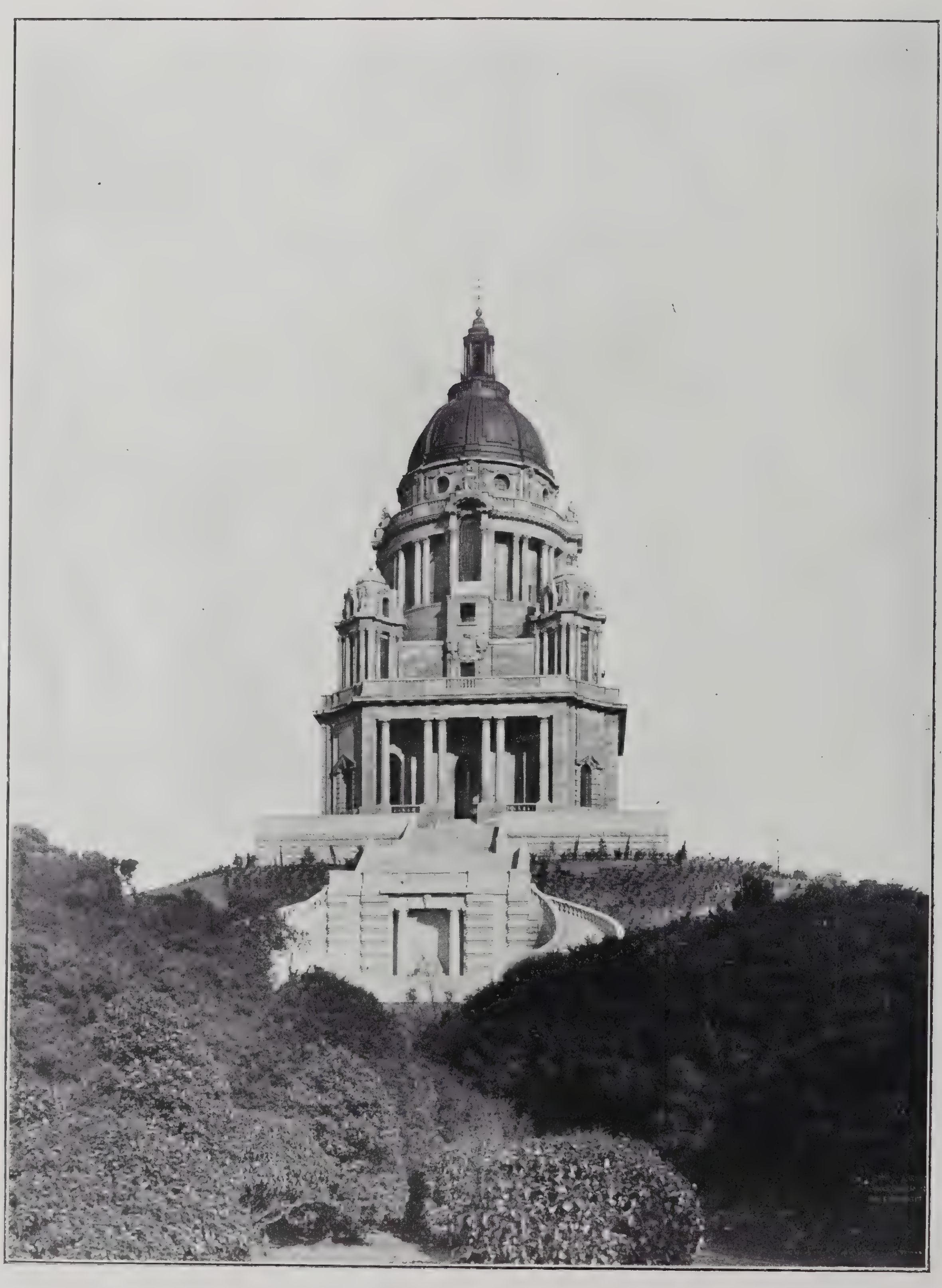


THE ASHTON MEMORIAL, LANCASTER: DETAIL OF INTERIOR FROM THE GALLERY.
JOHN BELCHER, R.A., F.R.I.B.A., ARCHITECT. *(For elevation, see next page.)*

The lower hall is to be used as a museum, while the upper will be a lounge and reading-room.

Portland stone has been used for the main building. The steps, approaches, etc., are built of grey Cornish granite. Robin Hood, Greenmoor, and Hopton Wood stone have all been employed as paving and steps.

Among the other sub-contractors were James Freeman, Sons and Co., Ltd., Penryn, who supplied the Cornish granite; H. H. Martyn and Co., Ltd., Cheltenham, who executed the carving; Henry Hope and Sons, Ltd., Birmingham, who supplied the metal casements; and W. Richardson and Co., Darlington, who installed the heating system. The Waring and White Building Co., Ltd., were the general contractors, and Mr. Thomas Gamage was clerk of the works.



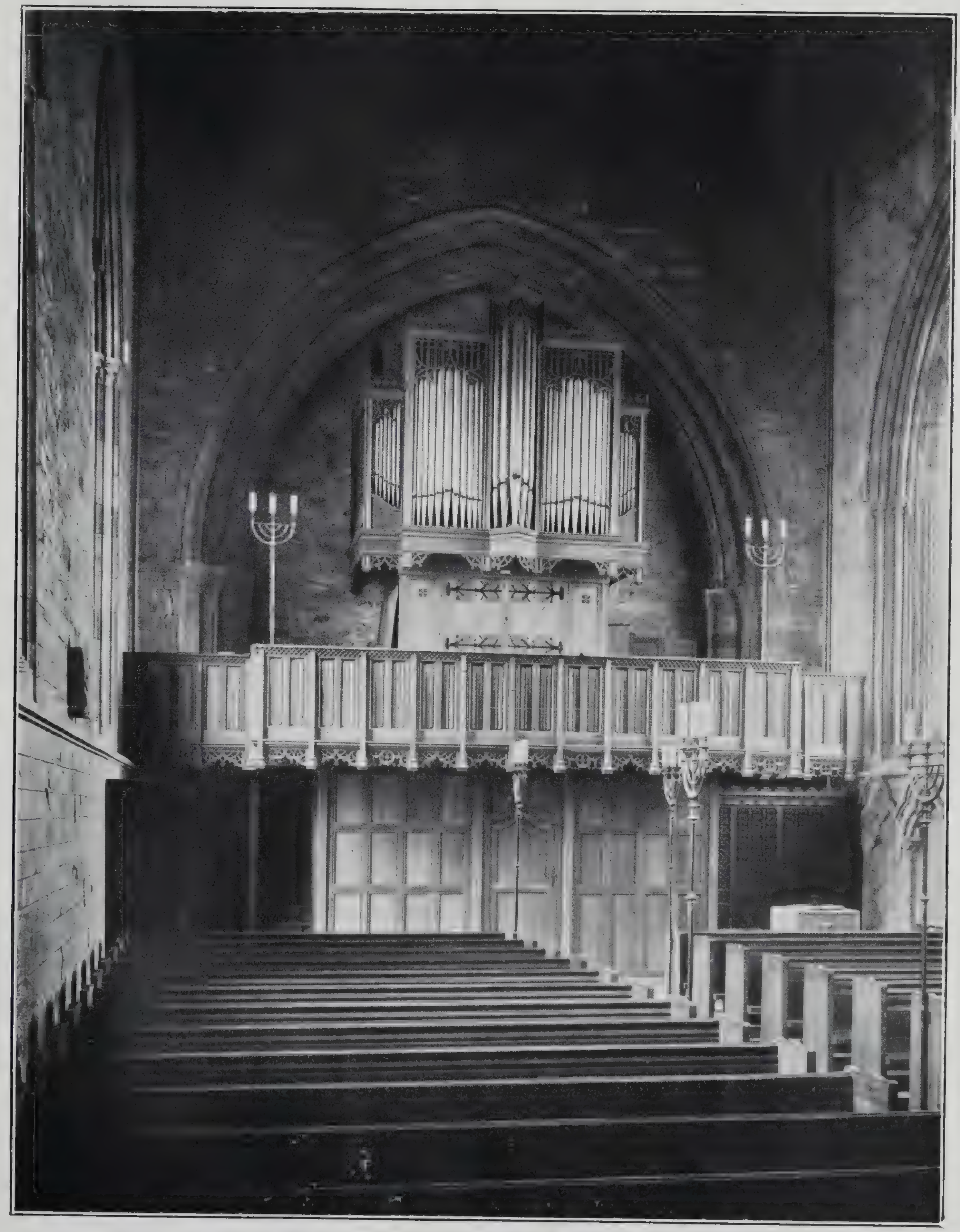
THE ASHTON MEMORIAL, LANCASTER. JOHN BELCHER, R.A., F.R.I.B.A., ARCHITECT.

DUNKELD CATHEDRAL RESTORATION.

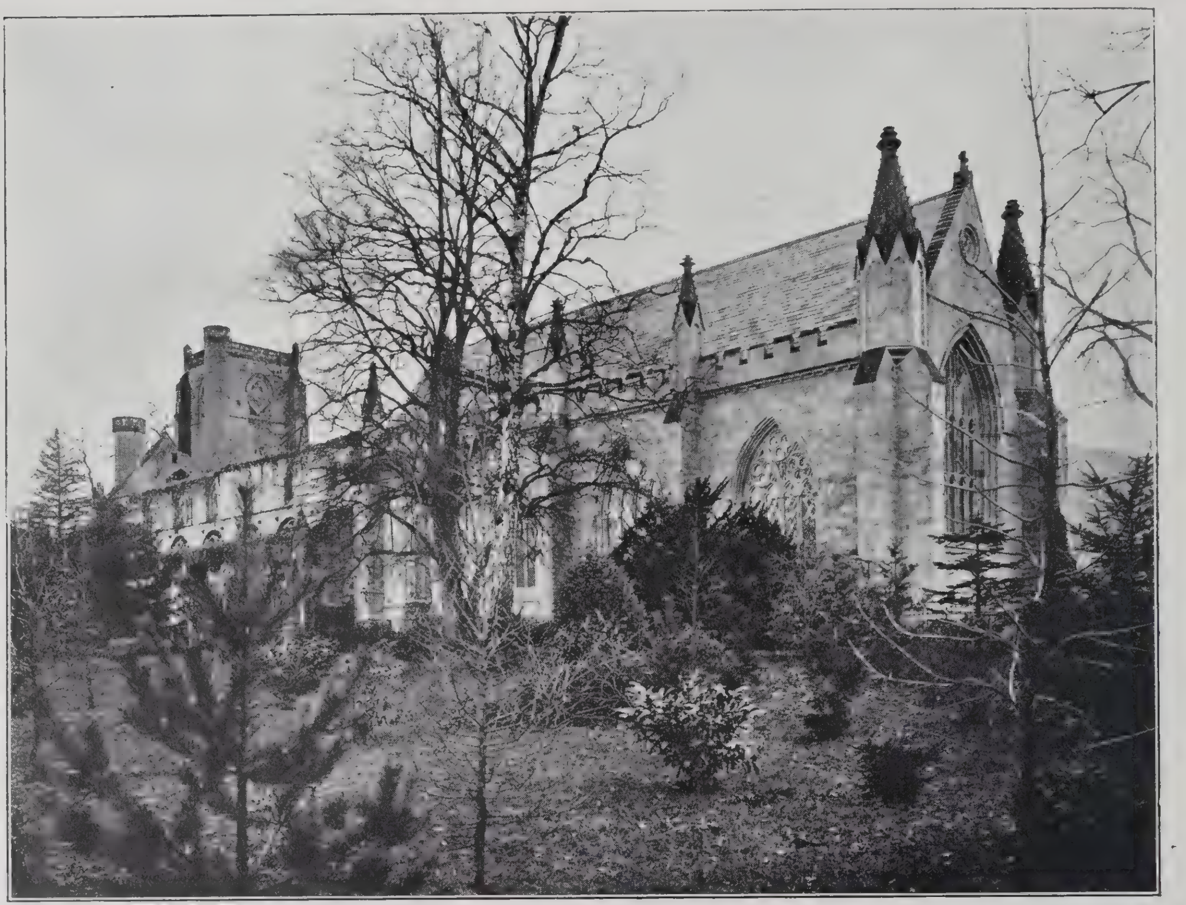
W. Dunn and R. Watson, FF.R.I.B.A., Architects.

When the choir of Dunkeld Cathedral was repaired in 1820, a new roof was added at a lower level than the original roof, and it fitted in a clumsy way against the east gable. It was finished on the inside with hideous plaster vaulting, jointed and coloured to represent stone. This vault comparatively low, and entirely destroyed he lofty proportion which must originally have belonged to the interior. At the same time, shortening the choir, a thick wall was built parallel to the east end. On his and the west walls galleries were erected, and the smaller area was filled with box pews. Recently it was found hat many of the old roof timbers were decayed so badly as to be beyond repair, and it was decided that a new roof was necessary. The late Sir Donald Currie thereupon offered to bear the whole expense of putting on a new roof, removing partition walls and galleries, and reseating the choir.

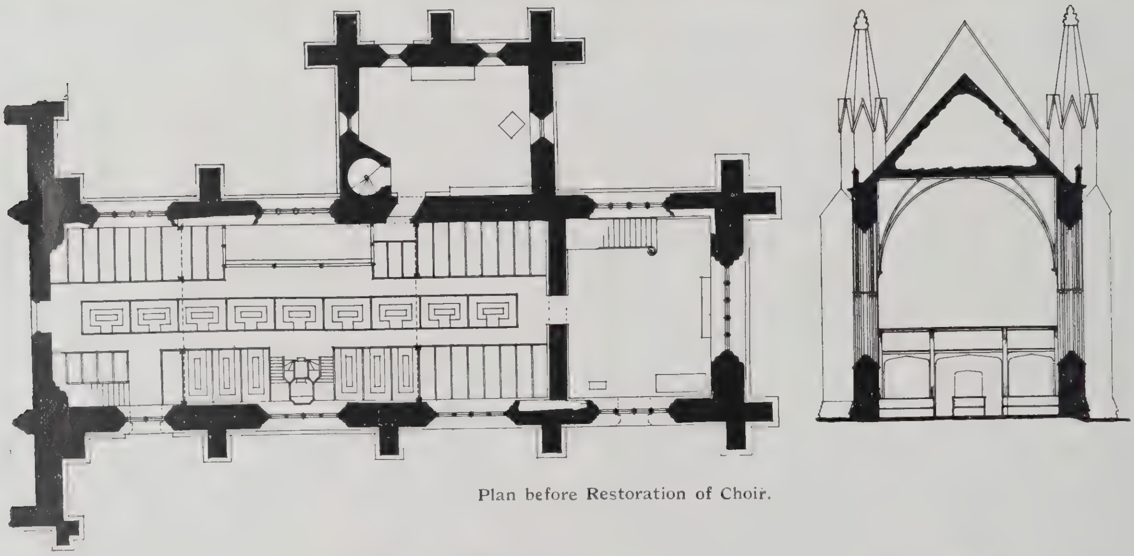
Nothing is known as to the form of the original roof, and the architects had only the outline of its pitch, shown against the gable, to guide them. This has been accepted, and the new roof has been built to the same slope. Its construction is interesting, the tie being placed high up to allow of the lofty proportion of the building being preserved. Of restoration beyond this there is little—removing plaster to expose beautiful walls or rubble or ashlar masonry, eking out damaged window jambs, filling up dowel holes. A few small additions in the way of furnishings have been fitted up—an oaken pulpit, oak screen, and communion table towards the east, with an ambulatory, and at the west a small gallery for the organ and choir, with a vestry underneath. The passages and the main body of the church are paved with old stones, but an oak woodblock floor was placed under the new pews, and a heating system has been installed. The Bromsgrove Guild were among the sub-contractors.



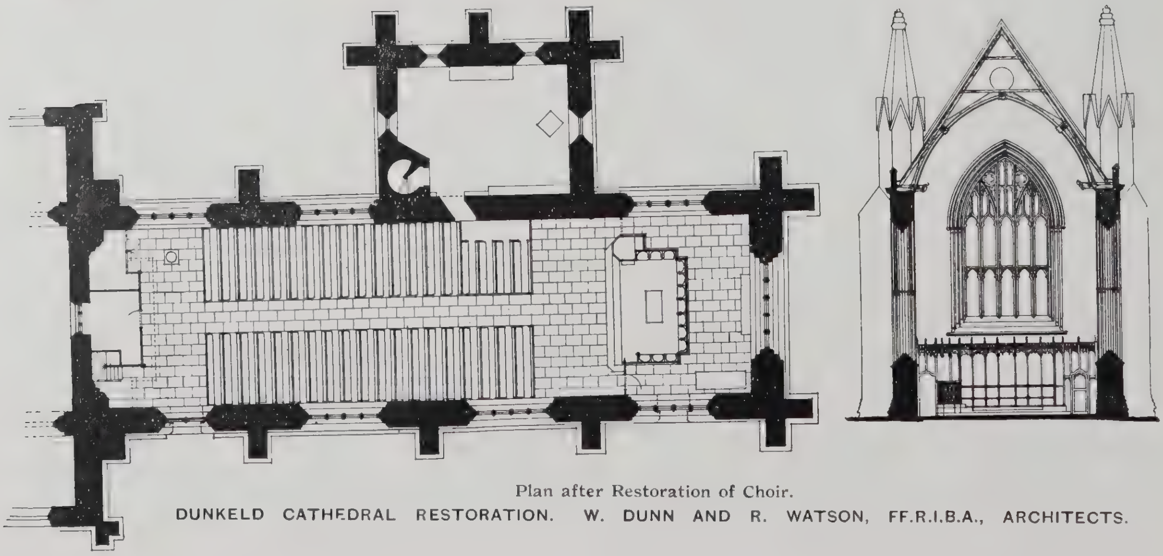
DUNKELD CATHEDRAL. WEST END OF CHOIR. W. DUNN AND R. WATSON, FF.R.I.B.A., ARCHITECTS.



DUNKELD CATHEDRAL: GENERAL VIEW FROM THE SOUTH-EAST.



Plan before Restoration of Choir.



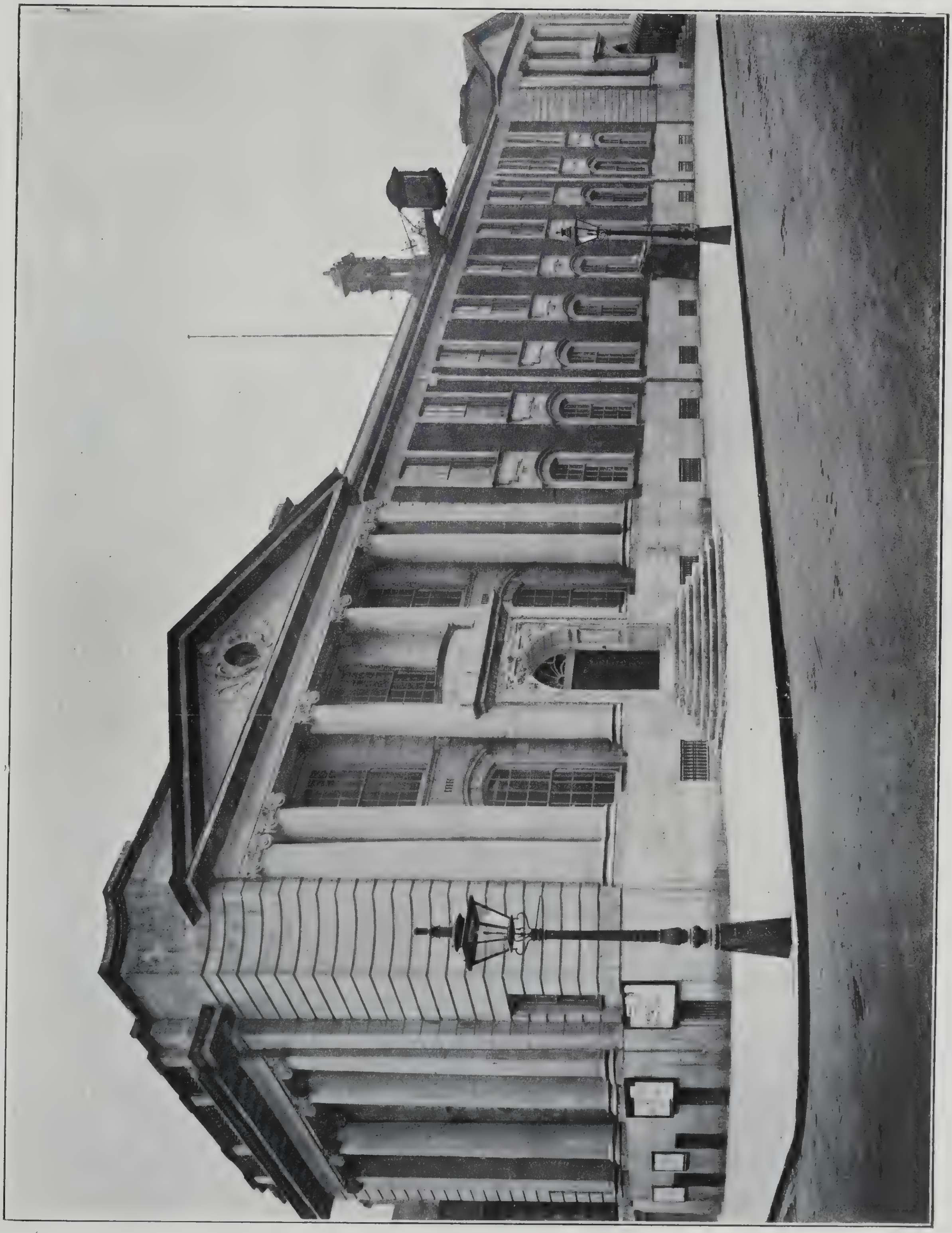
Plan after Restoration of Choir.

DUNKELD CATHEDRAL RESTORATION. W. DUNN AND R. WATSON, FF.R.I.B.A., ARCHITECTS.

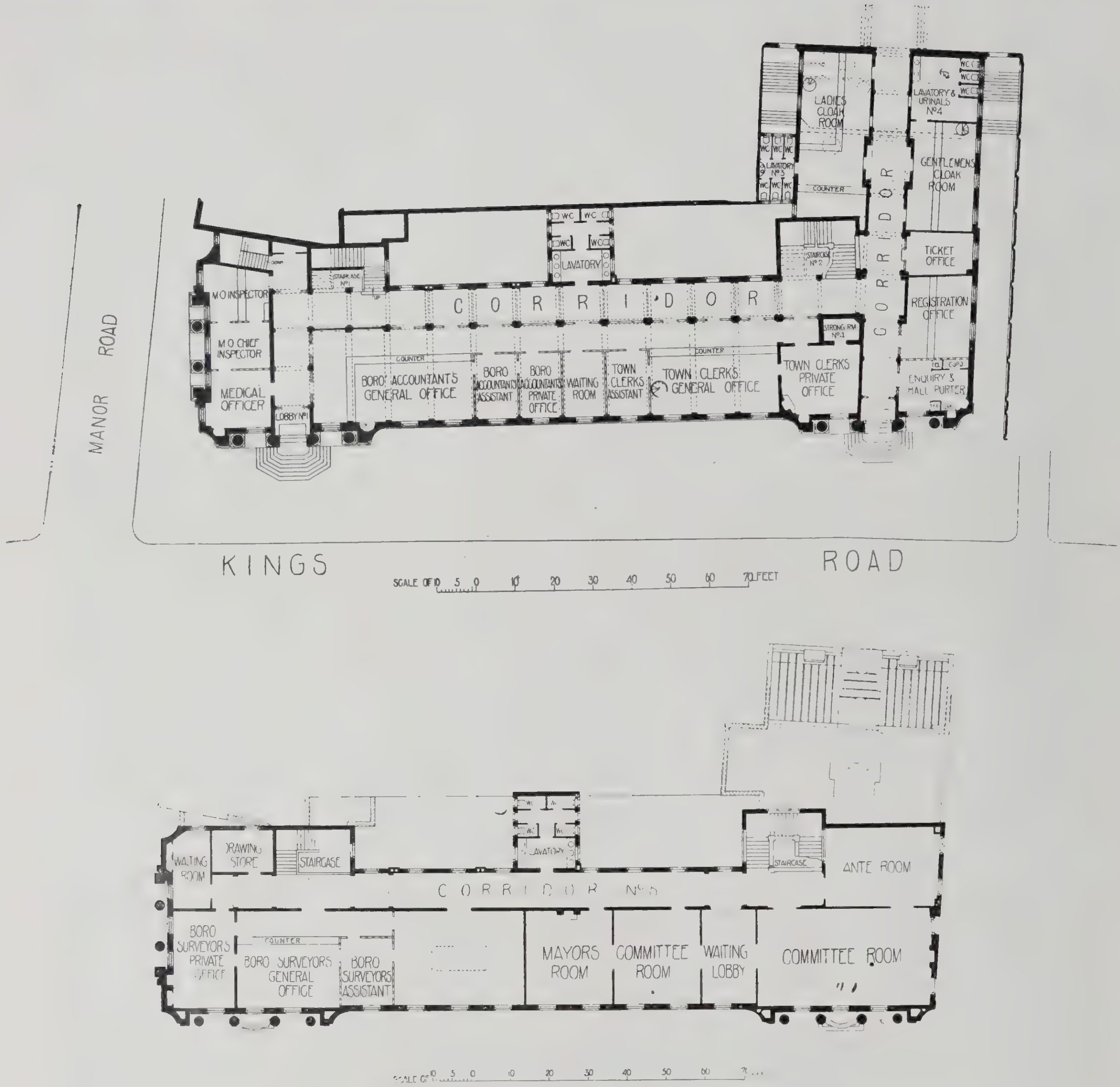
CHELSEA TOWN HALL EXTENSION. Leonard Stokes, F.R.I.B.A., Architect.

This building has been erected on the site of the old vestry offices and of the former entrance to the public baths in King's Road, Chelsea. It provides accommodation for the Council's officials. The existing Town Hall, to which this building is an addition, was erected from the designs of the late J. M. Brydon, and, as fas as practicable, the general detail of his work has been followed. The building is of brick, faced on the King's Road and Manor Street elevations with Portland stone and Cornish granite.

A large number of "Mack" partitions have been used, and the roofs have steel principals, and Mack slabs upon which the battening and slating are laid. The internal joinery is throughout of American walnut. The balustrading to the staircases is of polished Hopton Wood stone. The general contractor is A. N. Coles, of Plymouth. The carving is by A. Broadbent, Fulham. A. G. Cross, F.S.I., was the quantity surveyor employed by the Borough Council. The following are some of the sub-contractors: Portland stone, Williams and Co., Chelsea Bridge; fire-proofing construction, D. G. Somerville and Co., Westminster; "Mack" partitions and slabs, J. A. King and Co.; wall tiling, mosaic work, marble, Martin van Straaten and Co., London, E.C.; electric glazing, the British Luxfer Prism Syndicate, Finsbury; stoves and grates, gates and railings, Thos. Elsley, Ltd., London, W.; sanitary fittings, J. Bolding and Sons, Ltd., London, N.W.; electric light fixtures, Wright Bros., Chelsea; door furniture, N. F. Ramsay and Co., Westminster; electric wiring, the Electric and General Engineering Company, London, E.C.; heating and ventilating installations, James Gray, Chelsea; clock works and bell, Gillett and Johnston, Croydon; strong-room doors, Ratner Safe Co., London, E.C. ornamental iron grilles, the Falkirk Iron Co., London, E.C.; telephones, the National Telephone Company, Ltd.



CHELSEA TOWN HALL EXTENSION: GENERAL VIEW. LEONARD STOKES, F.R.I.B.A., ARCHITECT.



CHELSEA TOWN HALL EXTENSION: PLANS. LEONARD STOKES, F.R.I.B.A., ARCHITECT.

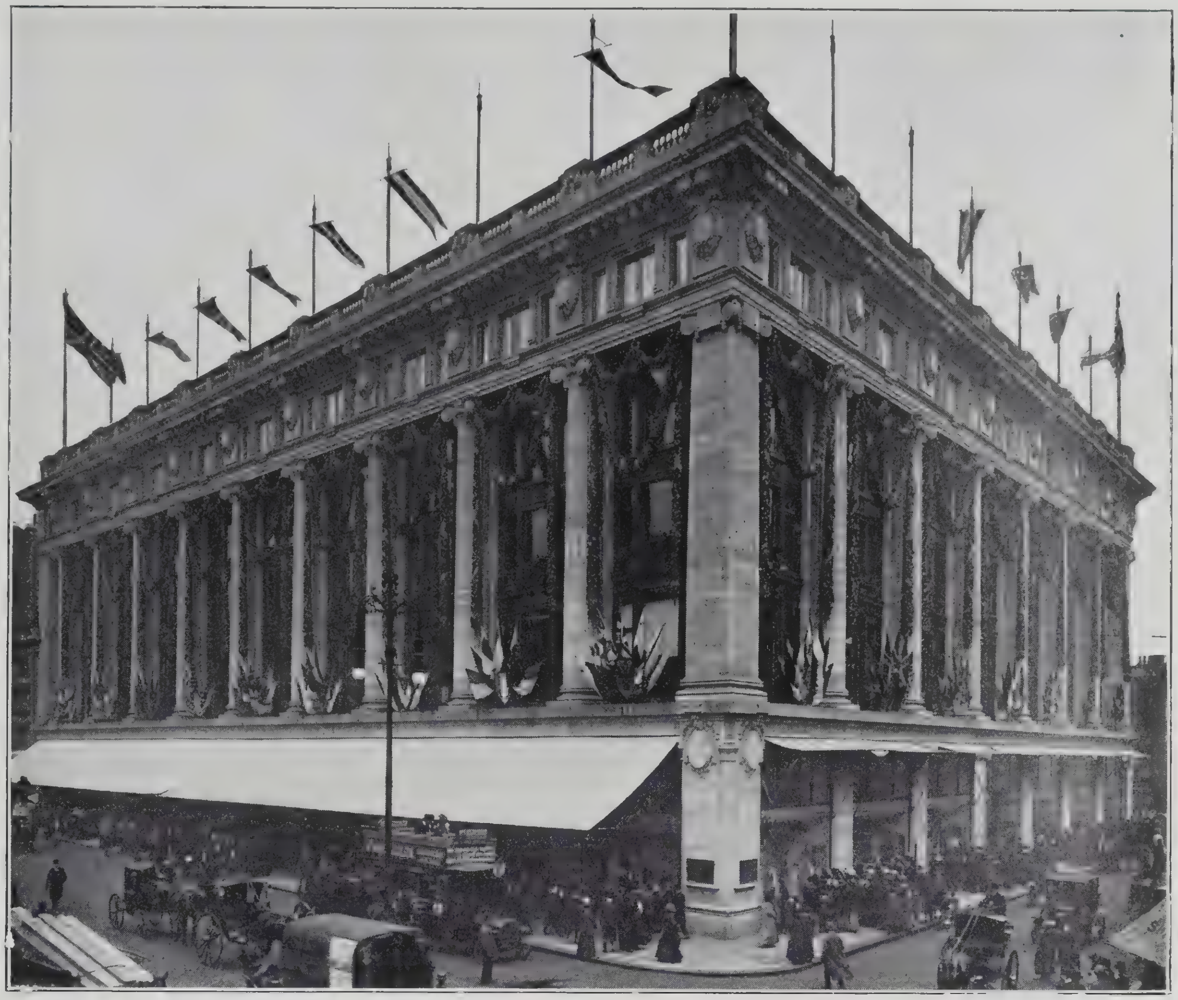
THE SELFRIDGE STORE, LONDON. R. Frank Atkinson, F.R.I.B.A., Architect.

A new scale has been given to the architecture of Oxford Street by the addition of the Selfridge Store. Its general conception is simple. Over the ground floor a giant colonnade is ranged, carrying a heavy cornice with a balustrading. Somewhat new in this country is the arrangement of the windows to the three floors embraced by the order. These are contained in cast-iron frames, designed to interfere with the light as little as possible. Cast-iron window frames are also used on the ground floor.

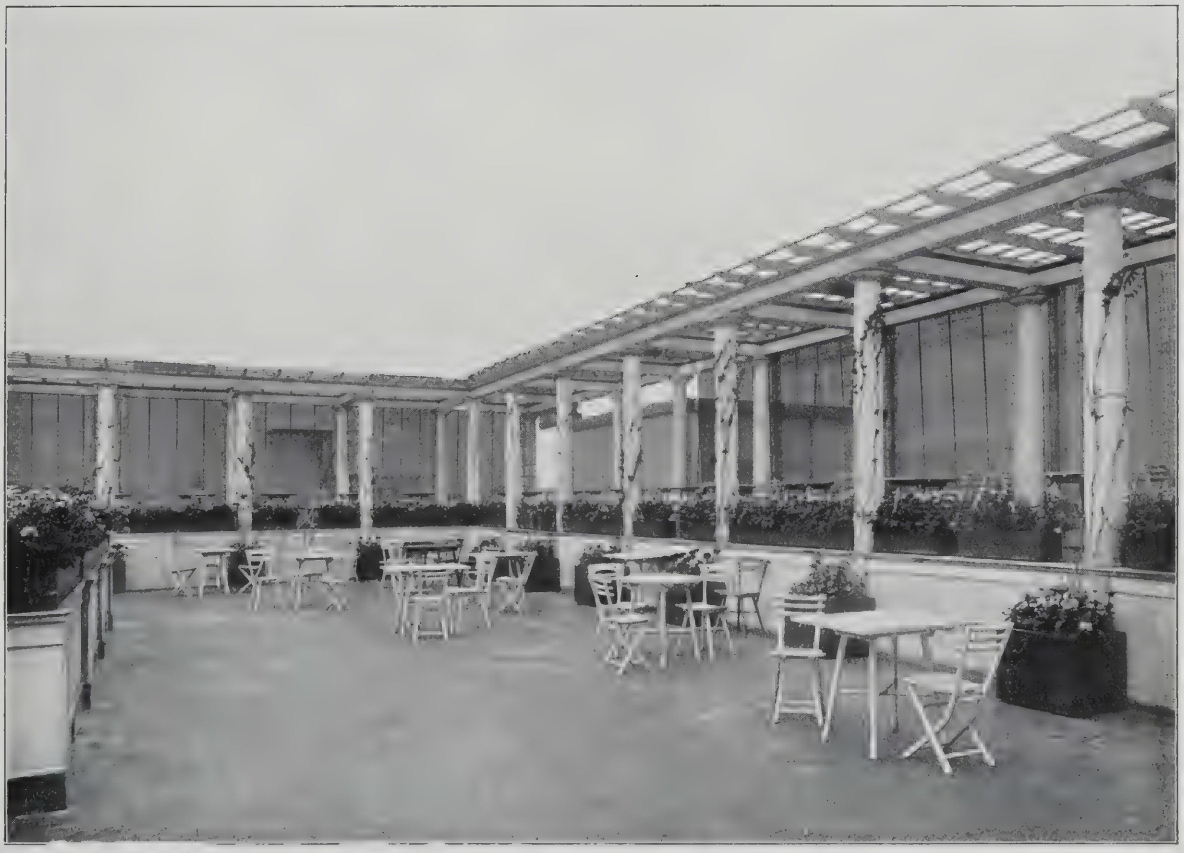
There are three basements, the lowest of which accommodates the heating, electric light, artesian well, motor rooms, etc. Storerooms for various departments occupy the sub-basement, while staff and dispatch accommodation is provided on the basement along with space for sale purposes. Sale rooms occupy the first four floors. Besides these the third floor has reception rooms, National rooms, post office, rail and steamship ticket office, and booking office for theatres, etc.

A restaurant is placed on the fourth floor with kitchen and offices, etc., and a roof garden is arranged over it. Nine passenger and two goods lifts, as well as six staircases, serve the building. The lifts are worked by electricity. A novel labour-saving apparatus is the gravity package conveyor for carrying parcels to the dispatch room in the basement.

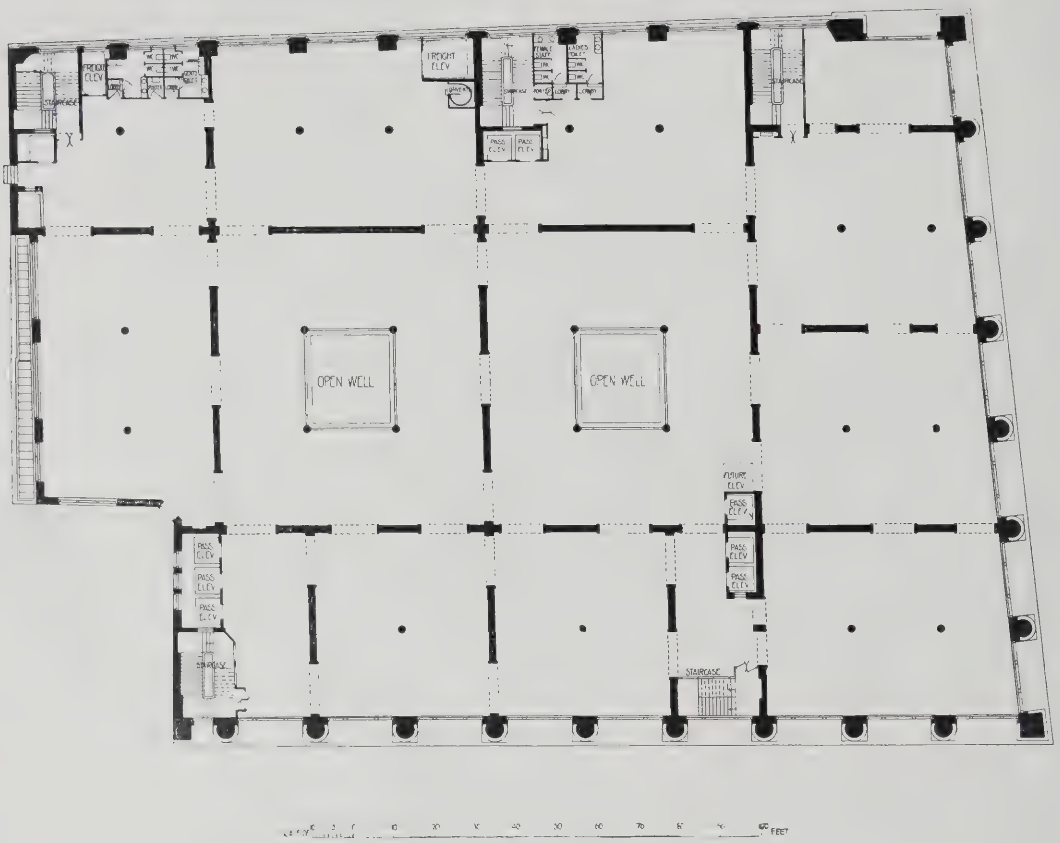
Portland stone was used as the facing, and the whole building is of fireproof construction. The general contractors were Waring and White, Ltd. Asphalt work—some 180,000 sq. ft.—was done by Thomas Faldo and Co., Portland stone work by the Bath Stone Firms, Ltd., and F. J. Barnes, while the carving was executed by W. B. Fagan and W. Arrowsmith from models supplied by J. Else. Shanks and Co., Ltd., of Barrhead, Glasgow, supplied the sanitary fittings. The mosaic and marble flooring was done by Diespeker, Ltd. Malcolm and Allen, of Eglington Street, Glasgow, did the electric wiring. Veronese, Ltd., of Fulham, made and supplied between six and seven miles of 30-in. girt cornice in the short space of twelve weeks. This was fixed by Messrs. Henry Johnson and Sons, of London, and Liverpool, who also supplied 3,600ft. of same. This firm also executed the reinforced concrete staircases and plastering work. The plastering comprised about 5 acres of ceiling and 5½ acres of wall plastering. The whole of this work was carried out and completed in four months. The cast-iron work supplied by Messrs. Walter Macfarlane and Company, Saracen Foundry, Glasgow, comprises the shop windows and entrances on ground floor, and the entire bays, mentioned above, between the massive Portland stone columns from the first to the fourth floor. The feature of the shop windows is the very large polished plates which are possible by this method. Some of these are 19ft. 4in. long by 12ft. high. Spital and Clark carried out the art metal work, railings, handrails, etc., and provided some of the electric light fittings. Veritys, Ltd., also supplied some of these, as well as all the gas fixtures. The door furniture and



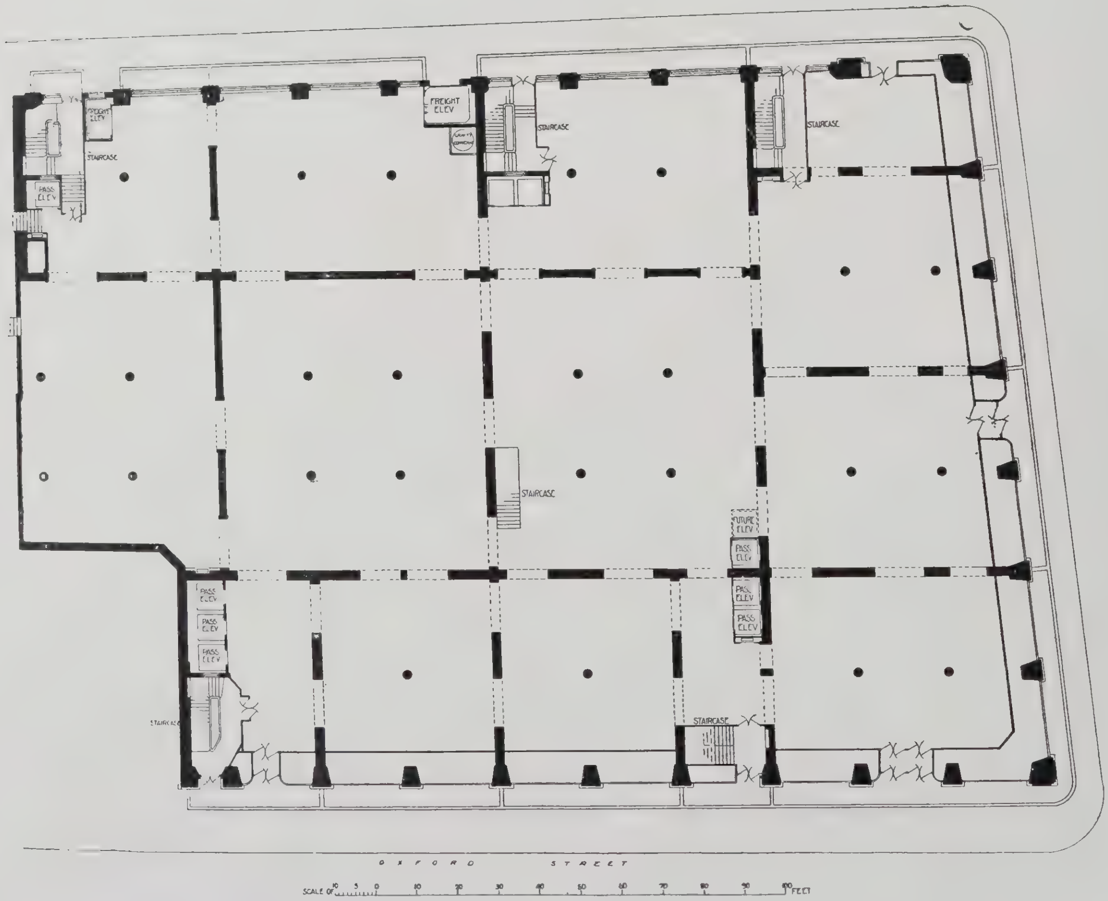
THE SELFRIDGE STORE, LONDON: GENERAL VIEW. R. FRANK ATKINSON, F.R.I.B.A., ARCHITECT.



THE SELFRIDGE STORE, LONDON: THE ROOF GARDEN. R. FRANK ATKINSON, F.R.I.B.A., ARCHITECT.



First Floor Plan.



Ground Floor Plan.

THE SELFRIDGE STORE, LONDON: PLANS. R. FRANK ATKINSON, ARCHITECT.

locks were supplied by Yale and Towne. Allen and Co. also made some of the railings, balusters, etc. The door openings in the division brick walls are generally 12ft. by 12ft., and are equipped with automatic steel rolling shutters of the Kinnear patent supplied by Arthur L. Gibson and Co. About 470 shutters have been erected.

Passenger and goods lifts were done by the Otis Elevator Company. Grinnell system of sprinklers was installed by Mather and Platt, Ltd.; the iron party wall doors were supplied by the St. Pancras Ironwork Co., Ltd. A vacuum cleaner and two sets of Ellington's patent automatic injectors are worked from power supplied by the London Hydraulic Power Company.

CENTRAL FREE LIBRARY, NELSON, LANCS.

J. Rigby Poyser and W. Brandreth Savidge, Architects.

This building is situated at the junction of Carr Road and Bootle Street. The site is a very restricted one for the accommodation required, which had to be confined as far as possible to the ground floor. The building externally is faced with rubbed Keighley and Catlow stone. The roofs are covered with Arfon green slates, with the exception of the roof over the hall, which is of concrete and steel covered with asphalt. The interior woodwork generally is in Danzig oak, as well as all furniture and fittings. The general contractor was Mr. T. E. Sugden, Keighley, and the following are some of the sub-contractors: Stone carvings, H. H. Martyn and Co., Cheltenham. Arfon green slates, W. Thornton, Bingley. Casements and fittings, Williams Bros. and Co., Chester. Patent glazing, W. H. Heywood and Co., Huddersfield. Stone, etc., Standard Range and Foundry Co. Sanitary ware and fittings, W. E. Farrer, Birmingham. Mosaic flooring, Diespeker and Co. Electric wiring, Carter and Co., Nelson. Modelled plasterwork, the St. George's Guild. Stained glass, Williams Bros. and Co., Chester, and Mr. R. Bennett, Manchester. Electric light fixtures, the General Electric Co., Manchester. Door furniture, James Gibbons, Wolverhampton. Gates, railings, etc., Jones and Willis, and the St. George's Guild. Stair treads, Patent Victoria Stone Co., Ltd. Heating and ventilating, James Stott and Co., Oldham. Special furnishings, Jas. Garvie and Son, Aberdeen. Ordinary furnishing, J. Wood and Co., Harrogate.

THE EDINBURGH LIFE ASSURANCE CO.'S NEW HEAD OFFICE.

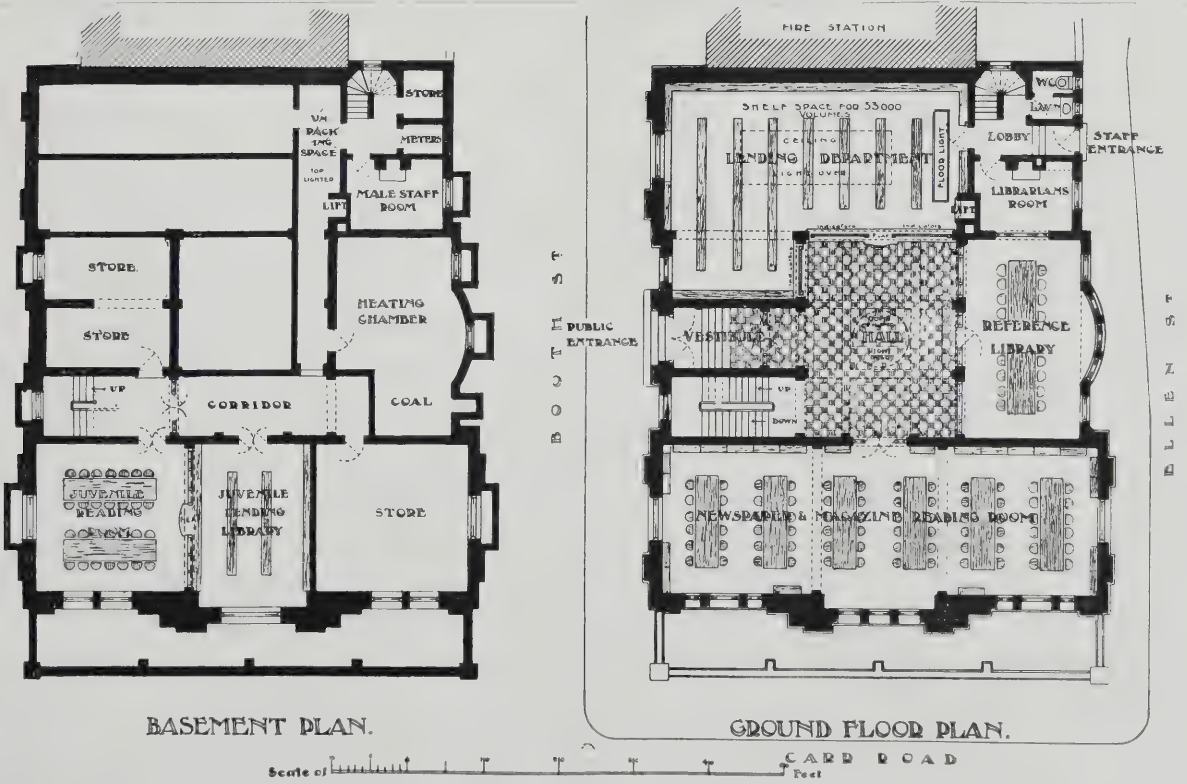
J. M. Dick Peddie, Architect.

The façades of this building, which is situated at the south-east corner of George and Hanover Streets, are built of Portland stone, with the exception of the base course, which is of Norwegian granite. Messrs. Percy Portsmouth and H. S. Gamley, AA.R.S.A., were the sculptors employed, the former doing the figure of "Prudence" on the dome, and the latter the carving on the façades. Offices for the company are provided on the ground and part of the first floor and basement, while the remainder of the building is divided into chambers.

Reinforced concrete was used in the construction of the floors, which are finished with flooring-boards on shallow joists, except in the public office and basement, where doloment is laid on the concrete. Black and white rubber flooring has also been used in the entrance hall. Panels of rose numidian, separated by bands of pavonazzo marble, are used to finish the walls of the vestibule, and the columns in the public office are made of the latter marble with gilded caps.

The strong-rooms are equipped with Estler's patent fire-resisting and space-saving steel shelving.

The building is heated on the "Barker" patent system, and the public office has a special arrangement for extracting air; the incoming air is passed through an ozone-generating apparatus. The following were the principal contractors: Mason work, R. Thorburn and Son, Edinburgh. Joiner work, J. Lownie and Son, Edinburgh. Plumber work, Burn and Baillie, Edinburgh. Plaster work, David Fisher, Edinburgh. Glazier work, Dickson and Walker, Edinburgh. Heating, Mackenzie and Moncur, Edinburgh. Painting, Geo. Dobie and Son, Edinburgh. Marble work, Allan and Son, Edinburgh. Marble columns in public office, Galbraith and Winton, Glasgow. Electric lighting, Middleton and Townsend, Edinburgh (Mr. Norman A. Thomson, Edinburgh, consulting engineer). Electric fittings, Singer and Son, Frome; Grey and Son, Edinburgh. Lifts, Smith, Major, and Stevens, Ltd., London. Lift enclosure, Mackenzie and Moncur, Edinburgh. Grates, Gray and Son, Edinburgh; Fraser Walker and Co., Edinburgh. Furniture and furnishings, J. and T. Scott, Edinburgh.



BASEMENT PLAN.

GROUND FLOOR PLAN.

CENTRAL FREE LIBRARY, NELSON, LANCS. JOHN R. POYSER AND W. BRANDRETH SAVIDGE, A.R.I.B.A., ARCHITECTS.

(For Elevation see next page.)

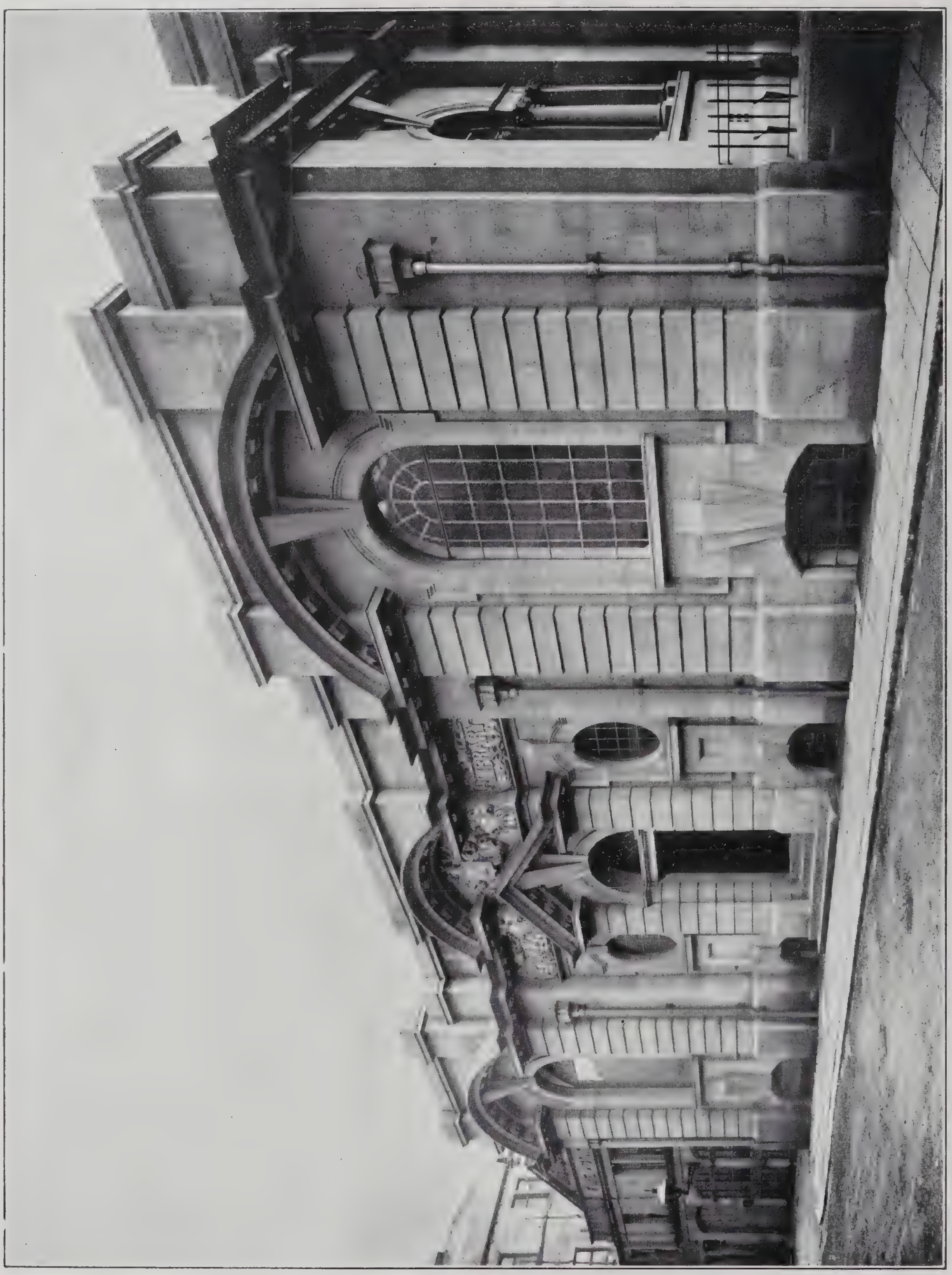
ADDITIONS TO GLASGOW CENTRAL STATION HOTEL.

James Miller, A.R.S.A., F.R.I.B.A., Architect.

The additions recently made to the Central Station Hotel consist of a large new dining saloon, billiard-room, and lounge, together with 120 bedrooms and suite rooms. The three large apartments are situated on the first floor.

The dining saloon is 105ft. long by 48ft. wide and 30ft. high, and is panelled in Italian walnut to the height of 14ft., the carving being in lime tree. The walls above are panelled in Keene's cement with carton pierre ornament, the ceiling being finished in fibre plaster. The main columns are of pavonazzo marble with the exception of the two at musicians' gallery at end of dining saloon, shown in photograph, which are of Greek cipollino. The fender shown in one of the fireplaces in the dining saloon is not the permanent one.

The lounge is elliptical in shape, the shape being determined by the outline of buildings underneath, which are occupied as offices in connection with the station accommodation. This apartment is 66ft. long by 27ft. wide, and is panelled its full height in Austrian oak. The ceiling is of fibre plaster. The small quadrant of a circle which forms part of the lounge in the angle existed previous to these altera-



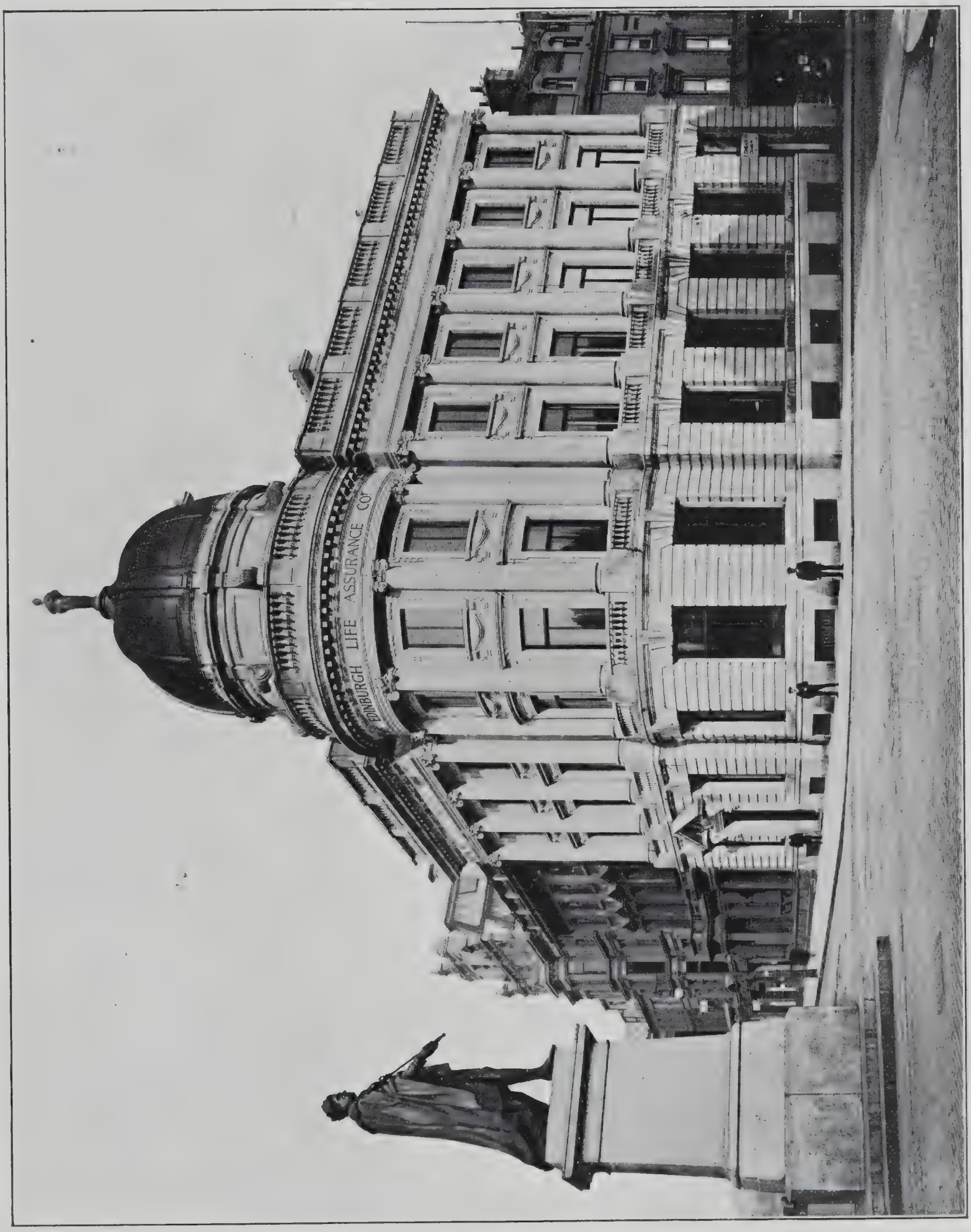
CENTRAL FREE LIBRARY, NELSON. JOHN R. POYSER, AND W. BRANDRETH SAVIDGE, A.R.I.B.A., ARCHITECTS.

tions, but its external finishings were renewed to correspond with the new lounge. The floor of the lounge is executed in coloured marbles.

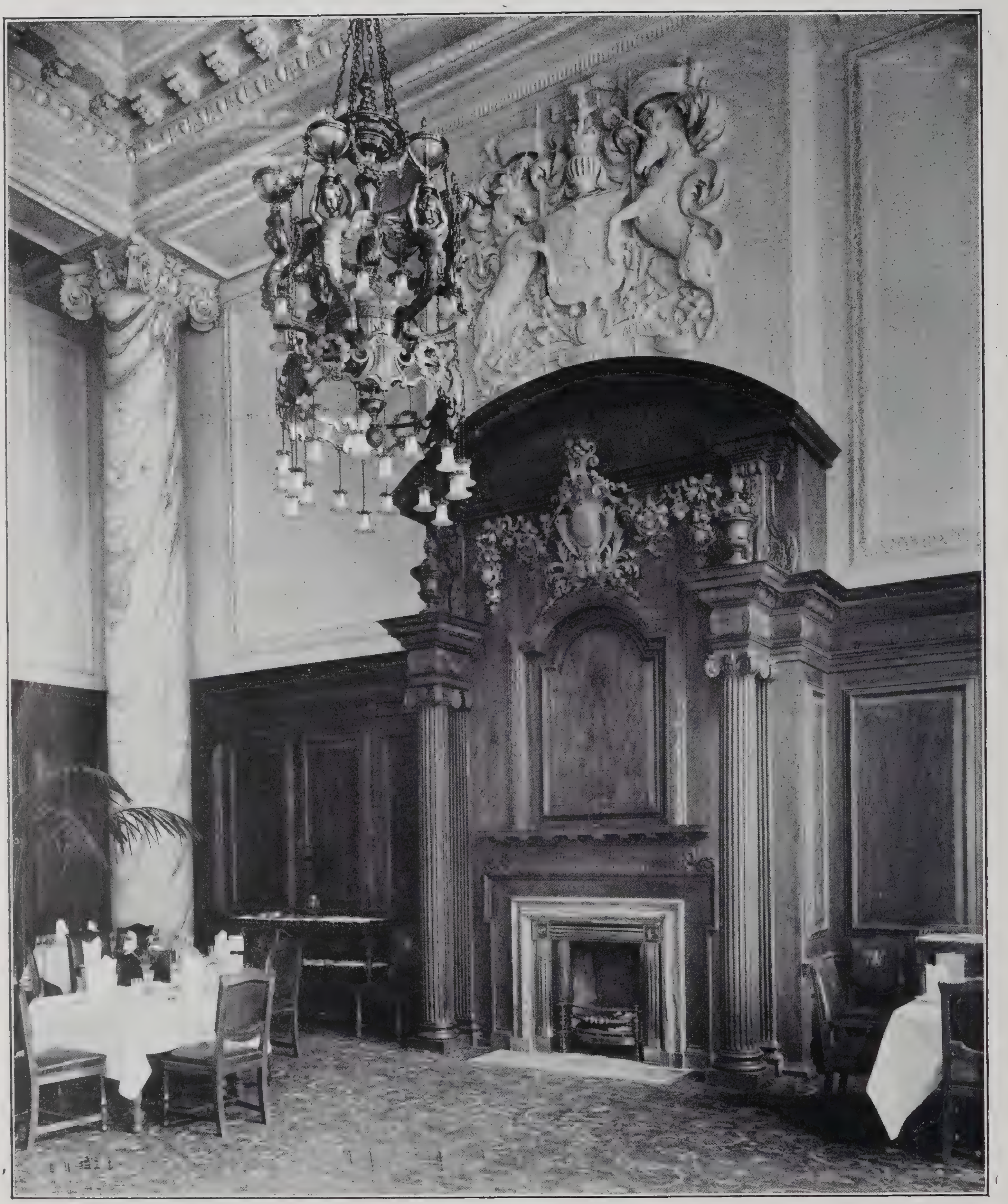
The wood-carving of lounge and dining saloon was executed by Messrs. H. H Martyn and Co., Cheltenham.

The fibre plasterwork in lounge was executed by the Bromsgrove Guild, and the ornamental work of plaster ceiling in dining saloon was executed by Messrs. George Jackson and Sons, London.

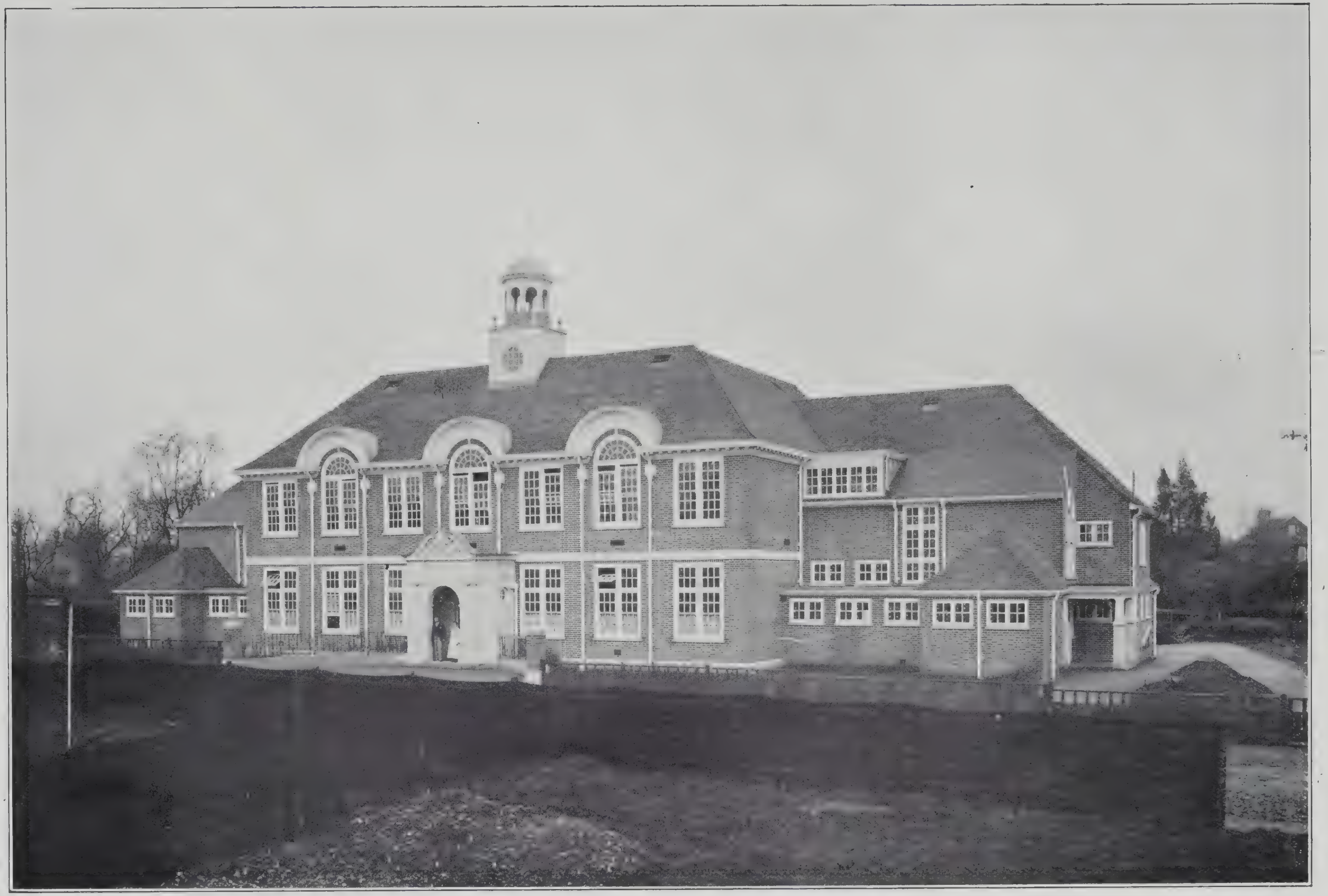
The contractors for the whole works were Messrs. P. and W. Anderson, Glasgow, and the following were their subcontractors: Joiner work, Mr. John Cochrane, Glasgow. Plumber work, Mr. Wm. Anderson, Glasgow. Plasterwork, Messrs. McGilvray and Ferris, Glasgow. Slater work, John Anderson, Glasgow. Painter work, Messrs. C. Carlton and Son, Glasgow, and Messrs. John Orr and Sons, Glasgow, Steel casements, Messrs. H. Hope and Sons, Birmingham. Marble work, Messrs. Galbraith and Winton, Glasgow. Tile work Messrs. Haddow, Forbes and Co., Glasgow. Heating and ventilating, Messrs. Ashwell and Nesbit, Ltd., Glasgow and Leicester. The glass work of cupola in lounge was executed by Messrs. Oscar Paterson and Co., Glasgow. The buildings are of steel construction throughout, the contractors for the steelwork being the Motherwell Roof and Bridge Co. The sanitary fittings throughout the building were supplied by Messrs. Doulton and Co. and Messrs. Shanks and Co. Architect, Mr. James Miller, A.R.S.A., 15, Blytheswood Square, Glasgow.



THE EDINBURGH LIFE ASSURANCE BUILDING. J. M. DICK PEDDIE, ARCHITECT.



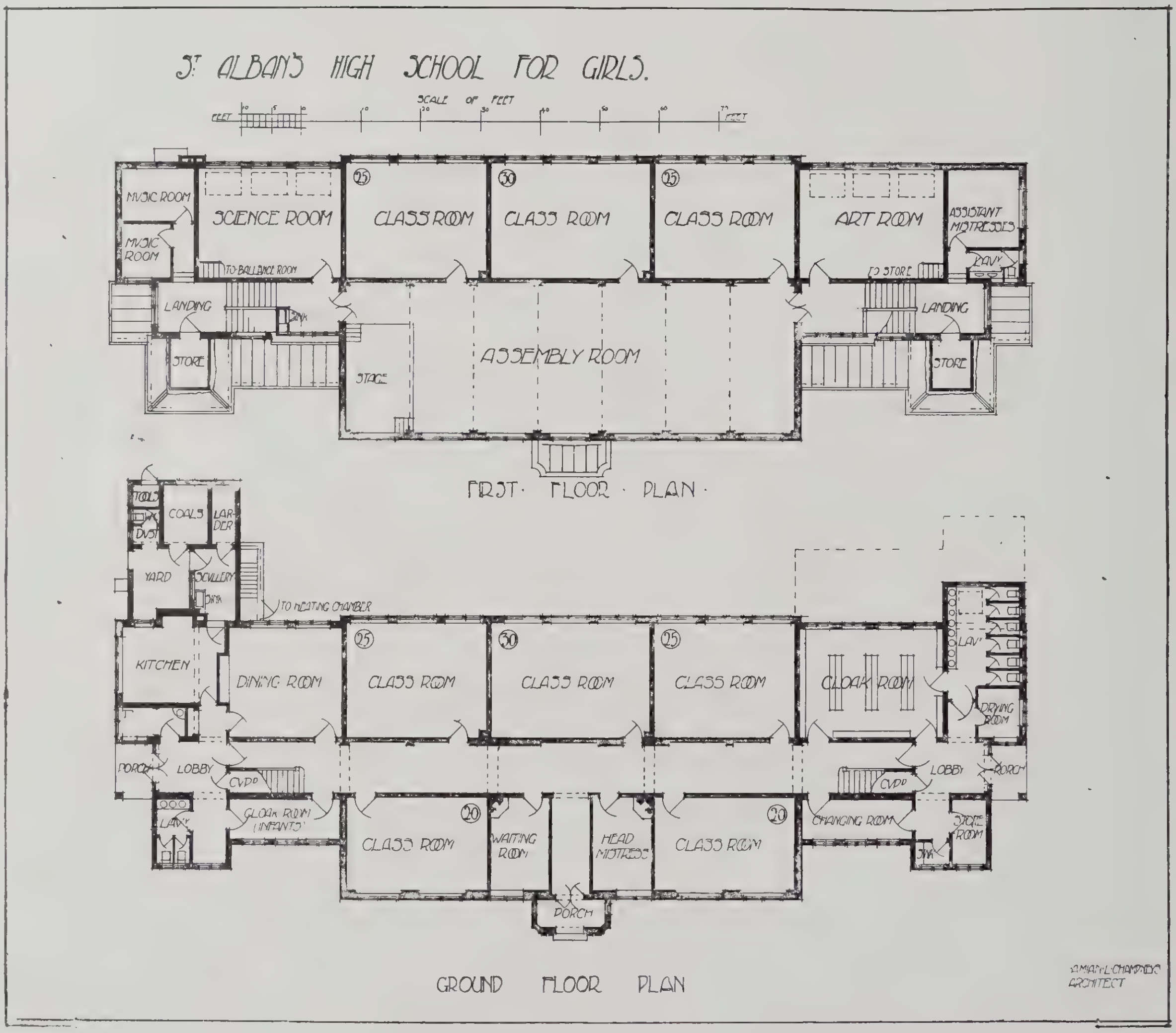
ADDITIONS TO GLASGOW CENTRAL STATION HOTEL: DINING SALOON (FIREPLACE).
JAMES MILLER, A.R.S.A., F.R.I.B.A., ARCHITECT.



ST. ALBANS HIGH SCHOOL FOR GIRLS AMIAN L. CHAMPNEYS, ARCHITECT. *(See page 644.)*

ST. ALBANS HIGH SCHOOL FOR GIRLS. Amian L. Champneys, Architect.

This new school is situated at Hall Place, St. Albans, Herts, and the main front faces south-west. The sub-soil is clay and gravel. A playing-field adjoins the building on the south-east side, and there is a gravelled playground at the back of the building. The main pupils' entrance is at the south-east end, and there is a Kindergarten entrance at the north-west end. The main entrance for the public is in the centre of the front. The building, which accommodates two hundred girls, supersedes the old school building in Holywell Hill, St. Albans. The accommodation comprises seven class-rooms, Kindergarten room, dining-room, laboratory and balance room, art room, and large central hall (75ft. by 25ft.), with stage for theatricals, etc. The facing bricks, 2½in. thick, are in two "colours," the quoins at angles and openings being light red, and the remainder dark red. The stonework is of Bath stone. The staircases and landings are of reinforced concrete. The roofs are covered with red sand-faced tiles, with, in parts, interlocking tiles. The doors are of Columbian pine, stained. Pitch-pine wood blocks are laid on the ground floor, except in the cloak rooms, lavatories, etc., where Doloment is used. The upstairs floors are boarded. The laboratory fittings are of oak, with teak tops. The lighting throughout is by means of incandescent gas. The foundations were prepared by Messrs. Webster and Cannon, of Aylesbury, and the superstructure was built by Messrs. C. Miskin and Sons, St. Albans. Some of the sub-contractors were: Asphalte, the Limmer Asphalte Co., Ltd.; facing bricks, in two colours, Kendall's Brick and Lime Co., Radlett, Herts; carved work, R. Bridgeman, Lichfield; fireproof partitions, Messrs. J. A. King and Co. (Mack partitions); interlocking tiles, Messrs. H. J. and C. Major; casement fittings and door furniture, G. W. Pridmore and Son, Coventry; stoves, grates, etc., Messrs. Rosser and Russell, Charing Cross, and Messrs. T. Elsley, Ltd., London, W. (the latter firm supplying also the rain-water heads); sanitary ware and fittings, Doulton and Co., Ltd.; special flooring, British Doloment Flooring Co.; gas fixtures, Sugg and Co.; railings, Messrs. C. Hall and Son, West Hampstead; folding gate, Bostwick Gate Co.; heating and ventilating, Rosser and Russell, Charing Cross.



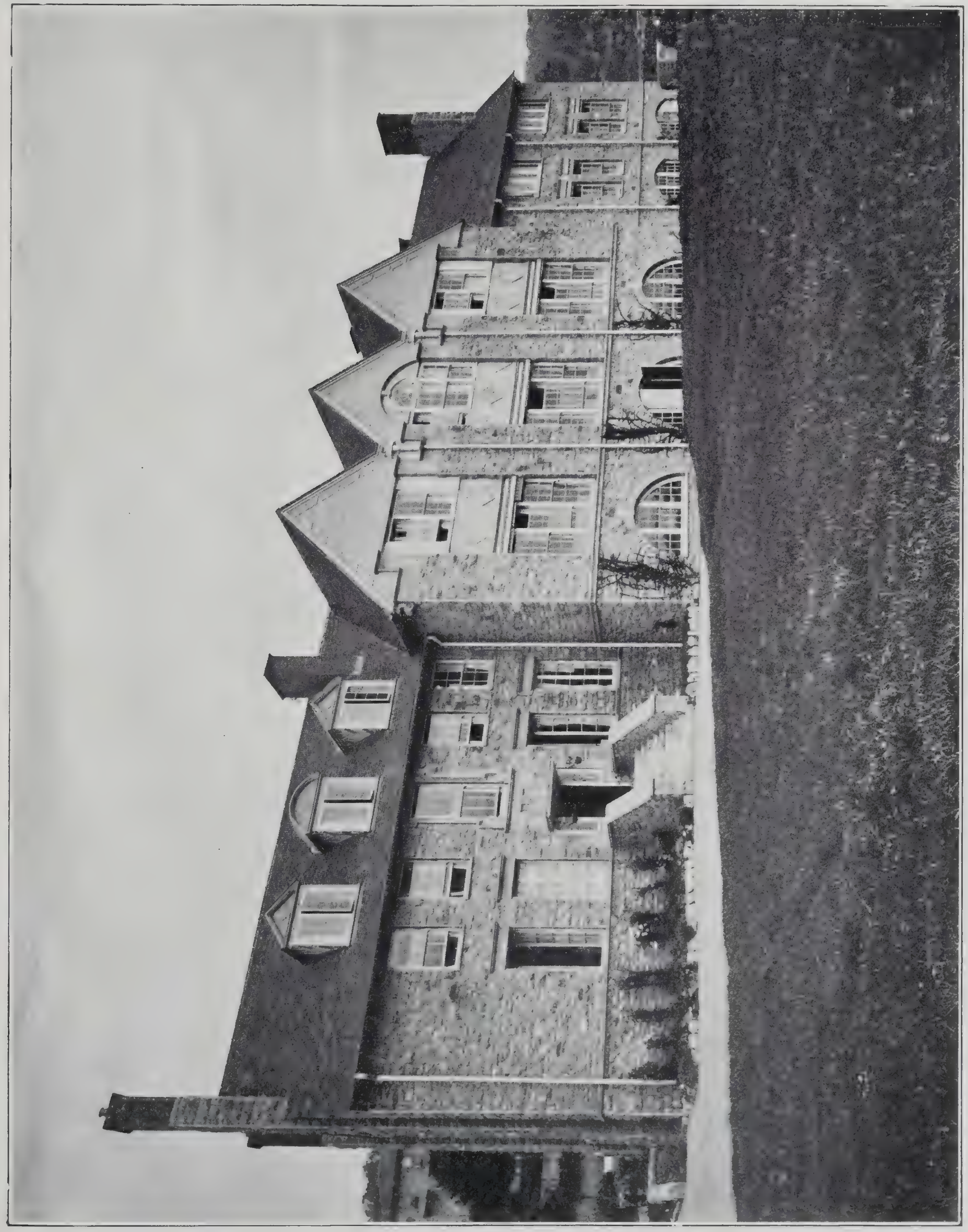
AMIAN L. CHAMPNEYS, ARCHITECT.

The accommodation comprises seven class-rooms, kindergarten room, dining room, laboratory and balance room, and large central hall with stage.

ST. PETER'S SCHOOL, WESTON-SUPER-MARE.

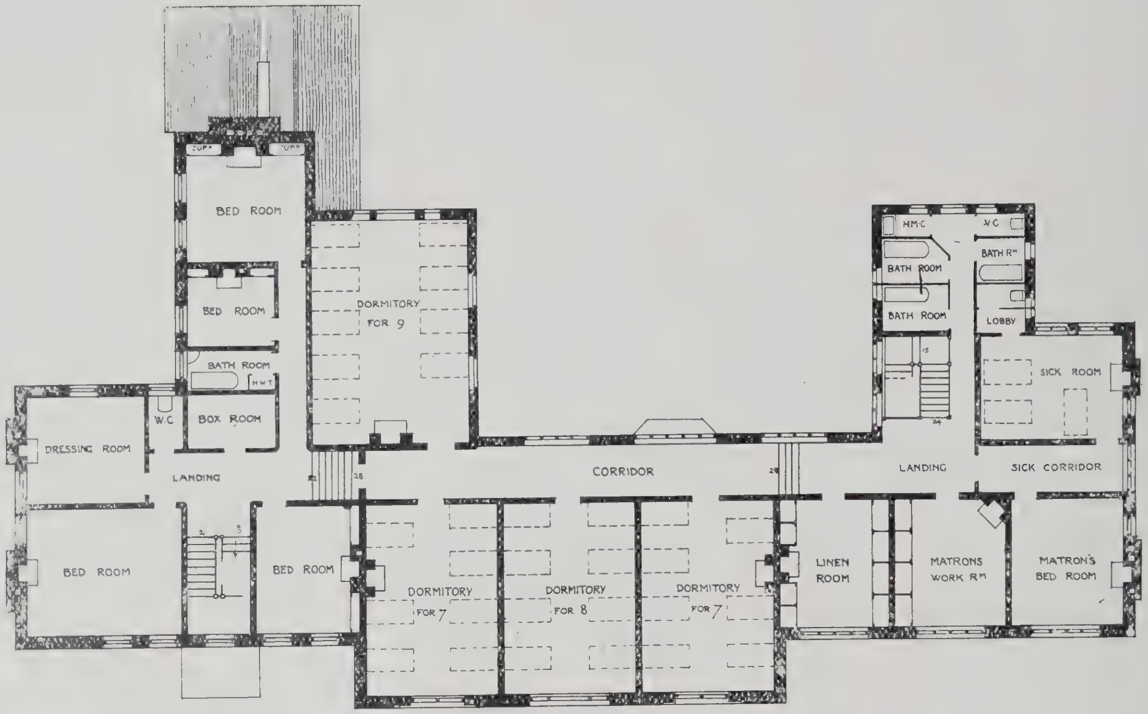
W. H. Ward and Gerald Cogswell, AA.R.I.B.A., Architects.

This school is built in an eight-acre field on the hill behind Weston-super-Mare. The site has a gentle slope to the south, overlooking the bay, and is sheltered towards the north-east by woods. The main front faces south, and the principal class-rooms and dormitories are planned with that aspect, the space facing north being utilised for communicating-corridors, changing-rooms, and lavatories, dining-hall, and kitchen offices. The subsoil is limestone rock. The building is erected directly on this, and excavated limestone was used in the walling, a further supply being obtained from an adjoining quarry. The dressings are of Monk's Park Bath stone. Cattybrook red bricks have been used for the external walls, and the lavatories have a salt-glazed dado. The chimneys are of specially-made 2in. red bricks, pointed with white mortar. The roofs are covered with brindled Broseley tiles, and the external woodwork is of memel, painted white. Internally, the work has been kept extremely plain. Most of the woodwork in the school portion is stained and varnished, and plain iron mantels have been adopted; but the dining-hall has a moulded wood ceiling and a moulded wood mantel. The buildings are heated by low-pressure hot water from a furnace in the basement, and there is a separate furnace for supplying hot water to baths, etc. The ventilation is by means of fresh-air inlets, the incoming air being warmed by radiators, while the outlet is by means of tubes connected to an electric-fan chamber in the roof. Electric lighting is installed. The accommodation is for



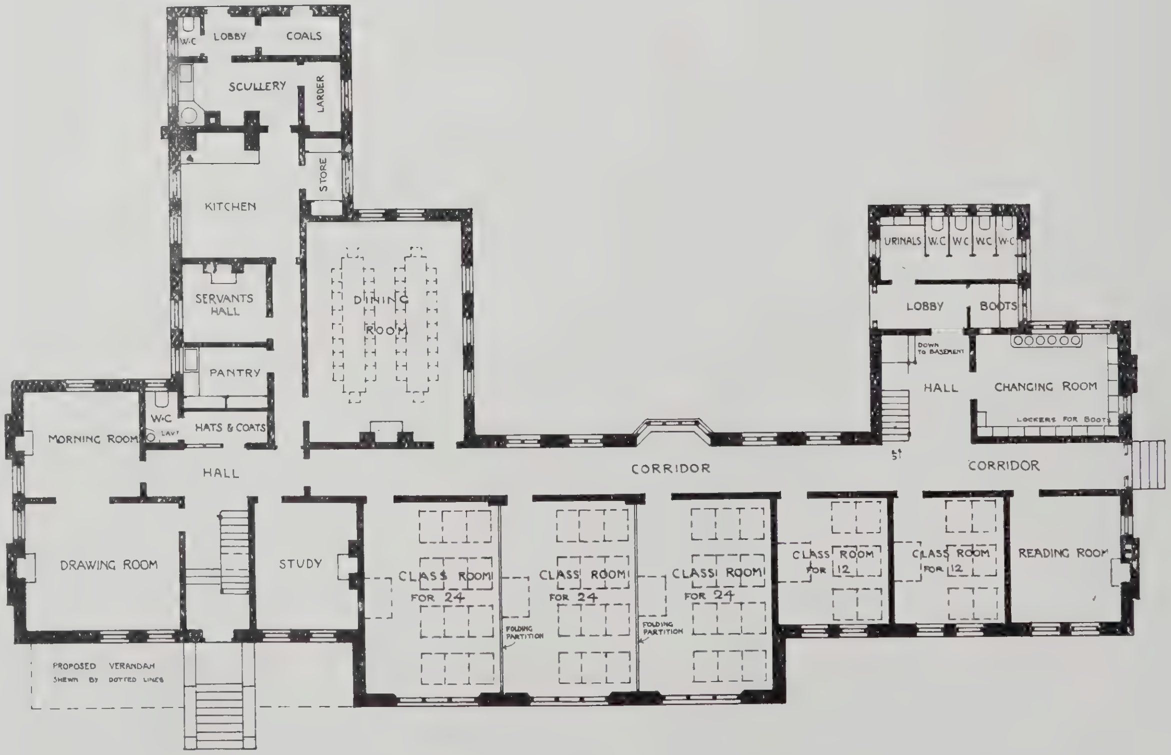
ST. PETER'S SCHOOL, WESTON-SUPER-MARE: ENTRANCE FRONT. W. H. WARD AND GERALD COGSWELL, AA.R.I.B.A., ARCHITECTS.

(Plans on next page.)



FIRST · FLOOR PLAN ·

SCALE OF 10 5 0 10 20 30 40 50 FEET



GROUND · FLOOR · PLAN ·

SCALE OF 10 5 0 10 20 30 40 50 FEET

ST. PETER'S SCHOOL, WESTON-SUPER-MARE. W. H. WARD AND GERALD COGSWELL, AA.R.I.B.A., ARCHITECTS.

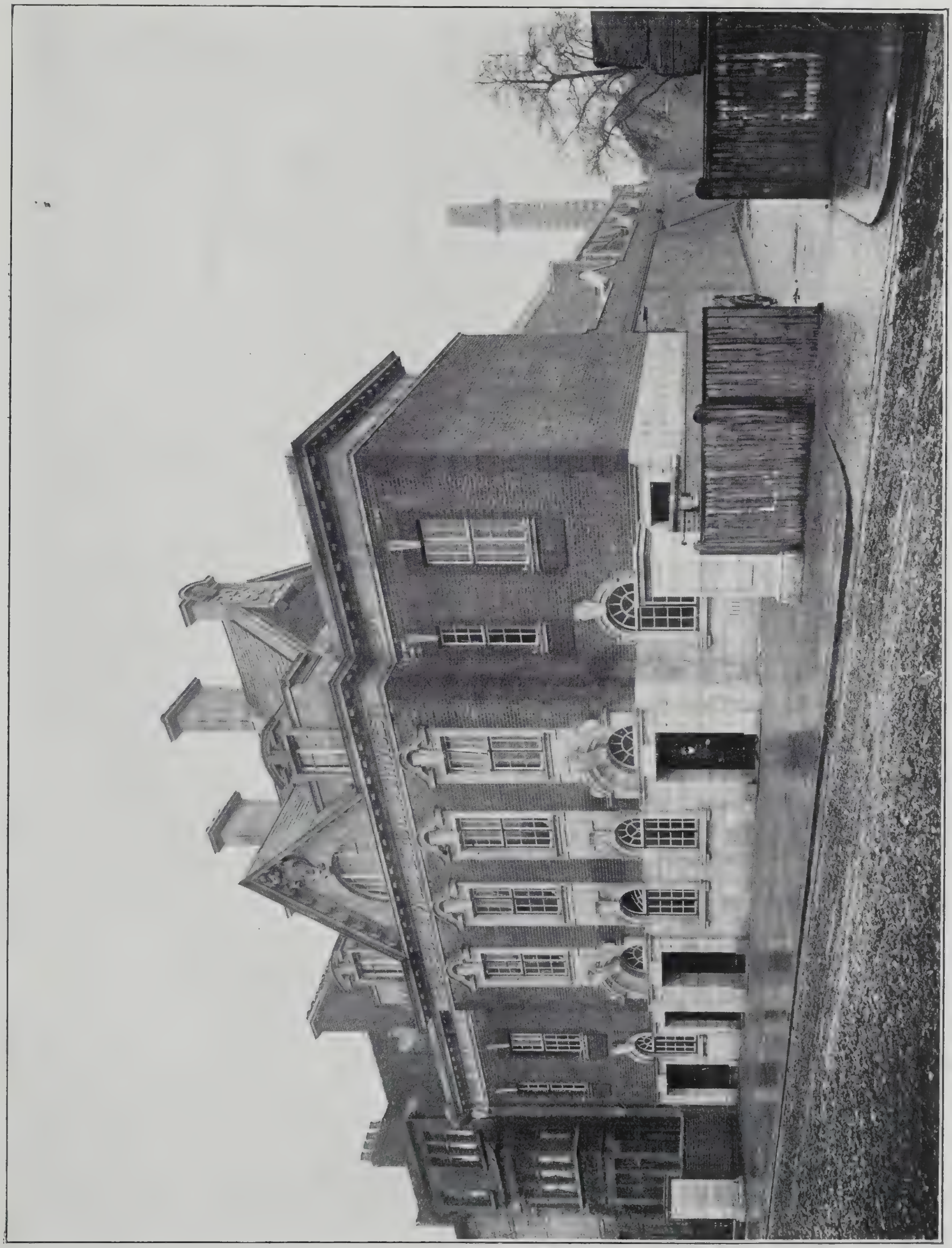
thirty boarders and thirty day boys. The general contractors are Messrs. R. Wilkins and Sons, Bristol. Several Mack partitions (J. A. King's) have been erected. The main floors have been laid by Acme Woodblock Flooring Co.; others are paved with Carter's red pressed tiles. The plumbing and sanitary work was done by Messrs. Rowe Bros. and Co., Bristol, who, with Messrs. Shanks and Co., supplied the sanitary ware and fittings. Folding partitions were supplied by Messrs. Peace and Norquoy, Manchester. The heating and ventilating are by Messrs. J. Jeffreys and Co., Westminster.

HAMMERSMITH PUBLIC BATHS. J. Ernest Franck, Architect.

The Public Baths and Washhouses built for the Borough Council of Hammersmith occupy a site that is of irregular shape, though of ample area. While the total depth of the site is about 520ft., the frontage on the east side is only 70ft., whereas the width on the west is nearly twice as great; and the difficulties of planning were increased by the necessity for observing certain prescriptive requirements with respect to rights of light, as well as several conditions of an agreement between the London County Council and the Borough Council.

The accommodation comprises: First-class swimming pond, 105ft. by 34ft.; second-class swimming pond, 100ft. by 30ft.; sixty-three slipper and lassar baths; public washhouse fitted with thirty washing stalls, thirty drying horses, and three hydro extractors, ironing room, establishment laundry, boiler-house with coal bunkers, engine room, engineers' workshop and store, three ticket offices, male and female staff mess rooms, club and waiting rooms, superintendent's residence, and engineer's residence.

The bold design of the main arched-roof principals over the first-class pond was rendered possible by the adoption of reinforced concrete. The use of steel stanchions would have necessitated projections from the wall, but with the adoption



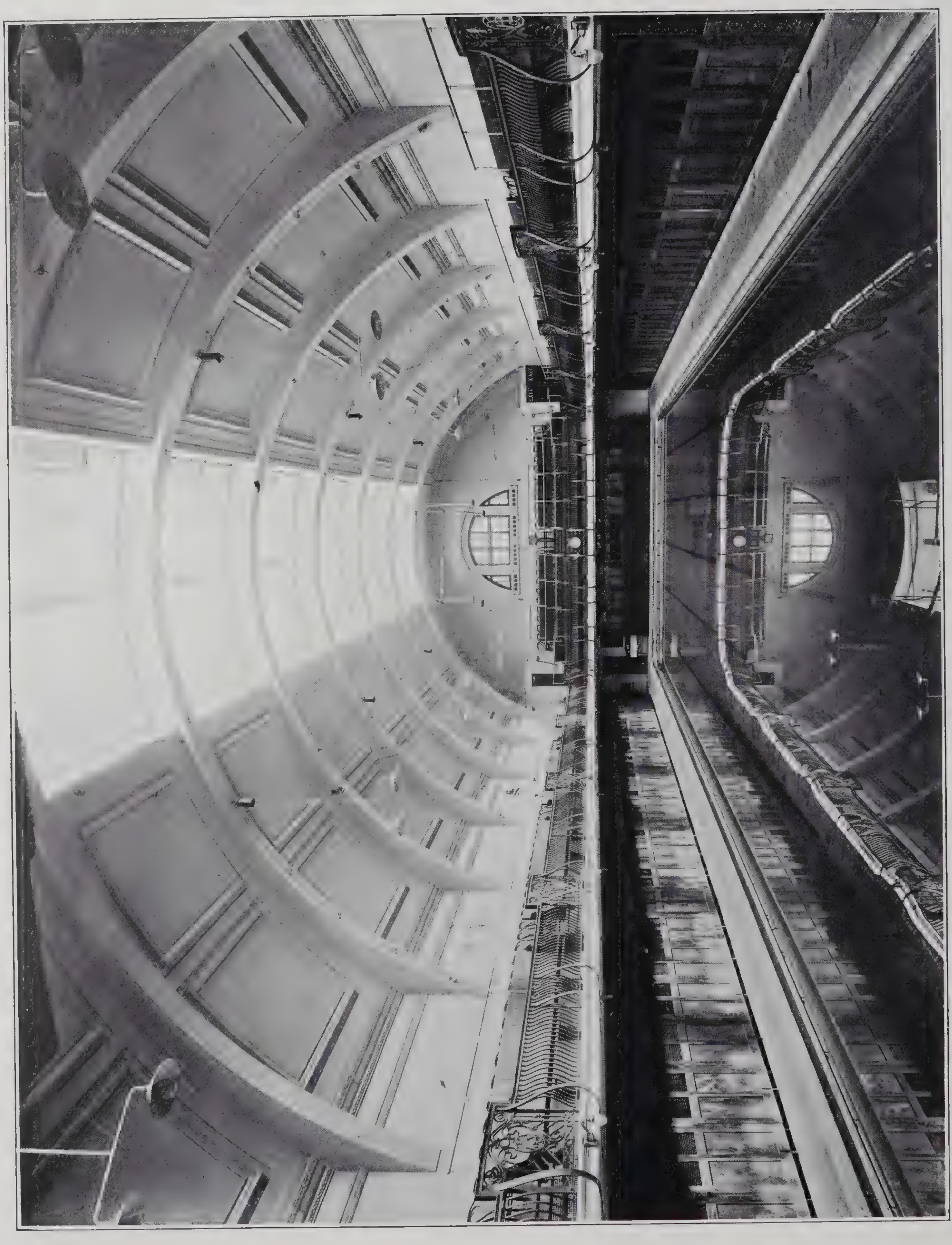
THE HAMMERSMITH PUBLIC BATHS: EXTERIOR. J. ERNEST FRANCK, A.R.I.B.A., ARCHITECT.

of reinforced concrete the stanchions or continuation of the main ribs were divided at the level of the roofs and corridors, were carried across them in an arched formation, were continued to the ground floor level on each side of the corridor, and joined again beneath the ground-floor, the lower portions of these stanchions thus becoming box-shaped. The architect considered that even if the roof trusses had been carried out in steel and covered with 2in. of some non-conducting external coating, such a structure would be less fire-resisting than ferro-concrete, and the ribs showing in the ceiling of this bath are true structurally. Moreover, steel roof trusses would have required periodical painting; but with reinforced concrete the necessity for maintenance hardly arises.

The frontages are faced with red brick with Portland stone dressings. The roof is covered with Precelly slating. The inner wall-faces of the swimming-bath, the public washhouse, and the establishment laundry, are of glazed brickwork, while the cornices, architraves, and dressings to the windows of the first-class bath are of Carrara Ware. The private baths, corridors, and other rooms are finished with dadoes in glazed bricks to various heights, the upper portions of the walls being finished in sirapite. The front portion of the entrance corridors in Lime Grove, and the entertainment entrance hall and corridor club-room No. 1, have dadoes carried out in plain coloured tiling from special designs by the architect. The gangways of the swimming baths are covered with non-slipping rubber tiles.

In the washhouses the sides and backs of the partitions to each stall are constructed for an exhaust vapour pipe to be carried the whole length of each range of stalls into extract ducts formed in the wall, the floor of the washhouse being formed to give a fall to this pipe for draining any condensation water. A separate connection is taken from each boiler into the main exhaust pipe, and by this means the washhouse is kept entirely free from steam.

The general contractors were Dearing and Sons, of Clarence Works, Halliford Street, N. The following are some of the sub-contractors: The Expanded Metal Co., Ltd., of Westminster, were the sub-contractors for the whole of the reinforced concrete construction, except the concrete foundation rafts under the chimney and other portions of the building, which rafts were reinforced with expanded steel, and constructed by the general contractors. The reinforced concrete work comprised the two swimming ponds, an elevated storage

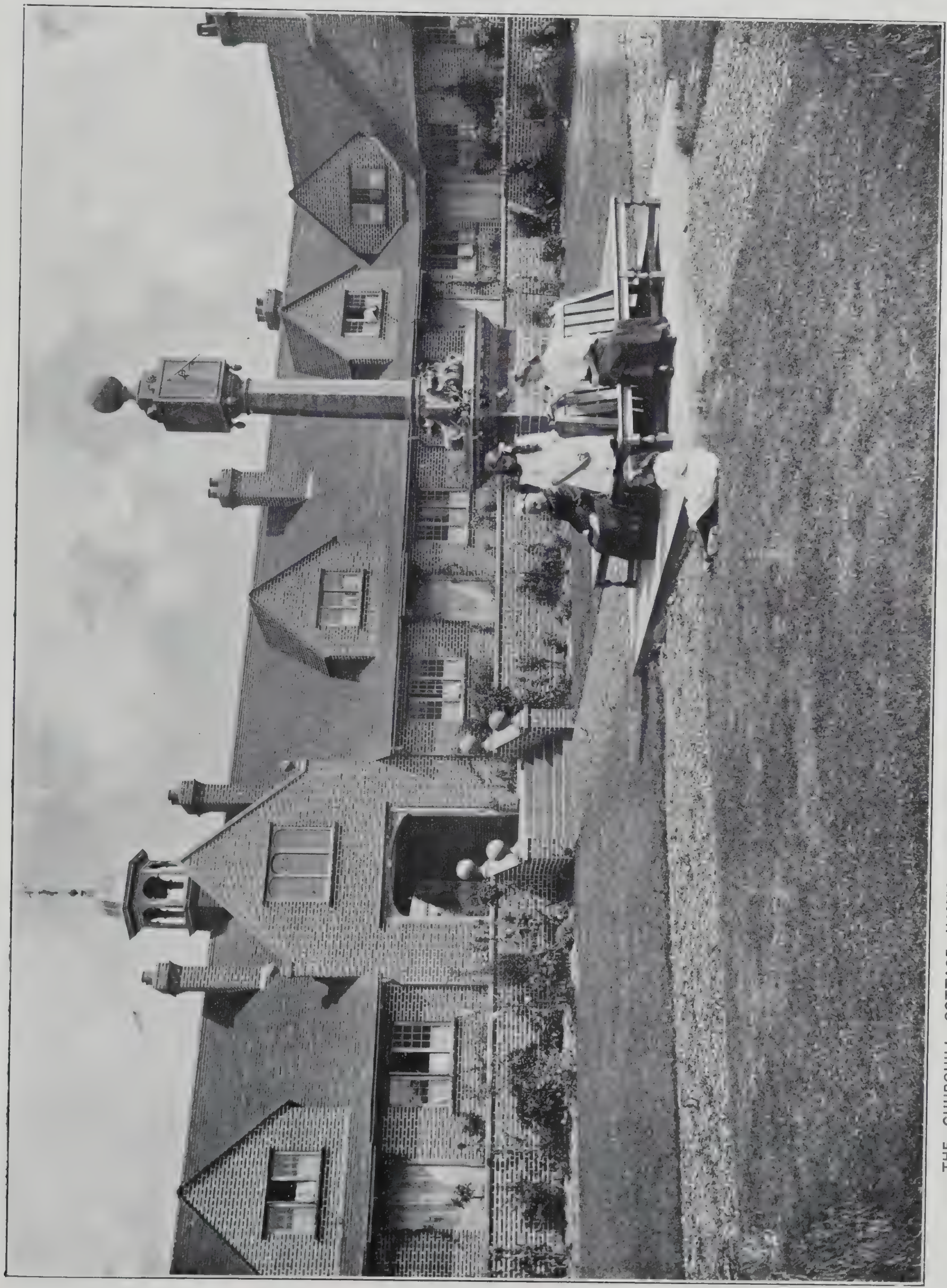


THE HAMMERSMITH PUBLIC BATHS: GENERAL VIEW OF THE LARGE SWIMMING POND. J. ERNEST FRANCK, A.R.I.B.A., ARCHITECT.

tank of 22,850 gallons capacity; nine arched roof principals (50ft. clear span), cantilever gallery round pond, and floors and flat roofs thoughout the building. The reinforcement throughout was expanded steel of various strengths, and Kahn trussed bars supplied by the Trussed Concrete Steel Co., of London. The "Ferrocrete" brand of Portland cement, supplied by the Associated Portland Cement Manufacturers, Ltd., was used throughout. "Mack" partitions, J. A. King and Co. The whole of the bath fittings were supplied by Doulton and Co., of Lambeth. Electric light fittings, F. and C. Osler, and Fittings, Ltd. Glazed bricks, lining to swimming ponds, and porcelain baths, The Farnley Iron Co.; T.L.B. facing bricks to front, T. Lawrence and Sons, Bracknell; tiling to entrance corridors, Craven Dunnill and Co.; tiling to bath gangways, Pilkington Tile and Pottery Co.; plasterwork to barrel ceiling over main baths, F. de Jong and Co., Camden Town; fire-grates and mantels, Bratt Colbran and Co.; lightning conductors, Joseph Lewis; drainage fittings, John Jones (Chelsea), Ltd.; the whole of the general engineering scheme, and the fittings to the public washhouse, laundry, etc., J. and D Tullis, Ltd.; wrought ironwork gates and railings, and brass foundry work Lockerbie & Wilkinson

THE CHURCHILL COTTAGE HOMES. Silcock and Reay, Architects.

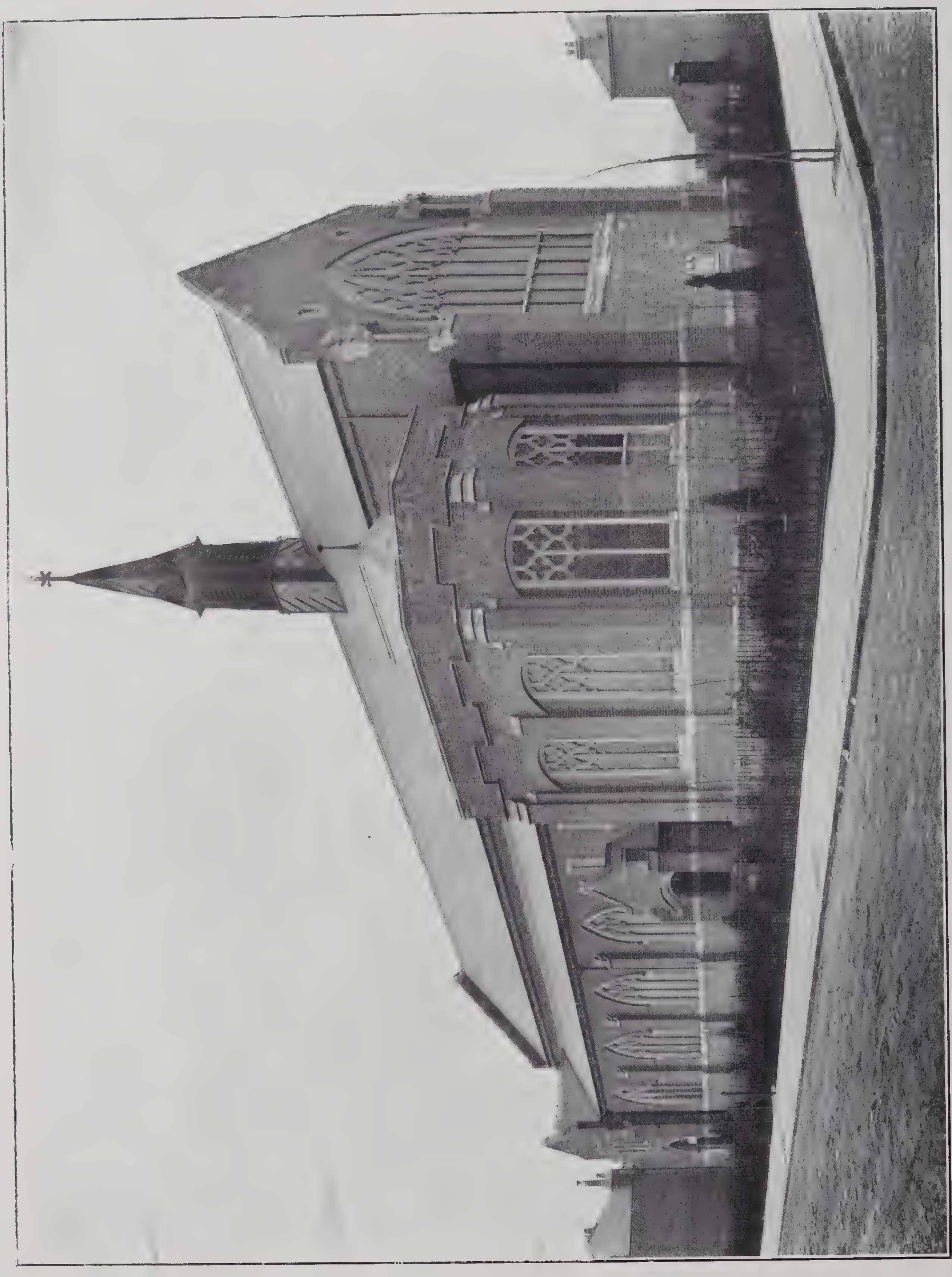
The Churchill Cottage Homes were built in the Cheddar Valley, Somerset, by the late Mr. Sidney Hill, J.P., whose object was to provide twelve comfortable homes for the deserving poor. In addition to a completely furnished house, each occupant of these homes is given a sufficient weekly sum for maintenance, a perpetual income of £400 a year being set aside for this pur-



THE CHURCHILL COTTAGE HOMES: GENERAL VIEW FROM THE QUADRANGLE. SILCOCK AND REAY, FF.R.I.B.A., ARCHITECTS.

pose under the endowment scheme administered by trustees. The houses, which stand upon freehold land containing one and a half acres with a field upon the south having an area of four acres belonging to the trust, and reserved for ever as an open space, are arranged on three sides of a quadrangle about one hundred and twenty feet square. The third or the south side is enclosed by a low brick terrace wall coped with stone and ornamented with carved stone vases, and in the centre is a gateway with fine wrought-iron gates giving access to the working gardens with which each occupant is provided. Wide stone-paved walks run round the four sides of the quadrangle, the south walk being terminated at each end with a large arbour arranged under the main roof, which is supported by oak posts and balustrades, each arbour containing suitably designed oak seats and tables. The quadrangle has low brick parapet walls running entirely round it, with stone steps leading down to the lawn and flower borders; these are sunk some two feet six inches below the level of the stone-paved walks, and in the centre is a large stone sundial with decorative features in lead, and having a spreading base of brick, around which is an oak seat.

Flower borders are arranged upon each side of the walks in the quadrangle, and



ST. PAUL'S CHURCH, WEST EALING: VIEW FROM THE SOUTH-EAST. HALL-JONES AND CUMMINGS, ARCHITECTS.

(See page 652.)

many beautiful rose trees and creepers have been planted against the houses and arbours.

The quadrangle faces south and commands a most beautiful view of the Mendip Hills, which at this point are well wooded.

The north side is separated from the road by a forecourt 200ft. long and 50ft. deep, and about five feet above the road level, having lawns and walks with flower borders and trees, and adjoining the road is a terrace wall of brick with large stone vases and rich entrance gates of wrought iron approached by a flight of steps from the road.

The north, east, and west sides of the houses are symmetrically designed with gables and recessed arbours having oak posts and arches. The doorways throughout are constructed of oak frames and arches with oak doors, those in the quadrangle having moulded hoods supported by richly carved corbels.

The walls are of sand-faced brick, with hand-made red tile roofs, the window frames being of oak, with iron casements and lead-light glazing. The stone, which is sparingly used, is from the Guiting Quarries, and its rich yellow tint harmonises well with the warm tones of the walls and roofs.

Each house has upon the ground floor a living-room and bedroom with a small scullery, larder, etc., and upstairs is another bedroom and a large storeroom. The houses are self-contained and free from the usual excrescences at the back; there are, in fact, no backs at all as generally understood, all the elevations being equally important.

Over the principal entrance to the quadrangle is a large room for the use of the trustees, reached by a spiral stone staircase. This room is panelled to a height of seven feet, and has a stone fireplace and windows at each end, on which are the coat of arms of the founder.

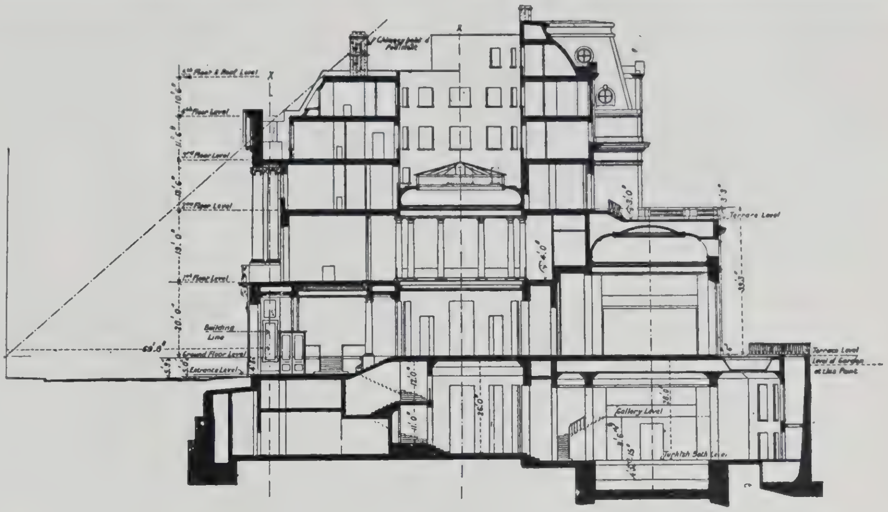
The "Worker" grates adopted for the living-rooms are set in golden brown bricks with raised hearths of the same material. The bedroom grates have green tile surrounds and tiled hearths, and all the fireplaces have simple oak mantels. A guard fender is provided for each living-room, and bells enable each house to communicate with the others in case of emergency.

All the houses are completely furnished with substantial oak furniture designed by the architects in harmony with the general style of the homes.

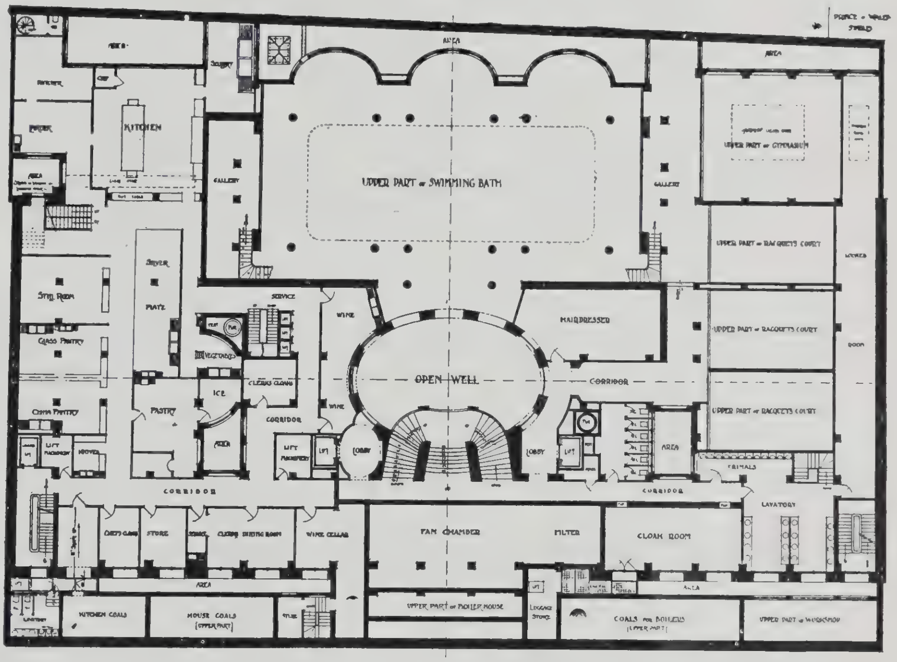
In carrying out the work every endeavour has been made to obtain and preserve throughout the old-world character and quiet charm attaching to the many fine old groups of houses of this kind scattered throughout the country, and with this end in view no detail, however unimportant in itself, has been deemed unworthy of attention.

In the north-west corner of the site and adjoining the road a matron's cottage has been built containing two sitting-rooms, a kitchen, three bedrooms, and a bath-room, and in the south-west corner a small but fully-equipped laundry has been provided and built, together with other necessary outbuildings.

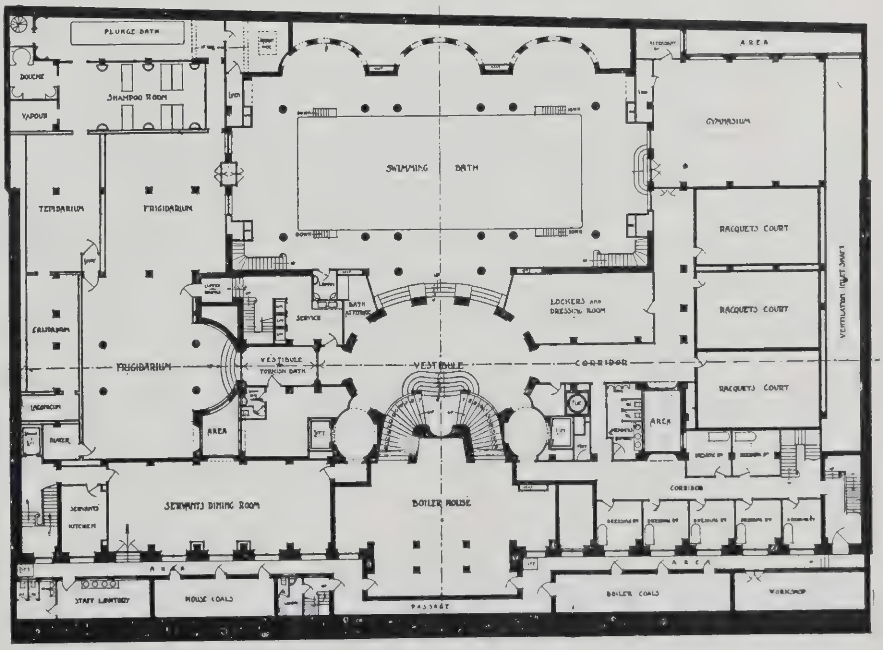
The actual cost of the buildings, exclusive of the cost of land and expenses in connection with their erection, amounted to £11,000, and the furniture in the homes, the trustees' room, the matron's cottage, etc., amounted to a further sum of £1,915. The gardens and planting cost about £900 more.



Section.



Lower Ground Floor Plan.



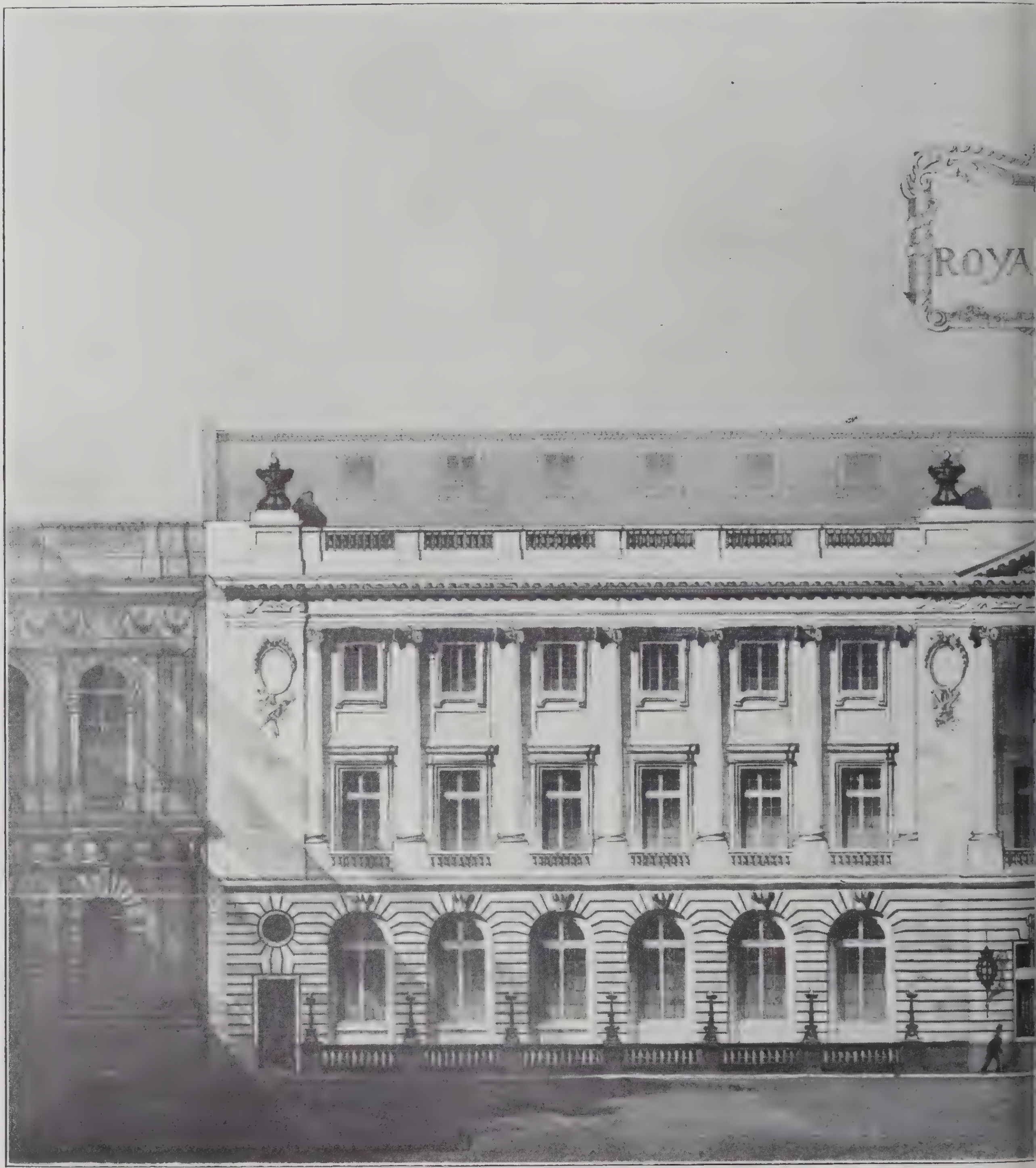
Basement Plan.

ROYAL AUTOMOBILE CLUB, PALL MALL: PLANS. MEWES AND DAVIS AND E. KEYNES PURCHASE, ARCHITECTS.

(For View, see overleaf.)

CHURCH OF ST. PAUL, WEST EALING.

This church has recently been erected in the south-west district of Ealing. Having regard to the desired economy in outlay, it was essential that the design should be of simple character; but this is relieved by the tracery of the windows and, there being no clerestory, the aisles are unusually lofty and give a dignified effect to the interior. The church is faced externally with yellow bricks and Bath stone dressings, and finished internally with similar stone and grey sirapite plaster. The walls of aisles and chapel are panelled to a height of 12ft. and distempered an olive-green colour, the east wall of chancel being treated more



THE FACADE AT PALL MALL. MEWES AND

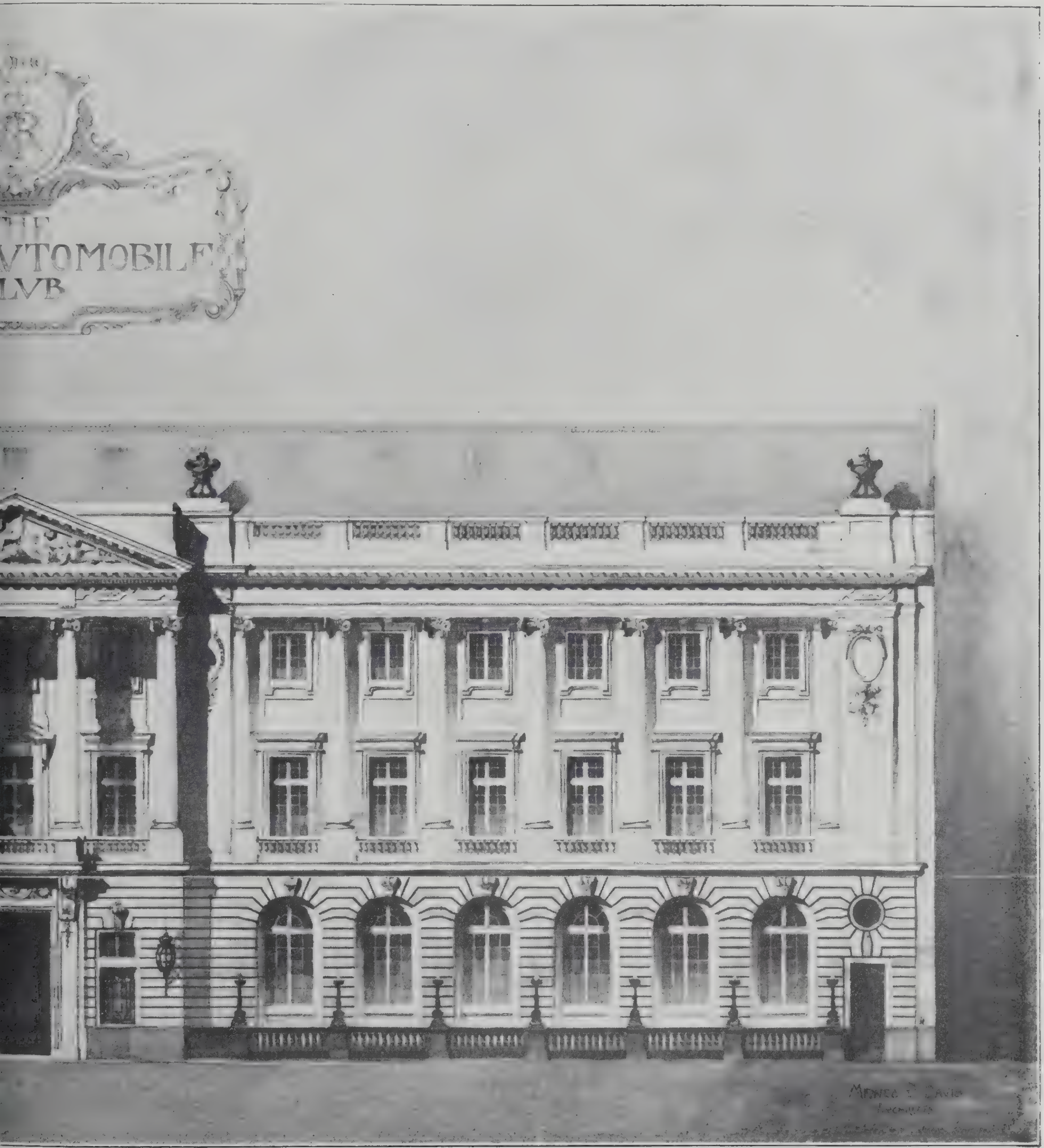
ROYAL AUTOMOBILE CLUB, PALL MALL.

A notable exmple of the French influence that will soon be found in Pall Mall, on a part of the site occupied by the old buildings—formerly the War Offices—between the Carlton Club and St. James's Palace grounds, in the new home of the Royal Automobile Club.

Pall Mall (though it exhibits a few aberrations) has been more fortunate than most of London's principal streets, in so far as the newer buildings have been for the most part at least the equals in design of the older structures which they have superseded. English sentiment breeds reverence for anything that is old, regardless of whether or not the object be intrinsically worthy of it; which, as far as architecture is concerned, may be understood when one looks upon the good, if commonplace, old structures, and then upon the pretentious so-called “improvements”; one

Hall-Jones and Cummings, Architects. (*Illustrated on page* 650.)

elaborately. The pulpit, reading desk, and choir stalls are of oak, and the remainder of joinery pitch pine. The church is heated by steam radiators, and fresh-air inlet ventilators are arranged in conjunction with these, the foul air being extracted by means of a fan in the flèche. The seating accommodation of the church is 800, and the total cost works out at about 9,000. The builders were T. H. Kingerlee and Sons, of Oxford, the glass was executed by W. Smith, of Balcombe Street, heating and ventilation by Russell and Co., of Lancashire Court, New Bond Street.



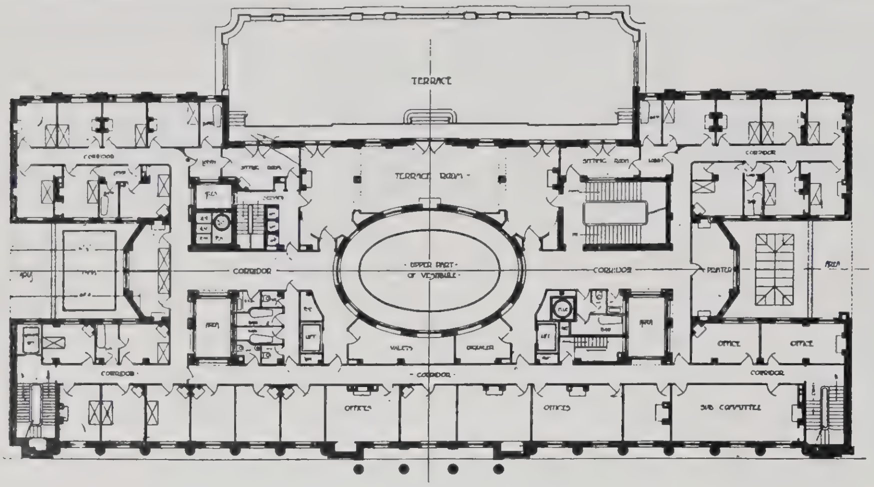
E. KEYNES PURCHASE ARCHITECTS.

Mewès and Davis and E. Keynes Purchase, Architects.

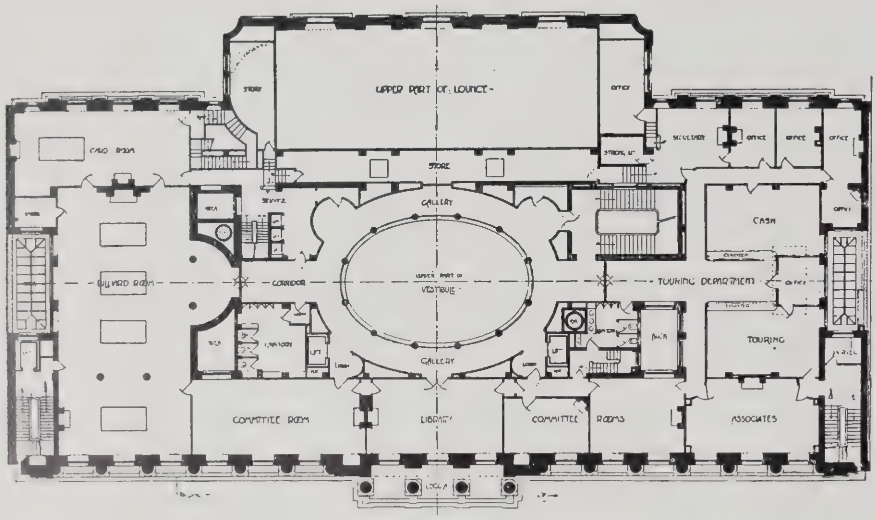
grasps in an instant the national antipathy to "improvements," sympathises with it, and gives the protesting public credit for at least good judgment.

The old War Offices were just such commonplace old buildings, with nothing remarkable about them—only plain—not particularly refined, just inoffensive, and the improvement will be a real one. The Royal Automobile Club is being built from the designs of Messrs. Mewès and Davis, with whom is associated Mr. E. Keynes Purchase, the honorary architect of the club.

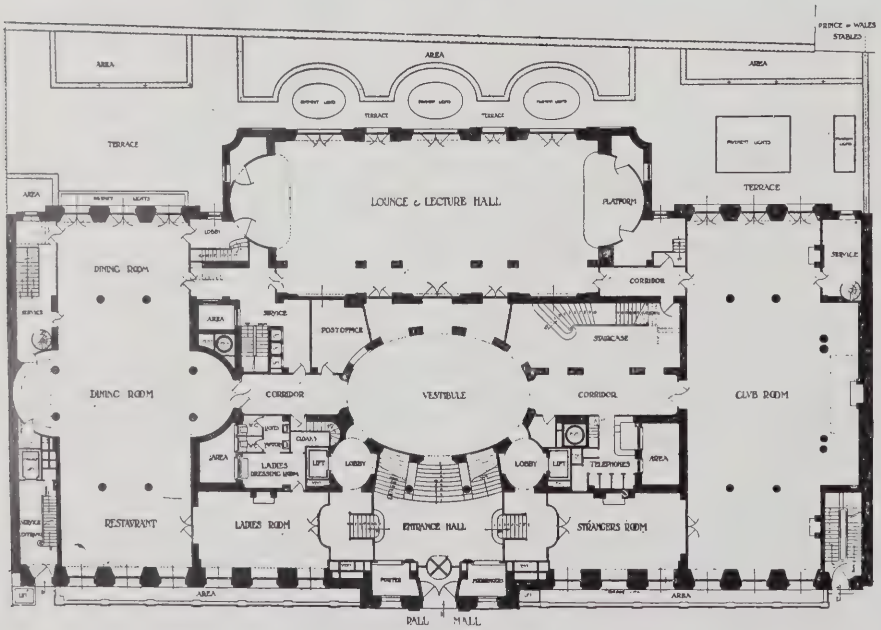
Few modern buildings afford such opportunities for the display of an architect's abilities as does a club-house, for which there are many obvious reasons. There is, for instance, no opposition party demanding an investigation of every penny spent upon those details and



Second Floor Plan.



First Floor Plan.



Ground Floor Plan.

ROYAL AUTOMOBILE CLUB, PALL MALL. MEWÈS AND DAVIS AND E. KEYNES PURCHASE, ARCHITECTS.

materials which come beyond the range of "rigid economy," usually the bane of the architect's existence when he is working upon the plans of a building that is to be erected from funds gathered by the tax collector. Neither is there the trouble of educating the client from "Victorian Gothic" to serenity, nor the diplomatic labour necessary to convince his clients' lady relations that his design cannot be materially improved upon —and cheapened at the same time—by adopting all the suggestions set forth in the architectural (?) section of some newspaper for ladies, which are sometimes brought to bear against his ideas as to domestic work. Perhaps most fortunate of all is the fact that this is in no sense a commercial structure. An important social club—especially an Automobile Club—implies a certain assumption of the wealth of its members, but differs from an expensive hotel, in that its object is not primarily to make money; and therefore it need not vie with its neighbours in pretensions to luxuriousness for the sake of the advertisement entailed. Moreover, the members of its committee may be expected to possess a degree of taste and judgment that is perhaps hardly so likely to be found in those charged with the erection of public or ecclesiastical or commercial structures. A club committee are less likely, also, to leave the architect without information as to what is required, or to goad and hamper him with unreasonable conditions and absurd restrictions. A member of such a committee could never be selected from the ranks of resolute busy-bodies, even if by some strange mischance such a pest had been admitted to membership. Hence obstructive interference or aggressive individuality is improbable of intrusion upon the domain of the architect, and he is left to solve his problem under almost ideal conditions. He is given the site, and the approximate number and kind of rooms for reception and entertainment, for accommodation of members, and for service. The engineering detail, if more complex, may be less in evidence than is usually necessary in other large buildings. Participating at once in the nature of the domestic and public building the high-class club is the least of each and the highest type of both—the home of good form and refinement. Strongly marked or eccentric personality, if not discountenanced, is genially tolerated; but extraordinary originality, especially if it leans to eccentricity, is *not* clubbable. It follows that the character of the architecture of a club must be dignified, the style correct, and the individual element in design which makes a home charming to one person and unbearable to another must be eliminated from consideration.

It is for these reasons that impersonal, if not strictly monumental, architecture has been the rule for the best clubs of the West End, high Renaissance being the type of design which has prevailed in Pall Mall. Of the clubs extending from Waterloo Place to St. James's Palace (which includes the Athenæum, Travellers', Reform, Army and Navy, and Carlton), the façade of the Travellers' is based upon the design of the Pandolfini Palace in Florence, and that of the Carlton upon the Library at Venice, and the Reform and Army and Navy upon places at Rome and Venice.

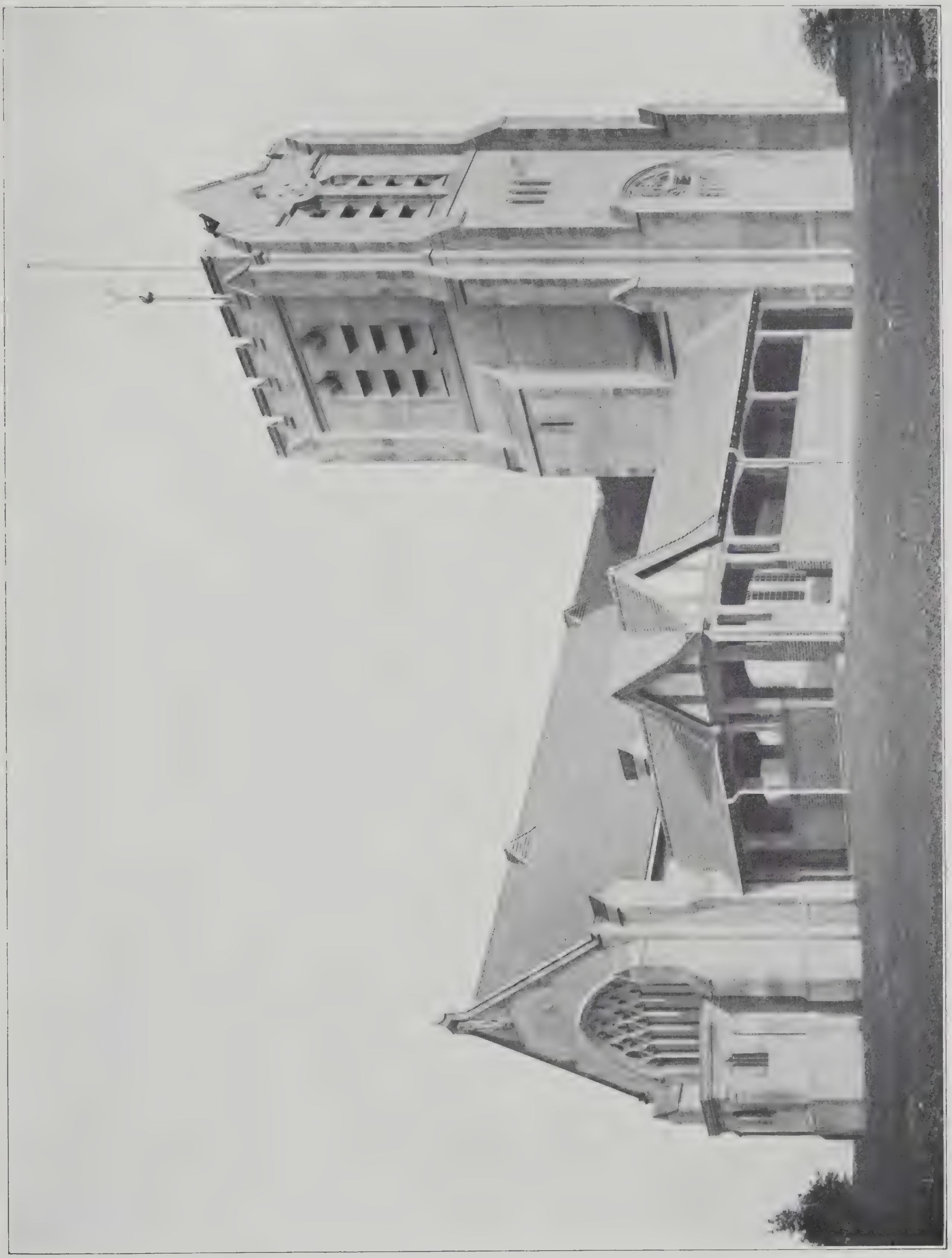
The Royal Automobile Club, which will adjoin the Carlton, follows the precedent more or less adopted by the other clubs, and owes its inspiration to the former Hotel Crillon-Coislin—now the Automobile Club—in the Place de la Concorde, Paris. It would be difficult to find a more beautifully studied example of modern architecture than the fine fronts by Gabriel facing the Place de la Concorde—there are two buildings, exactly alike, the former Hotel Crillon-Coislin and the Ministère de la Marine—second only to Perrault's colonnade of the Louvre.

The general contractors are Messrs. Waring and White, Limited. Messrs. J. A. King and Co. are supplying a large quantity of their King fireproof pumice concrete partitions, and their Mack slabs for use in forming air-ducts, as well as concrete blocks for encasing beams. The Leeds Fireclay Co. have supplied white Impervit glazed bricks and tiles.

DODFORD CHURCH, WORCESTERSHIRE. Arthur Bartlett, Architect.

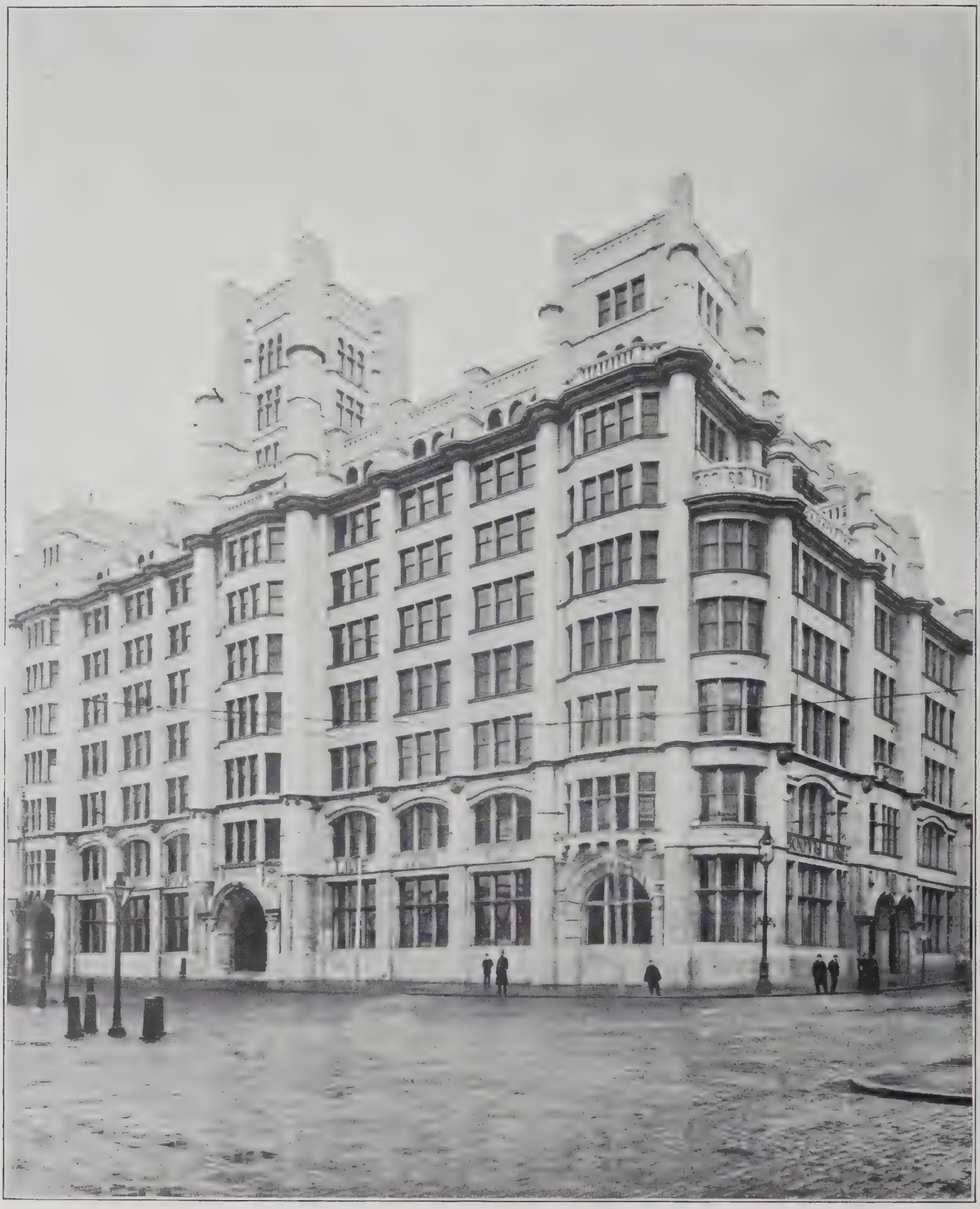
This building has been erected on the western slope of a hill between Kidderminster and Bromsgrove, looking out on to the Malvern Hills. The new parish of Dodford was carved out of the mother parish of Bromsgrove, the living endowed and the new church buildings erected through the munificence of the Rev. W. G. Whinfield, a former curate of Bromsgrove. The cloisters shown in the photograph surround a paved court, with an open-air pulpit reached from the tower staircase. It is intended to have open-air services for children and others during the summer months in this cloister court. The structure is built of local bricks, covered with cement rough-cast, and with local stone dressings.

Inside the church massive stone arches span the nave and take the place of roof principals, and in the soffits of the arches are modelled plaster panels with representations of the produce of the district—most of the parishioners get their living by market gardening. The cross shown on the rood-beam, made of metals and enamels, is the work and gift of Miss Amy Walford, a pupil of Professor Herkomer. The beam itself is made of silver harewood, with emblems of gilded lime tree, and is the work of Messrs. Martyn, of Cheltenham. Mr. Charles Beacon, sculptor, modelled the Madonna and children on the



DODFORD CHURCH, WORCESTERSHIRE: VIEW FROM THE SOUTH-WEST.

gable over the cloister entrance. The general contractors were J. and A. Brazier. The modelled plasterwork was executed by the Bromsgrove Guild; the stained glass and leaded lights by A. J. Davis. Messrs. Wooland, of Hereford, executed the acetylene gas lighting; Messrs. Ward, Worcester, the heating; and Messrs. Nicholson, Worcester, supplied the organ.

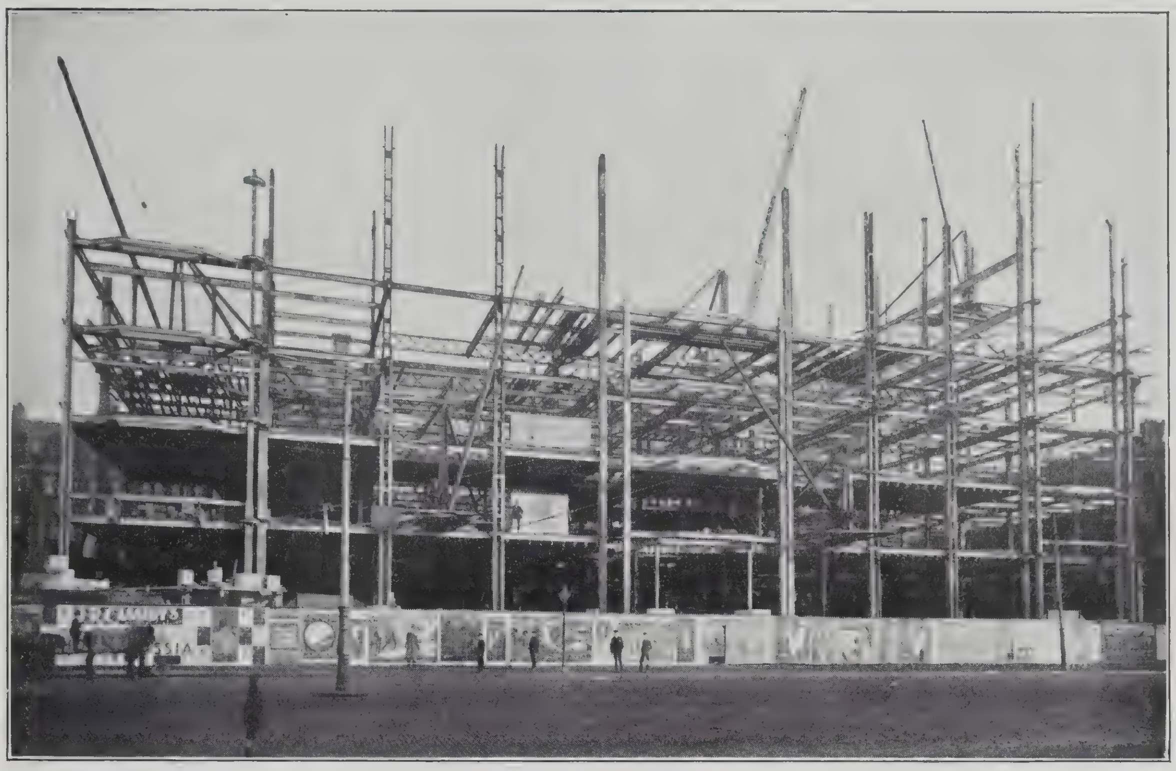


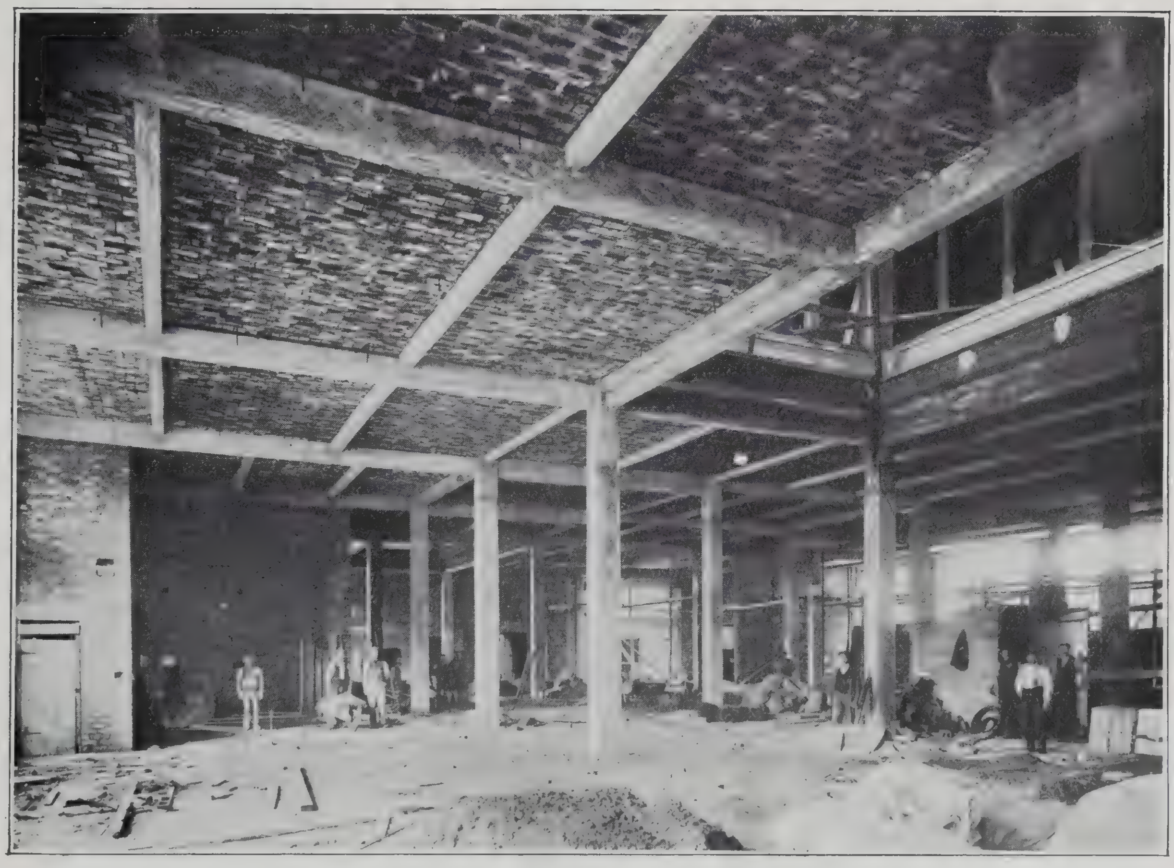
THE TOWER BUILDING, LIVERPOOL. W. AUBREY THOMAS, ARCHITECT.

THE TOWER BUILDING, LIVERPOOL. W. Aubrey Thomas, Architect.

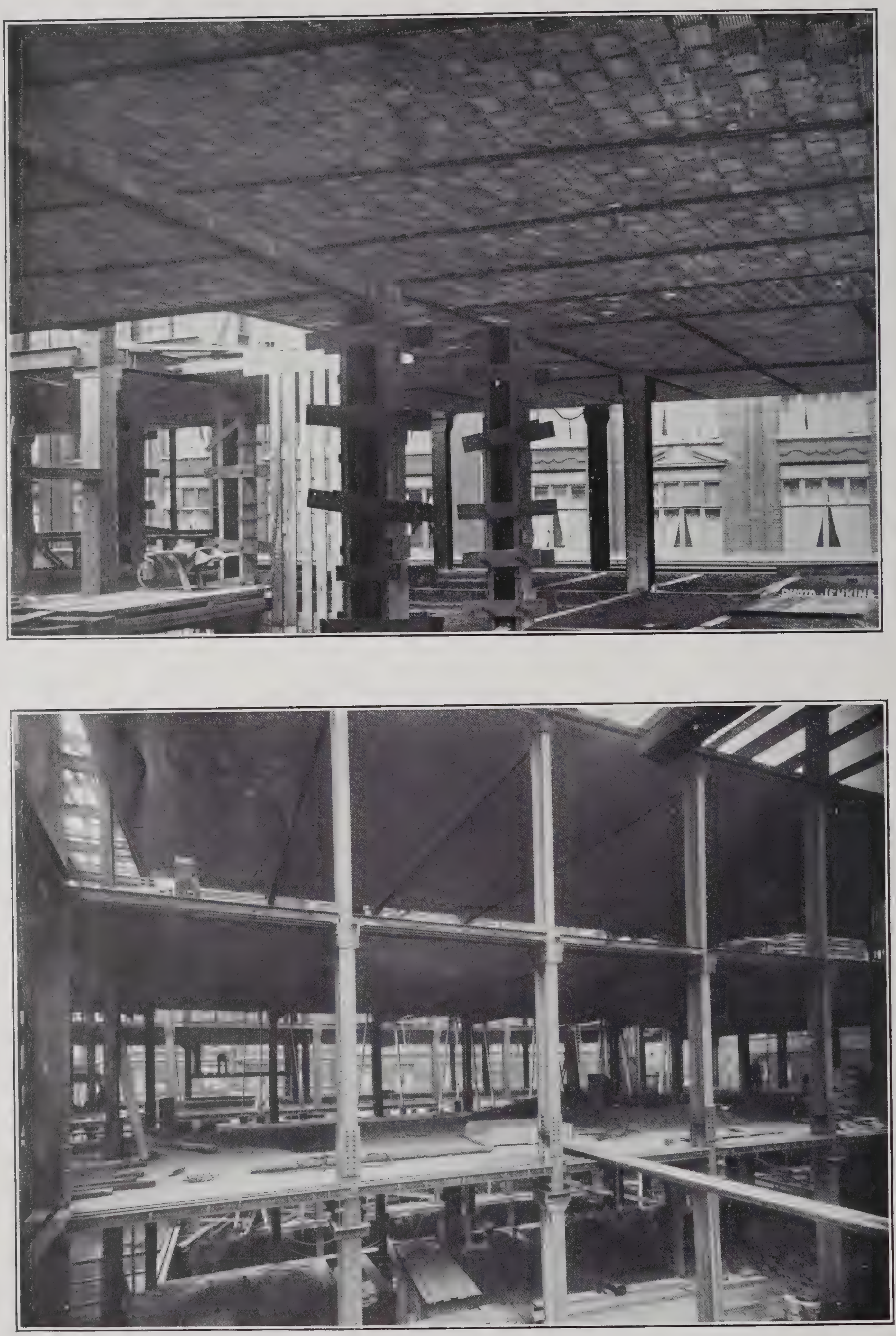
The Tower Building is one of the largest office blocks in Liverpool, the total area of the office accommodation being 11,800 square yards. The name is derived from the fact that the site was formerly occupied by a castellated structure which in bygone times was the fortress of the Earls of Derby. The elevation to the ground-floor storey is of granite, and for the remainder of the height "Carrara" has been used. The main building rises in eight storeys to a height of 115ft., in the towers at the angles in nine storeys to 130ft., and in the main tower in eleven storeys to 153ft. above the ground-level. There are three public entrances, one in each of the three principal frontages. The planning is simple and direct, abundance of light being provided. Access to the various floors is from three main staircases, and from four electric elevators.

The general contractors are Messrs. W. Thornton and Son, Liverpool. The fire-resisting floors, stair-cases, and roofs have been constructed by the Kleine Patent Fire-resisting Flooring Syndicate, Ltd., High Holborn, London. The "Carrara" façades were executed by Messrs. Doulton and Co., of the Royal Doulton Potteries, Lambeth, who have also supplied the sanitary fittings. The extensive plastering work, plain and decorative (with some fine ceilings in fibrous plaster), the reinforced fireproof walls on the indented bar system, and the fireproof partitions, were executed by Messrs. Henry Johnson and Sons, Primrose Hill, Fontenoy Street, Liverpool. Messrs. Dargue, Griffiths, and Co., Liverpool, carried out the electric lighting of the Booth Line offices, which occupy the whole of the ground floor, and installed their D.G. Centralised System of forced circulation hot-water heating apparatus. Five electric passenger lifts have been fitted by the Easton Lift Co., Ltd., of Broad Sanctuary Chambers, Westminster, and the chief provincial cities.

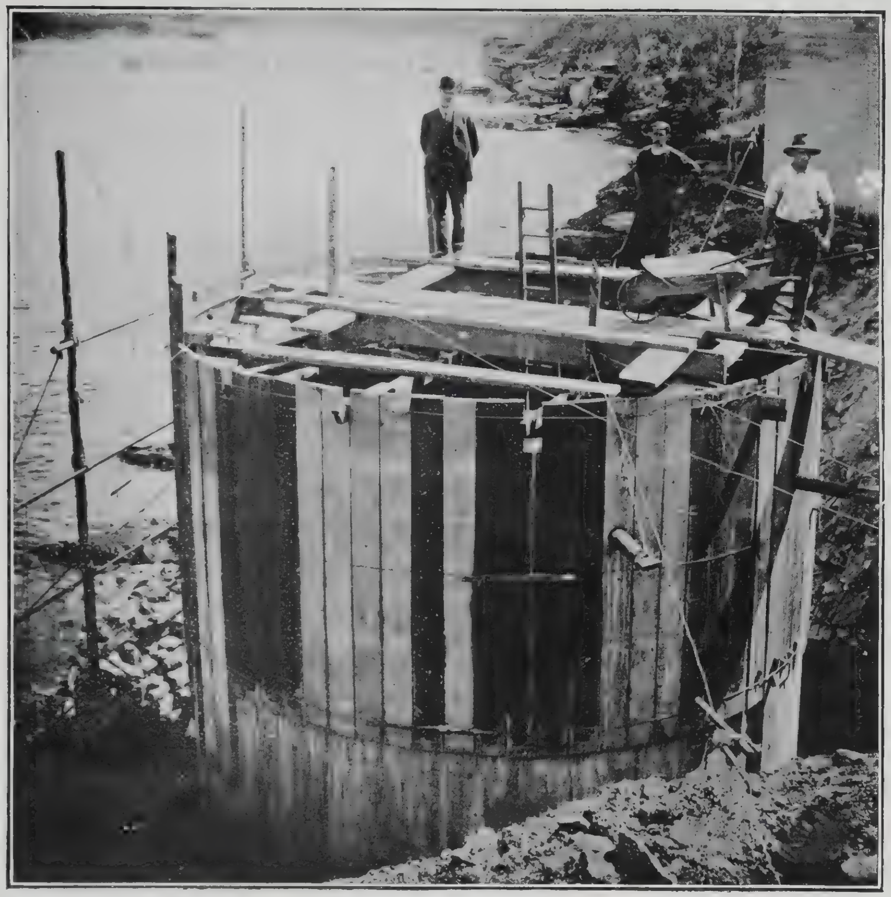




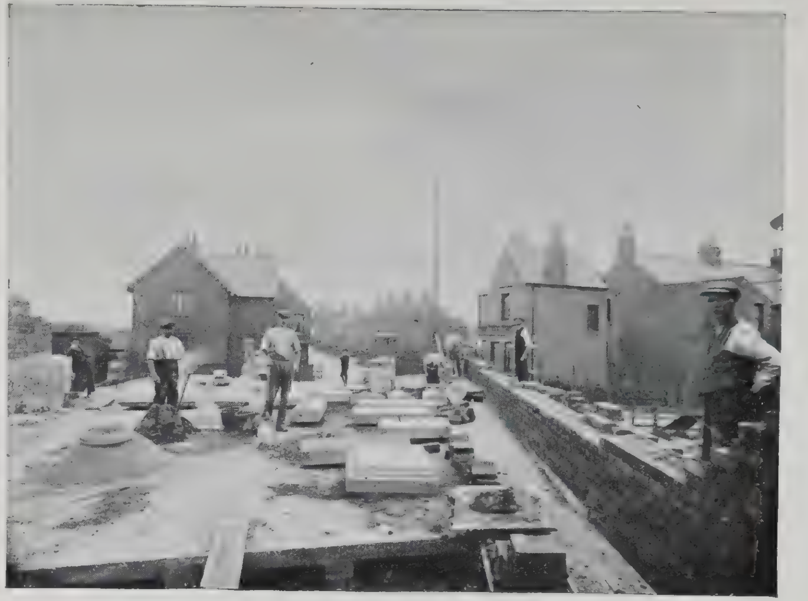
THE TOWER BUILDING, LIVERPOOL, IN COURSE OF CONSTRUCTION. W. AUBREY THOMAS, ARCHITECT.
(Kleine Floors.)



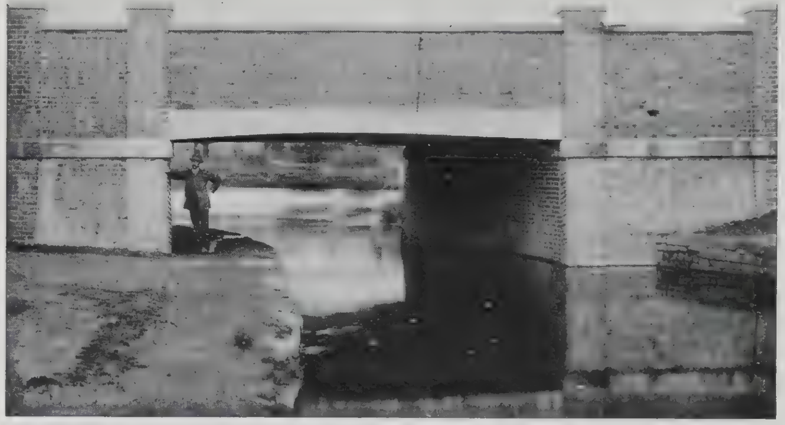
THE WESTMINSTER TRUST BUILDINGS, BROADWAY, WESTMINSTER.
(Kleine Floors.)



Reinforced Concrete Tanks.
MANLEY GAS WORKS, SIDNEY, AUSTRALIA. J. A. M. AULIFFE, ENGINEER.

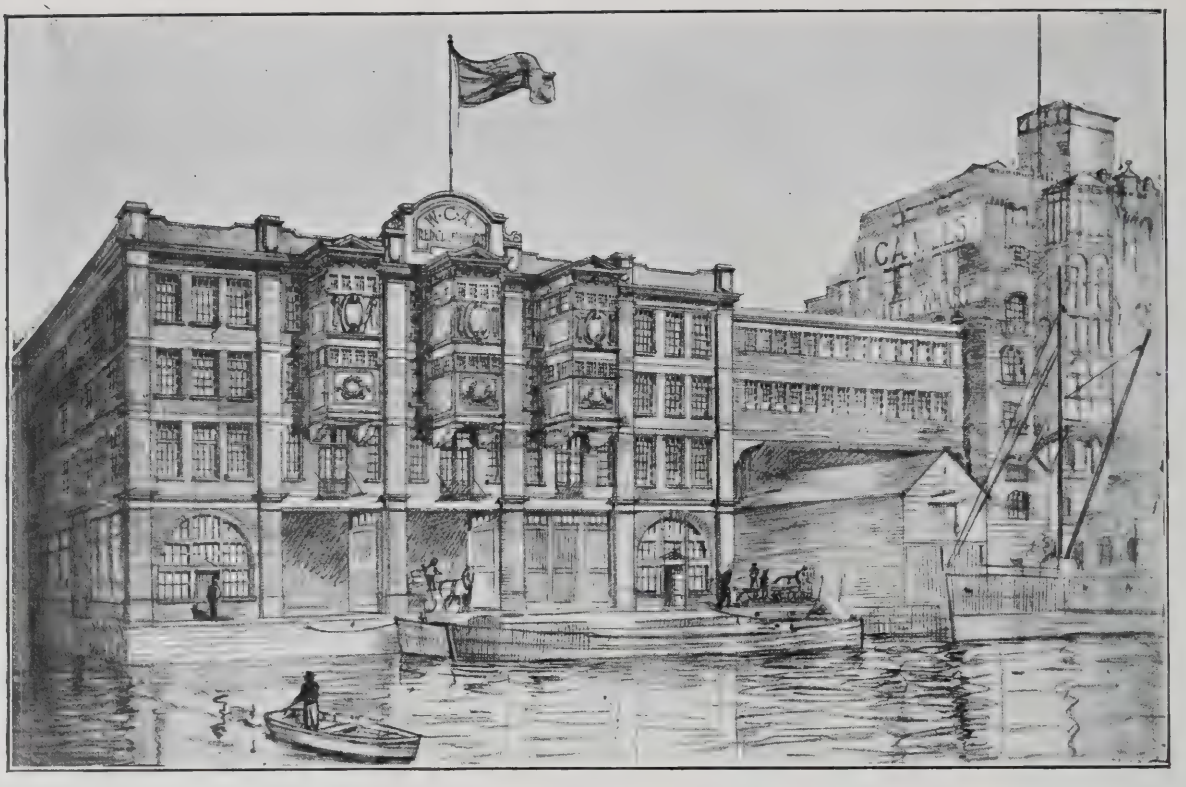


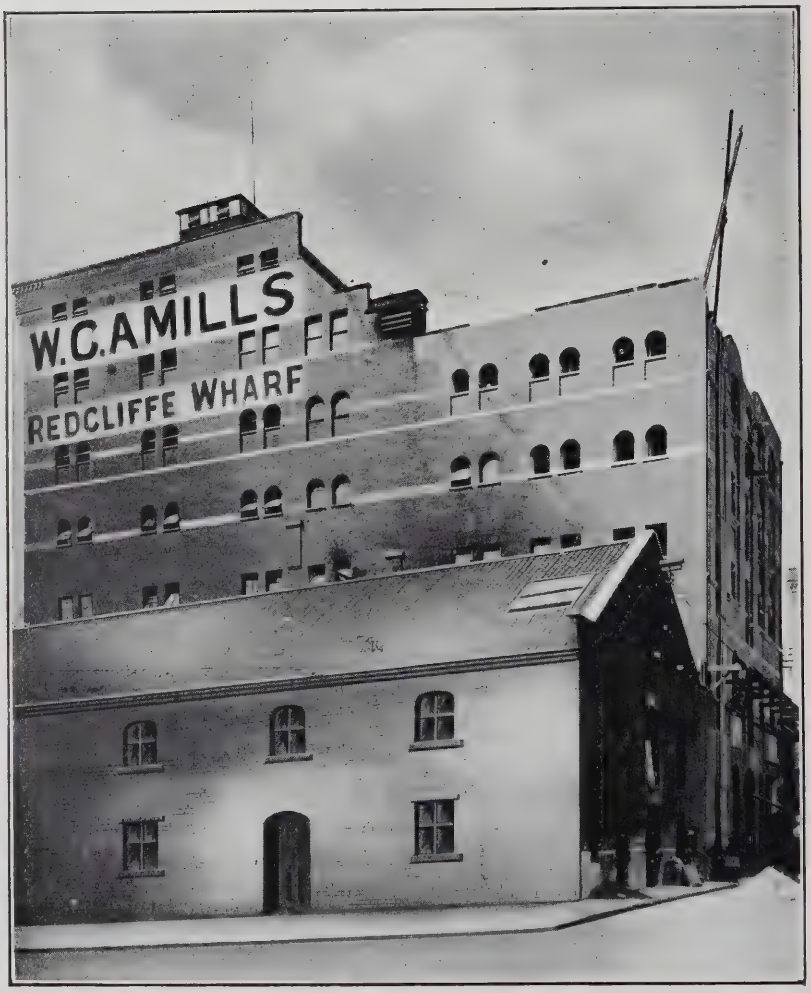
Laying Reinforcement in Parapet Wall.



Completed Bridge.
BRIDGE AT EAST RETFORD IN REINFORCED BRICKWORK. J. D. KENNEDY, BOROUGH ENGINEER. H. RICHMOND AND SONS, CONTRACTORS.

(Richard Johnson, Clapham, and Morris's System)





CORN MILL FOR WESTERN COUNTIES AGRICULTURAL ASSOCIATION, LIMITED, BRISTOL. W. H. BROWN, M.S.A., ARCHITECT.
(Richard Johnson, Clapham and Morris's System.)

ENGINEERING WORKSHOPS, SILVERTOWN.

This building, which was completed at the end of January, is erected on the Frazzi system. Its length is 214ft., width 45ft., including the annexe, with an average height of 34ft. The whole is carried on a reinforced concrete raft especially designed for bearing loads put on by a 10-ton crane. The floor of the building also carries a number of heavy machines. The building is steel framed, the stancheons being of the necessary dimensions to carry the travelling crane above mentioned. The walls are formed of 3-in. Frazzi slabs jointed in cement, and left bare both inside and out, showing the pink terra cotta colour of the material.

The slabs are 2ft. long and 10ins. wide, with hollows throughout the length, the thickness of the terra cotta material not exceeding ⅜in. in any part. The whole of the steel work externally is covered with casings of Frazzi material, so that none of it is exposed, with the exception of the down pipes to the gutters. The roof is of the saw tooth type, the south slopes being also covered with Frazzi special roofing slabs, 1½in. thick, in 3ft. lengths. The slabs are carried on T iron rafters spaced 3ft. centres, and are covered externally with Major's double Roman tiles. The gutters are formed of asphalt bedded on Frazzi slabs. The roof of the annexe is flat, and is formed of Frazzi floor slabs, 3ins. thick, 3ft. 4ins. long, carried on rolled steel joists, the exterior being covered with asphalte laid direct on to the Frazzi material. A concrete raft is laid over the floor of the whole building, that portion which forms the floor of the annexe being supported by piles, while the floor of the main building is constructed with sufficient strength to dispense with piles entirely. The laying of the concrete, which is formed of broken brick, sand, and Portland cement, was done in one operation, without any cessation whatever, so that no setting had occurred at any point before the next portion was thrown in. The whole is therefore one continuous mass, without joints.

The cost of this building complete, including the wood block floors, the piles under the annexe, the concrete raft, the whole of the steel work, also the walling and roofing, tiles, sashes, glazing, asphalt doors, gutters, tanks, etc., amounted to the sum of between £4,500 and £5,000, which, considering the exceptional strength required in the building to support the machines and the 10-ton crane, may be considered a very low figure, amounting to not much more than 3½d. per ft. cube.

It is interesting to note that the building has remained perfectly sound and water tight throughout the year, and that no movement of the raft has taken place, in spite of the heavy loads and the vibration to which the whole building has been subjected.

The steel work was, of course, erected by the owners, Messrs. Richard Moreland and Sons, and the Frazzi Fireproof Construction Co., Ltd., carried out the whole of the concreting and building work, other sub-contractors executing the glazing, asphalt, and wood floor.

ENGINEERING WORKSHOPS, SILVERTOWN, LONDON, E. (Frazzi Construction.)

CONCRETE AND STEEL IN 1909.

During the past year the use of concrete for many and various purposes showed no diminution, and a steady growth of reinforced concrete as a method of building construction was everywhere noticeable, it having taken its place in ordinary building practice, although it is now only a few years since it was practically unknown in this country. Although the use of steel has been more extensive in the past year perhaps than in any previous year, we are becoming so used to reinforced concrete construction that we do not so easily perceive an advance. A few examples at one time attracted much attention, but so many buildings have been erected in the past year (though fewer, perhaps, than in the previous year), and there are consequently few outstanding features that can be singled out in a review of this character. The progress, however, that has been made in connection with the use of concrete for all purposes has resulted in the formation of a special society for the discussion and general enquiry into all aspects.

The Concrete Institute.

The inception of the Concrete Institute was chronicled in our review last year, but the Society was then merely in its beginnings, for the first meeting of the council took place only on July 21st, 1908. At the end of that same year it had about 450 members. In the past year the membership has been about doubled. This is not the only respect in which the Concrete Institute may be said to have had a very prosperous year. Its meetings have been very successful in the production of many interesting papers and discussions.

The objects of the Institute are: To advance the knowledge of concrete and reinforced concrete; to provide a means of communication between persons interested in the subject, and to hold meetings for the discussion of practical and scientific matters bearing on the general application of the materials, and these objects are being well served. There is no doubt, for instance, that the Institute has done something to advance the knowledge of concrete and reinforced concrete; and altogether it seems to have fairly started upon the useful career that was anticipated for it.

Standing committees have been formed for science, Parliament, reinforced concrete practice, plain concrete, and tests, and that these committees, each with its chairman and secretary, are doing good service, may be inferred from a single instance. The London County Council General Powers Bill (1909) for the amendment of the London Building Acts, contained clauses governing the erection of steel-frame buildings and reinforced concrete structures. The original draft was opposed by the Concrete Institute, the Royal Institute of British Architects, and other professional bodies, and a delegate from the Concrete Institute was examined in committee, and as a result of the Institute's action various alterations were made which improve the Bill, from the point of view of those specially concerned and the professional public. Moreover, the name of the Concrete Institute was included among those societies who had to be consulted before any regulations were brought into force by the London County Council. In this way official recognition has been given to the Concrete Institute by Act of Parliament.

Standard Calculations.

This is only one line of the activity of the Parliamentary Standing Committee. The Science Committee of the Concrete Institute, on the other hand, has been chiefly concerned with the drafting of standard algebraic calculations and notations for reinforced concrete. The Institute moved in this matter at quite an early stage, before it was approached by the International Commission on Reinforced Concrete to pass its opinion on the point of a suggested uniform notation. The view of the Concrete Institute was, that it was inadvisable to have an International notation, as the symbols should be an abbreviation of the initial letters of the words describing certain mathematical quantities, and the Continental terms not being quite similar to those of English-speaking countries, it was held that, though a notation might usefully be devised for Continental use, a separate notation would be better for England and America. The Science Committee considered the matter in detail, and drew up a standard list of symbols, which were submitted to the International Commission on Reinforced Concrete at its meeting at Copenhagen in May of the past year, and the American Institutions are now being approached with a view to this notation receiving the stamp of official approval in America as well as in England. Considering the amount of literature on the growth of a proper theoretical knowledge of reinforced concrete, the work which the Concrete Institute has undertaken in this respect must become of increasing value to both the student and the practitioner.

Practical Investigations.

Sub-committees of the Science Standing Committee were formed to deal with the question of the rusting of steel in concrete, and with the present practice in respect to the bearing power of reinforced concrete piles. These sub-committees are collecting a good deal of valuable data. The Reinforced Concrete Practice Committee has appointed sub-committees to deal (1) with a practical preventive measure against the expansion and contraction of reinforced concrete floors; (2) a simple specification for foremen, etc., as to the dampness of concrete mixtures for plain concrete and reinforced concrete; and (3) practical methods of fixing these materials. These are all subjects of immediate and general importance. The Parliamentary Committee is also considering the means to get local Bills amended to enable the use of reinforced concrete without the present serious restrictions.

Valuable Papers.

In February last a valuable paper on the commercial aspect of reinforced concrete was read by Mr. Lucine Seraillier; and in March Mr. E. P. Wells delivered a paper on concrete in arched bridge construction. In May a paper was read by Mr. H. K. G. Bamber on the setting of Portland cement as a means of preventing expansion.

Visits.

In the summer, visits were paid to the works of the Associated Portland Cement Manufacturers, Ltd., at Swanscombe; to the reinforced concrete building of the General Post Office extension; and to the Western District Post Office, both of which are situated in London, and have been erected under H.M. Office of Works. In November, the winter session of the Concrete Institute again began with a general meeting, when a lecture was delivered by Mr. Richard L. Humphrey, dealing with the general application of reinforced concrete in the United States.

Science of Design.

The Institution of Civil Engineers has felt the necessity of doing something to place the science of reinforced concrete design on a surer footing, and though the R.I.B.A. Joint Committee of Engineers and Architects, which published a most valuable report on the subject some time ago did the pioneer work, and comprised members who have made a special study of the subject, yet we find only one member, Prof. Unwin, upon the Committee of the Institution of Civil Engineers. The body, as appointed, will no doubt add its quota to the growing volume of responsible professional opinion that reinforced concrete represents a most valuable advance in constructive methods, and one which offers economy, durability, and many other advantages.

The American Society of Engineers, late in the day, proposed also to appoint a similar committee to investigate the subject, and though it consisted of a number of engineers not specially noted as having specialised in reinforced concrete, its report published last year confirmed practically the whole of the opinion of the Royal Institute of British Architects' Committee, and helped to convince even the most conservative members of the profession of the advantages of reinforced concrete.

Concrete at the Building Exhibition.

At the Building Trades Exhibition at Olympia, a large number of the exhibits dealt with concrete and reinforced concrete.

Government Departments and Reinforced Concrete.

H.M. Office of Works have set the official seal upon reinforced concrete construction by applying it in the construction of the extension of the G.P.O., and in the building of the new Western District Post Office. The former is being carried out under Sir Henry Tanner, I.S.O., by Messrs. Holloway Bros., Ltd., contractors for the reinforced concrete work, as well as for the general finishing of the building.

We have referred above to the visit which was paid to this building by the members of the Concrete Institute, and also to their visit to the other building finished this year, namely, the Western District Post Office, which was constructed on the Coignet system by Messrs. W. King and Sons, contractors. That H.M. Office of Works are evidently favourably inclined to reinforced concrete construction may be inferred from the fact that in the past year tenders were invited for the erection of a new Money Order Office at Holloway, which contract was assigned to the same contractors as those employed for the Western District Post Office, this being also carried out by the same architect, Mr. J. Wager, H.M. Office of Works also invited tenders for work at Birmingham, and for the construction of new fireproof roofs to the National Gallery in reinforced concrete.

Local Government Board Apathy

The only official direction in which we have to chronicle a sad lack of appreciation, and apparently a determined effort to stand in the way of progress, is the action of the Local Government Board in refusing to grant loans on reinforced concrete construction for more than about ten to fifteen years. The life of reinforced concrete structures is fully equal to those on which the repayment of loan period is thirty years, and though the action of the officials of the Local Government Board has been called in question in Parliament, and whereas other branches of the public service, such as the War Office, the Admiralty, and H.M. Office of Works, have utilised the material extensively, yet nothing seems to move the Local Government Board. We hope that in due time this body may be persuaded of the error of its ways, but it is positively ridiculous for one official body thus to stand in the way of progress and set its face against scientific opinion.

The amendment of the London Building Act above referred to will have a great influence on building construction in London, and, perhaps, indirectly throughout the country. Considerable agitation is being directed to the endeavour to promote steel-frame construction in London in which the whole of the load is carried upon the steel frame, so that the walls can be reduced to a minimum thickness, and the necessity of constructing them in the same thickness from top to bottom, as required by the old London Building Act, obviated.

Steel-framed Buildings.

In connection with steel-frame buildings, reinforced concrete has found much favour for the construction of floor-slabs; but attached to the clauses of steel work construction we find others enabling the London County Council to permit the erection of reinforced concrete structures; and this we think perhaps of more importance, for it seems that reinforced concrete can successfully compete with steel work construction, and the latter will therefore occupy probably a secondary place. The rules have not yet been drafted, but buildings of the new construction are now permissible, and this permission should increase the use of reinforced concrete enormously.

Notable Examples.

In respect to other notable buildings in construction in the past year, we may first of all refer to the new Wesleyan Memorial Hall, in Westminster, which is being erected on the Kahn system. In this building there is a very large concrete dome, besides other interesting structural members. Another very interesting building in reinforced concrete is the new Y.M.C.A. building in Manchester, also on the Kahn system, in which the beams are of enormous size, as certain upper floors have to support unusual loads. At Kinlochleven, extensive works of reinforced concrete are being erected on the Coignet system for the British Aluminium Company. The culvert for the supply of water for power purposes in connection with the same is also formed of concrete reinforced with expanded metal.

Bridges.

An interesting road bridge, reinforced with expanded metal, has been erected at Thorverton, in Devonshire. Other bridges have also been carried out with reinforcement in expanded metal, a girder bridge at Chalderton, near Salisbury, for example. Tenders were invited in the past year for a large 134ft. single-span arch, 80ft. in width, to cross the river Mersey at Warrington. The system of reinforced concrete upon which this will be built has not yet been decided, but it shows the magnitude of the works which are being projected in this new construction. An interesting controversy took place in connection with the construction of bridges, the matter being one of dispute between the respective advocates of reinforced concrete and of steel work, for the re-erection of the bridge over the river Suir at Waterford, in Ireland. The original proposal for a steel structure may have been somewhat extravagant, but certainly the saving offered by the reinforced concrete scheme was very considerable, and it is probable that reinforced concrete will be adopted, though efforts are being made to reduce the cost of a steel structure. It has been decided to build a new bridge across the River Nore at Kilkenny, in place of the existing one. The total length is 196ft., and the width 30ft., and the centre arch will have a span of 140ft. In contrast with the action of the English Local Government Board, we may record the action of the Irish Board of Public Works, who have shown their confidence in reinforced concrete by extending the repayment of the necessary loan to 50 years.

As regards plain concrete, the most extensive construction completed this year is Dover Harbour, which was opened by H.R.H. the Prince of Wales. This is a gigantic work, but, of course, the use of concrete in mass or in monolithic blocks is not new. The example at Dover, however, is a striking one in respect to the great advantages which concrete offers to modern engineers.

Miscellanea.

Among the interesting applications of concrete is the construction of reinforced concrete pipes for water mains, sewers, etc., and the construction of reinforced concrete telegraph and electric power transmission poles. The Bonna and Siguit systems of making reinforced concrete pipes have received extended application in the past year. Concrete blocks for the construction of walls of all kinds have been proved now to be economical and suitable for the construction of small and large properties, from sheds and dwelling-houses up to churches and other monumental structures, and their use is growing. The efforts of the pioneer concrete block machine makers are gradually being awarded with success. We may refer to only that of the Newbiggin Colliery Co., Ltd., recently placed with the Wingett Concrete Construction Co., Ltd., for 602 miners' houses. Another interesting application is the use of reinforced concrete for the construction of fences, posts, etc. These have been extensively used in the United States, and they are coming into use in this country. An experimental fence has already been erected for the Great Eastern Railway Company.

Among the examples of reinforced concrete which have been erected in London during the last year, may be mentioned the recent plumbago mill, erected at Battersea for the Morgan Crucible Company, Ltd., the contractors for which are the Empire Stone Company, the reinforcement being patent indented steel bars.

Notable Works of the Year.

Among the numerous structures erected on the Kahn system in the past year, we may specially refer to as worthy of note, is a stand for the Rugby Football Union, the stores for the Bank of England at Roehampton, in both of which cases the Cubitt Concrete Construction Co. were the contractors; bathing pond at Castleton Baths; New South American Bank, Broad Street, London; block of warehouses at Watling Street; and the Kodak Company's factory at Harrow (D. G. Somerville and Co., contractors).

The British Reinforced Concrete Engineering Company, Ltd., had a successful year, their works comprising large railway culverts at Bromborough, bridges at Hallington and Swimburn, water towers at Castle Eden and Trafford Park, reservoirs at Titley and Huddersfield, warehouses at North Wales and on the Thames Embankment, machine shops and stores at Gourock, chemical works at Ditton, and other minor works.

On the Coignet system, in addition to above-mentioned works, were carried out workshop floors for Messrs. Henry Atkinson and Sons, Carlton Hall, Leeds; new pavilion for the Leeds Golf Club, Ltd.; floors at the Leeds Maternity Hospital, swimming bath at Yeadon and Guiseley Schools; the floors and roof for an hotel at Boar Lane, Leeds.

Messrs. The Empire Stone Co., Ltd., have been carrying out new offices for the Royal Mail Steam Packet Company at Kingston, Jamaica, and an extension to the Dunlop Rubber Company's works in Castle Lane, Birmingham.

The United Kingdom Fireproofing Co., Ltd., have carried out various works, among which may be mentioned the Doncaster Racecourse stands, New Barnet Church, Manchester Telephone Exchange, Epps's Cocoa Factory, and Panton Street Brewery, Cambridge, also the Northern Assurance Buildings at Glasgow.

The Patent Indented Steel Bars have been employed in many buildings in the past year—too numerous, in fact, to be mentioned in detail, but we may refer specially to the Automobile Club in Pall Mall, London, the floors and retaining walls of which are of concrete reinforced with indented bars. Water towers at Rhyl and Leicester, retaining walls at Wembley, sea wall at Teignmouth, Fortt's premises at Bath, baths at Heeley and Glossop Road and Madeley Street, Sheffield, floors of schools at Maidstone, Ramsgate, Bromley, and Sheerness.

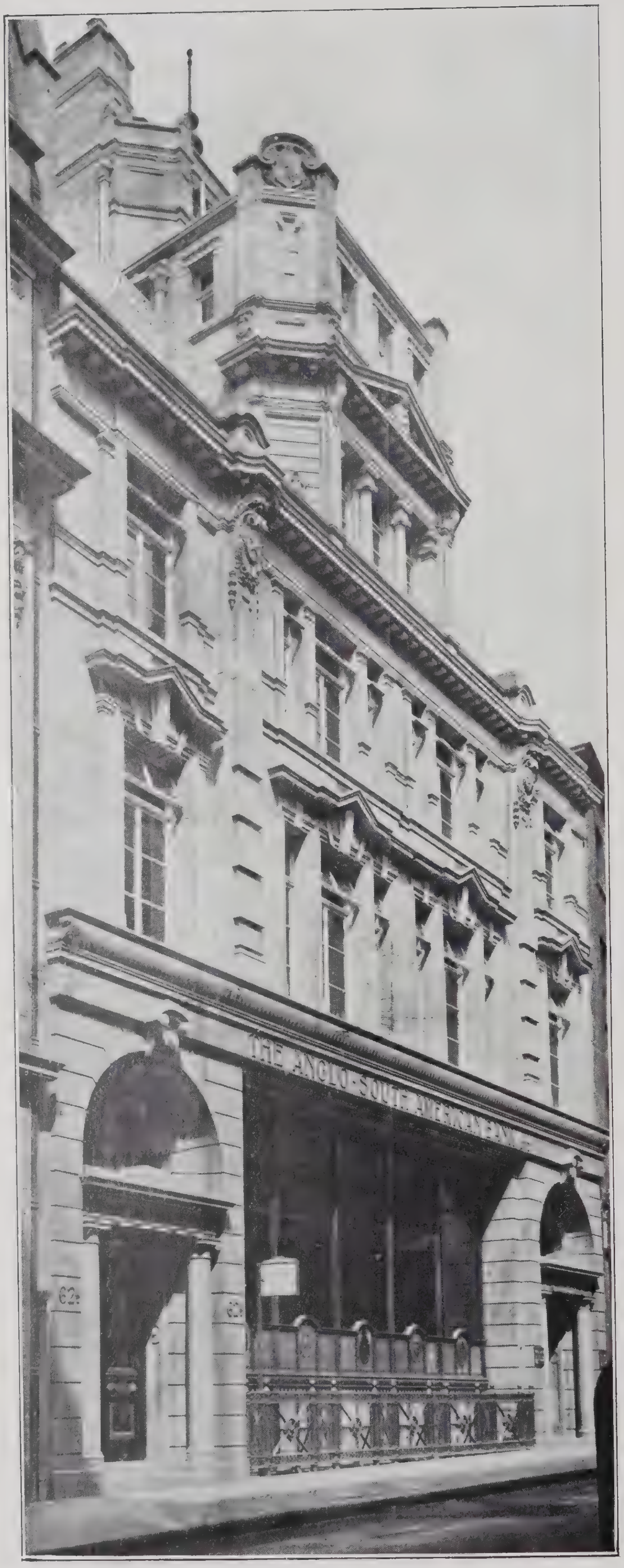
Messrs. The Cubitt Construction Co., Ltd., carried out some large works for Messrs. Whitbread and Co., at Chelsea, in addition to those already mentioned.

Messrs. D. G. Somerville and Co. carried out a viaduct with reinforced concrete poles for the Norwich Corporation, water tower at Portslade, and a water tower at Leicester, and Chilham bridge.

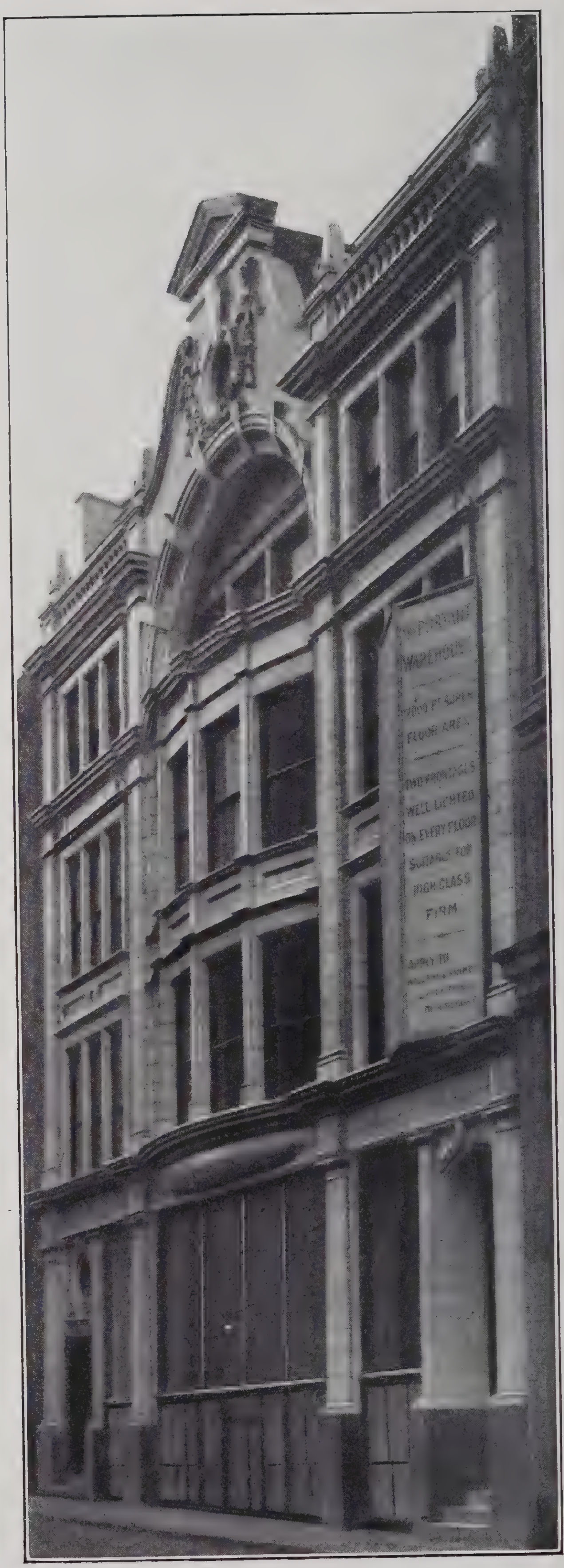
The Armoured Tubular Flooring Co. carried out a factory at Bromsgrove, floors of a boot factory, and Bromsgrove Secondary School at Sowerby Brigg, at Foundry, Belfast, at the new Royal Infirmary, Sheffield, and at the new Secondary Schools at Barnstaple, and at the Great Western Hotel at Fishguard Bay.

Messrs. Leslie and Co., Ltd., carried out percolating beds at Kempton Park, at Staines in connection with works for the Metropolitan Water Board, foundations to the new South Kensington Post Office, the Strand Palace Hotel, London; bridge work at Barton Mills for the West Suffolk County Council; new factory at Bow for Messrs. Bryant and May, Ltd.

The Expanded Metal Co. have so many buildings as to preclude a list, but eleven important works are shown in the following pages.

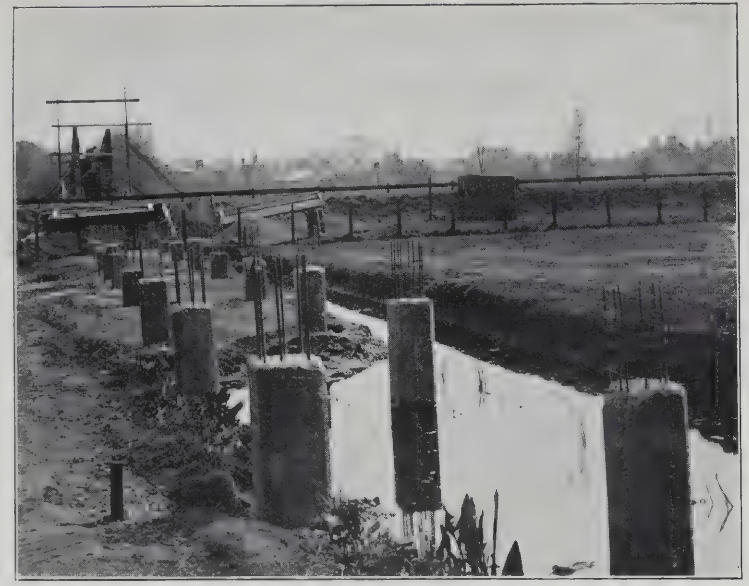


ANGLO-SOUTH-AMERICAN BANK, BROAD STREET LONDON E.C.

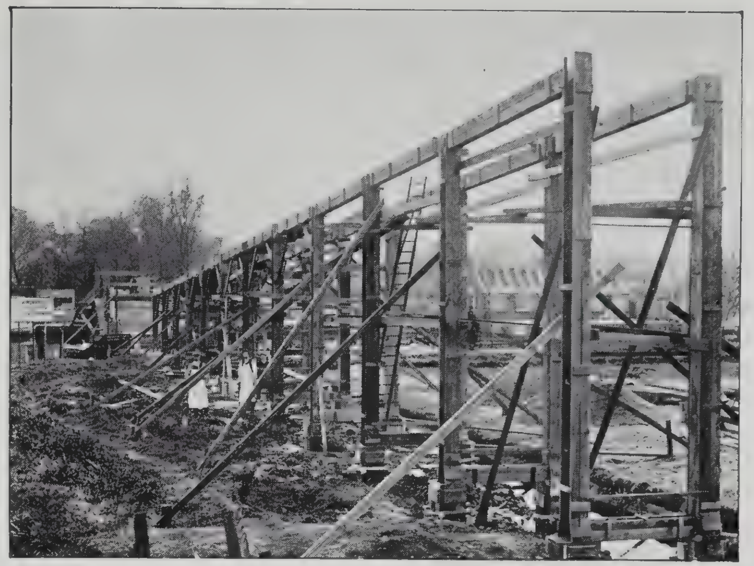


WAREHOUSES, WATLING STREET, LONDON E.C.

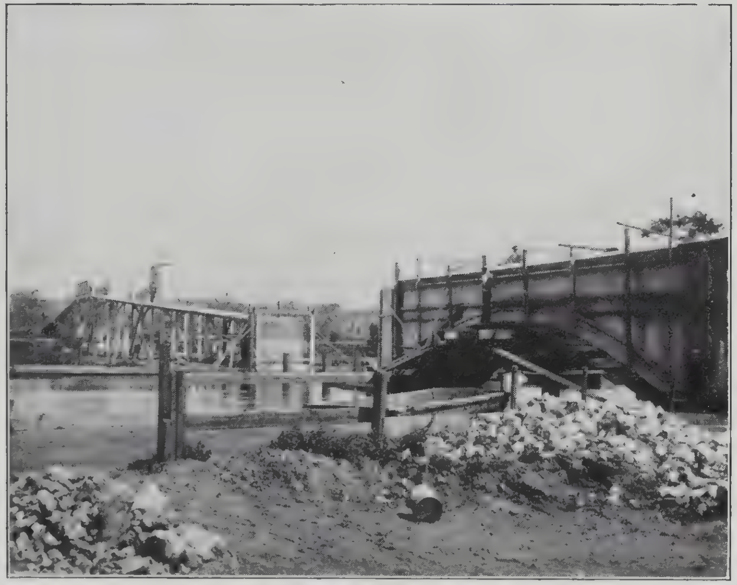
(Kahn Reinforcement.)



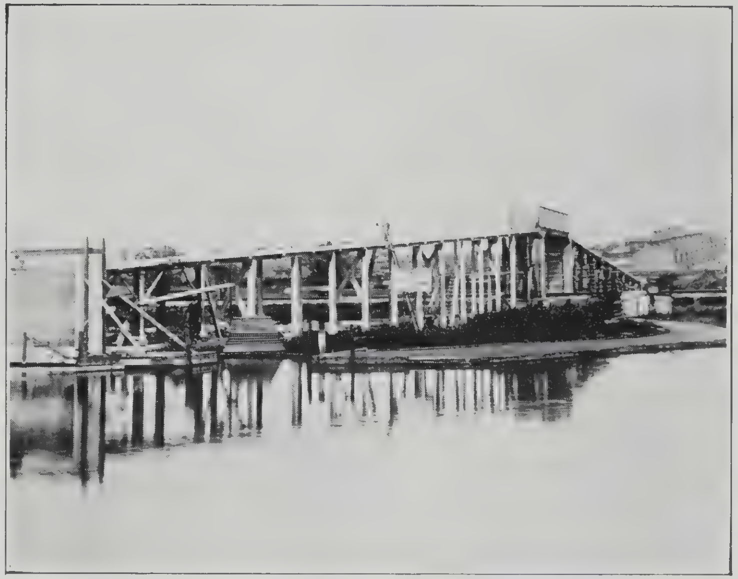
Piles for Foundation.



Centering in Position.

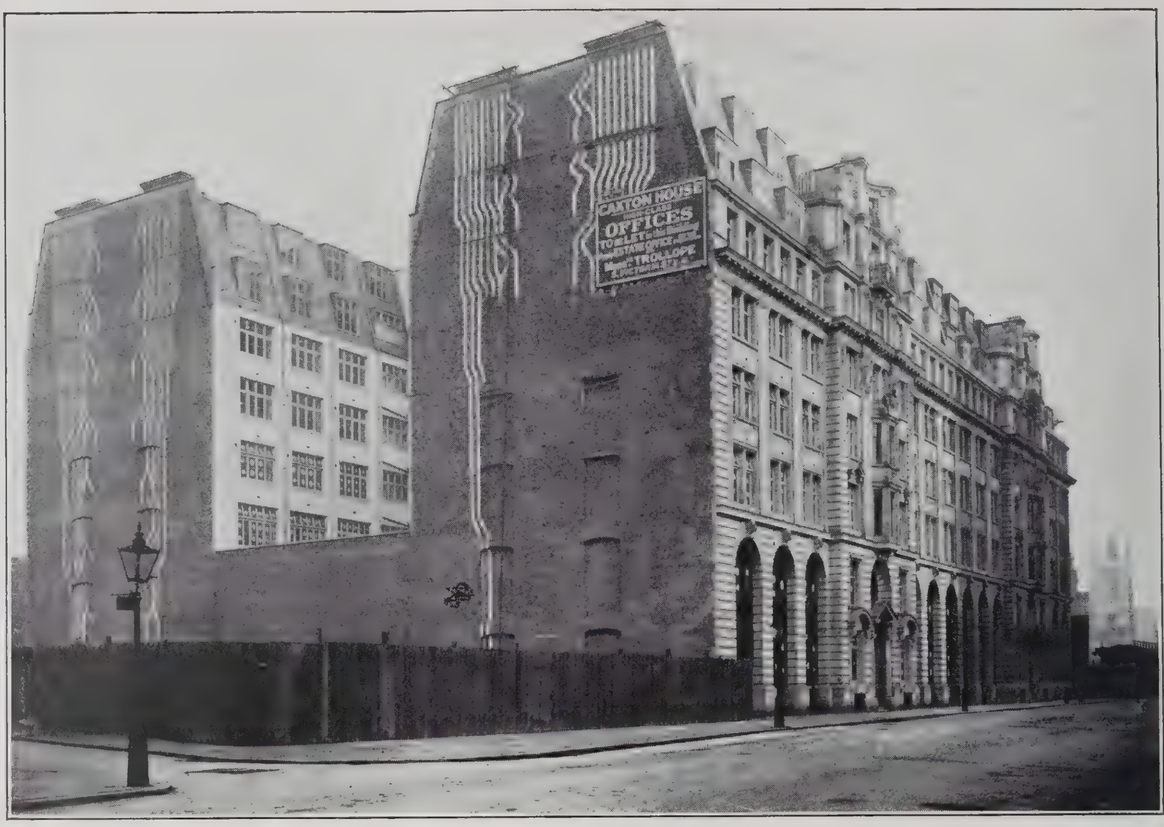


Nearing Completion.

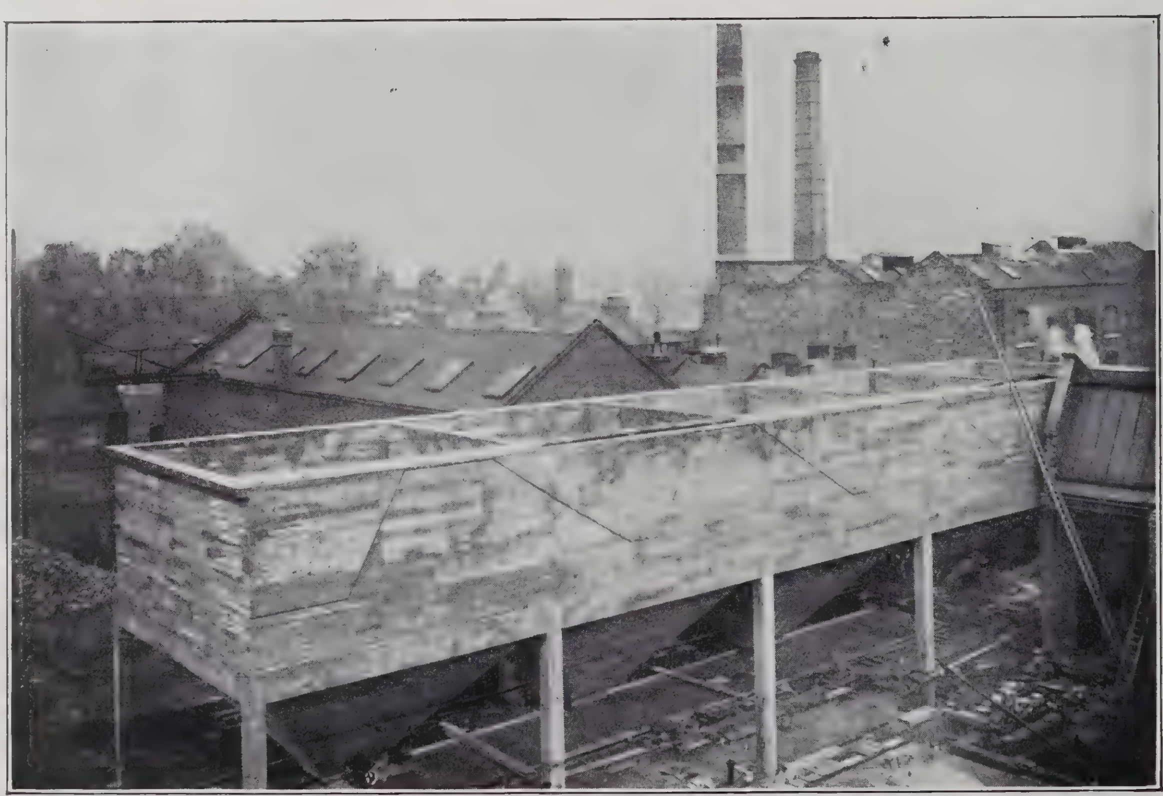


Viaduct Completed.

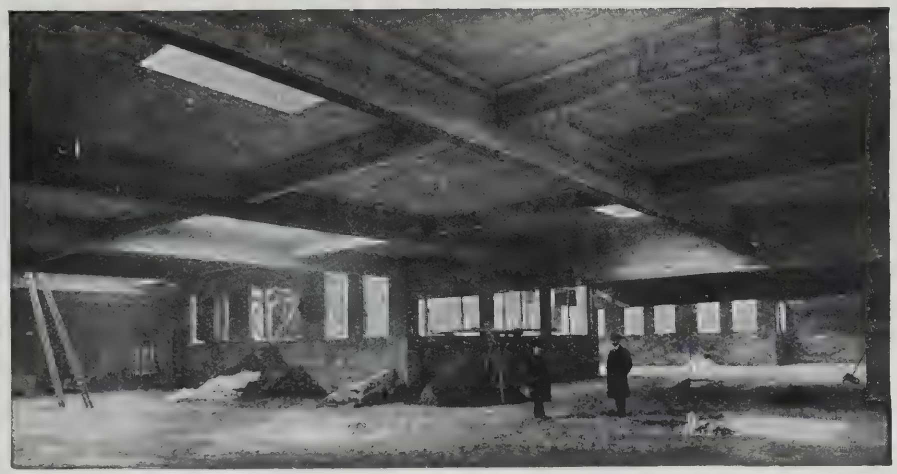
THE DOLPHIN BRIDGE AND VIADUCT, CONNECTING LOWER HELLESDON WITH_NORTH HEIGHAM, NORWICH. A. E. COLLINS, M.Inst.C.E., ENGINEER.
(D. G. Somerville and Co., Contractors.)



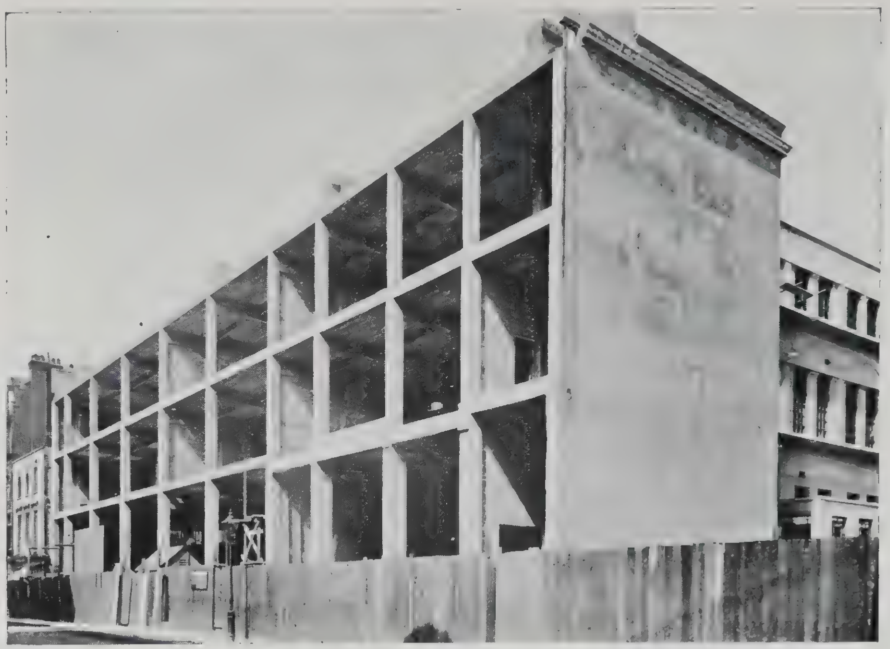
CAXTON HOUSE, WESTMINSTER, SHOWING NEW WEST BLOCK. J. S. GIBSON, F.R.I.B.A., ARCHITECT.



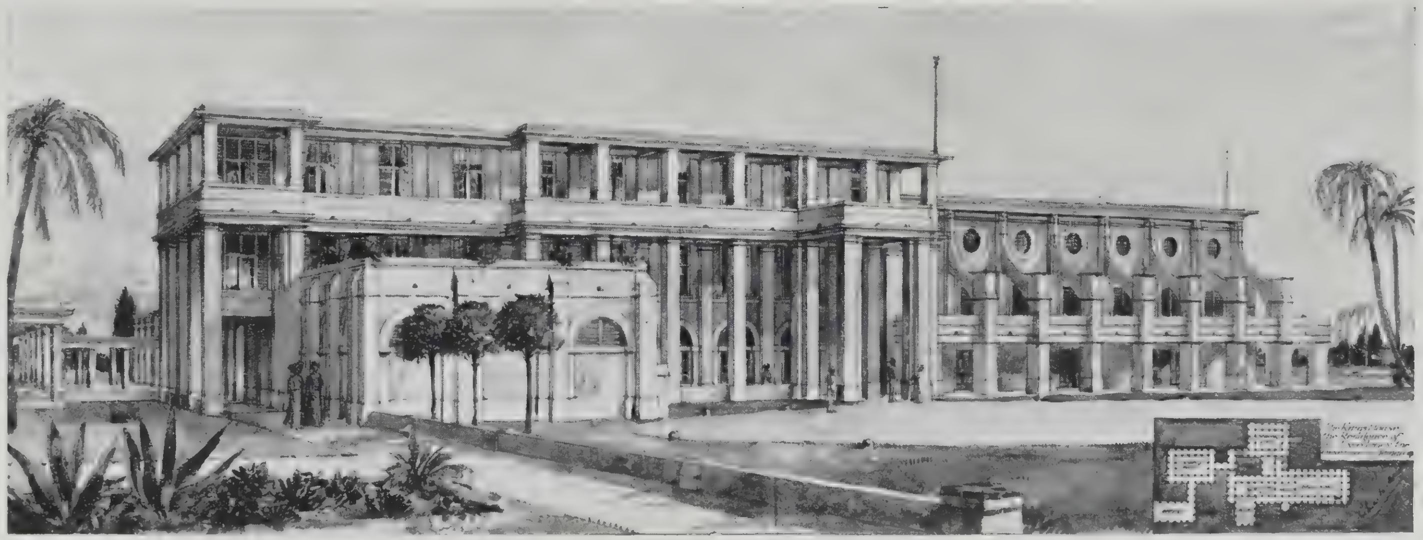
COAL BUNKERS AT HAMMERSMITH FOR THE METROPOLITAN WATER BOARD.
Wm. B. BRYAN, M.Inst.C.E., CHIEF ENGINEER.
(Holloway Bros., Ltd., Contractors.)



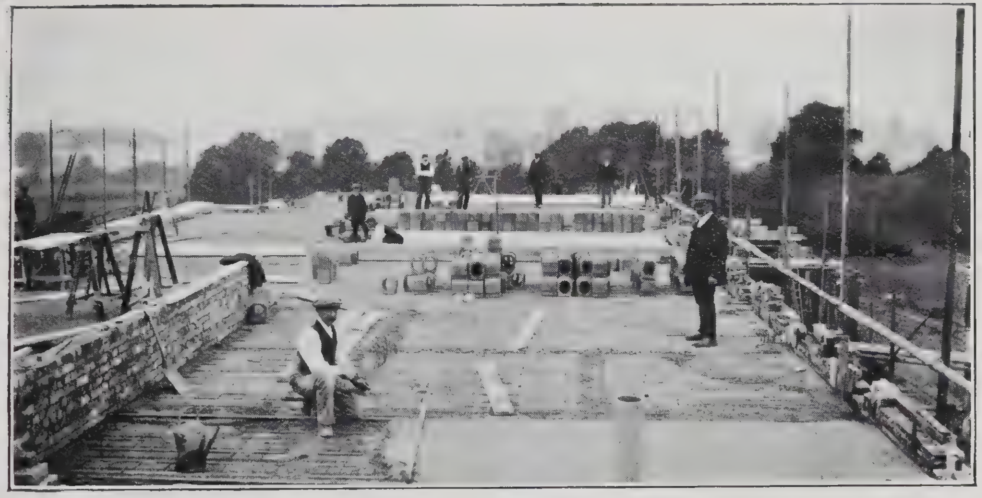
WESTERN DISTRICT POST OFFICE, WIMPOLE STREET, LONDON: INTERIOR OF GROUND FLOOR. J. WAGER, A.R.I.B.A. (H.M. OFFICE OF WORKS).



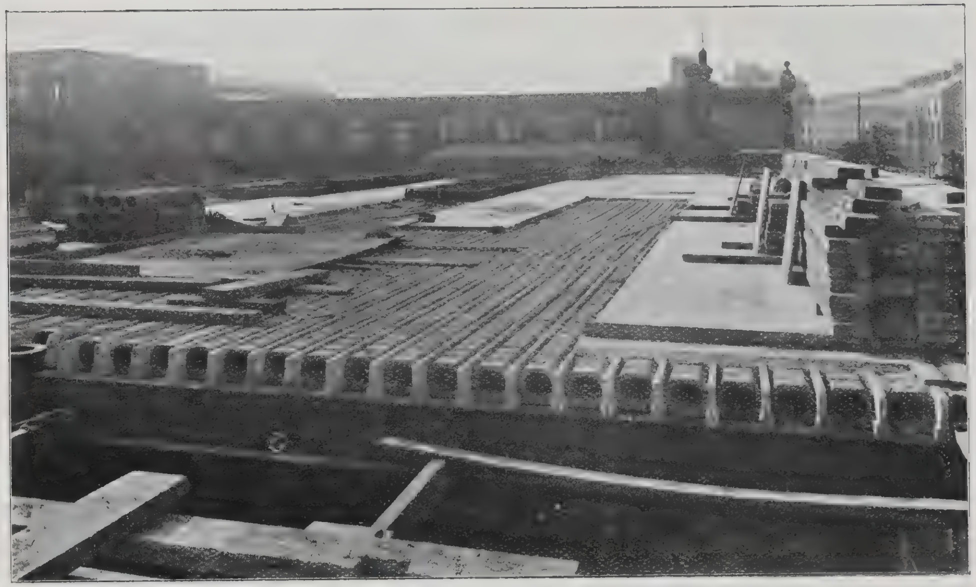
WESTERN DISTRICT POST OFFICE, WIMPOLE STREET, LONDON. J. WAGER, A.R.I.B.A. (H.M. OFFICE OF WORKS).



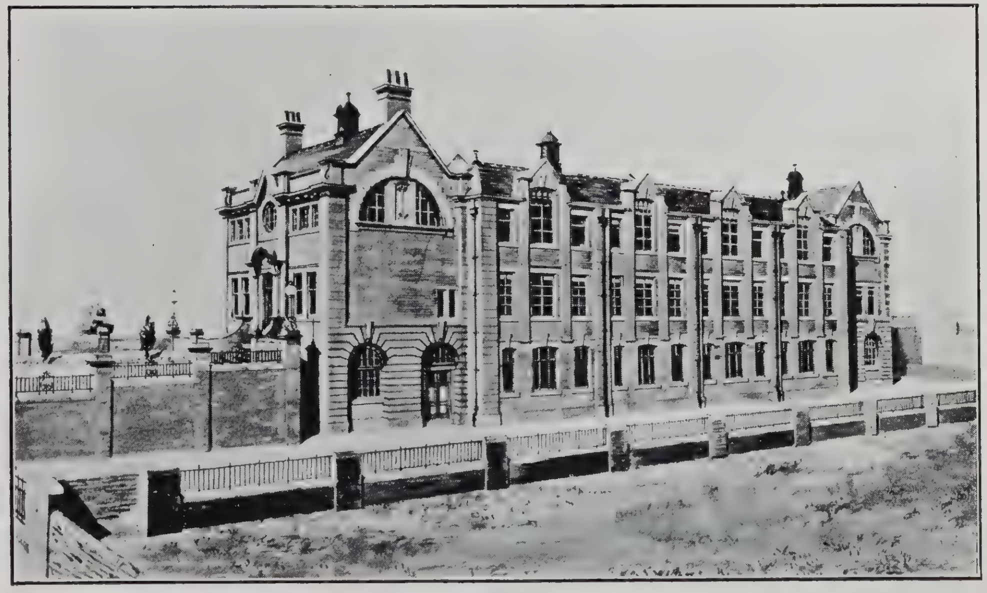
THE KING'S HOUSE, KINGSTON, JAMAICA. NICHOLSON AND CORLETTE, FF.R.I.B.A., ARCHITECTS.
(Coignet Reinforcement.)



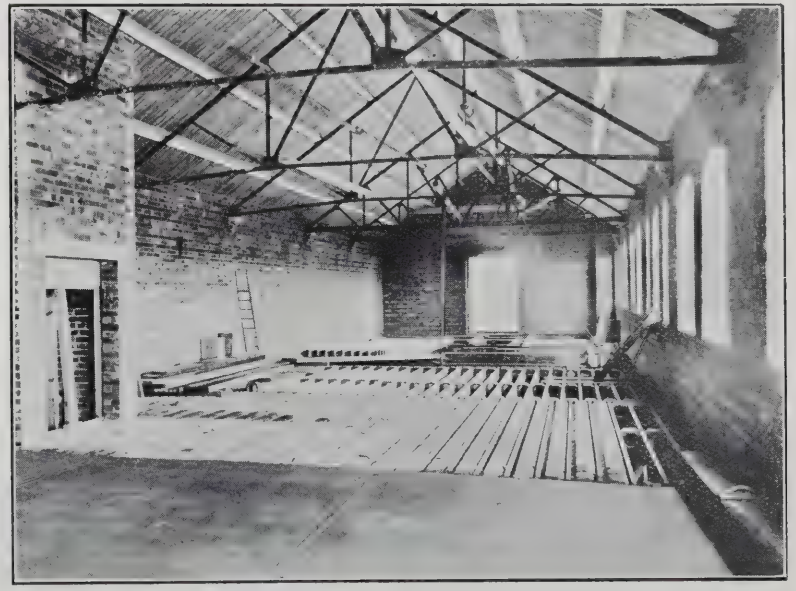
NEW SECONDARY SCHOOLS, BARNSTAPLE. PERCY NORRIS, COUNTY ARCHITECT.
MAXIMUM SPANS, 23 FEET.



ALBERT FOUNDRY, BELFAST: FLOORS IN COURSE OF CONSTRUCTION. SPANS 20 FEET.

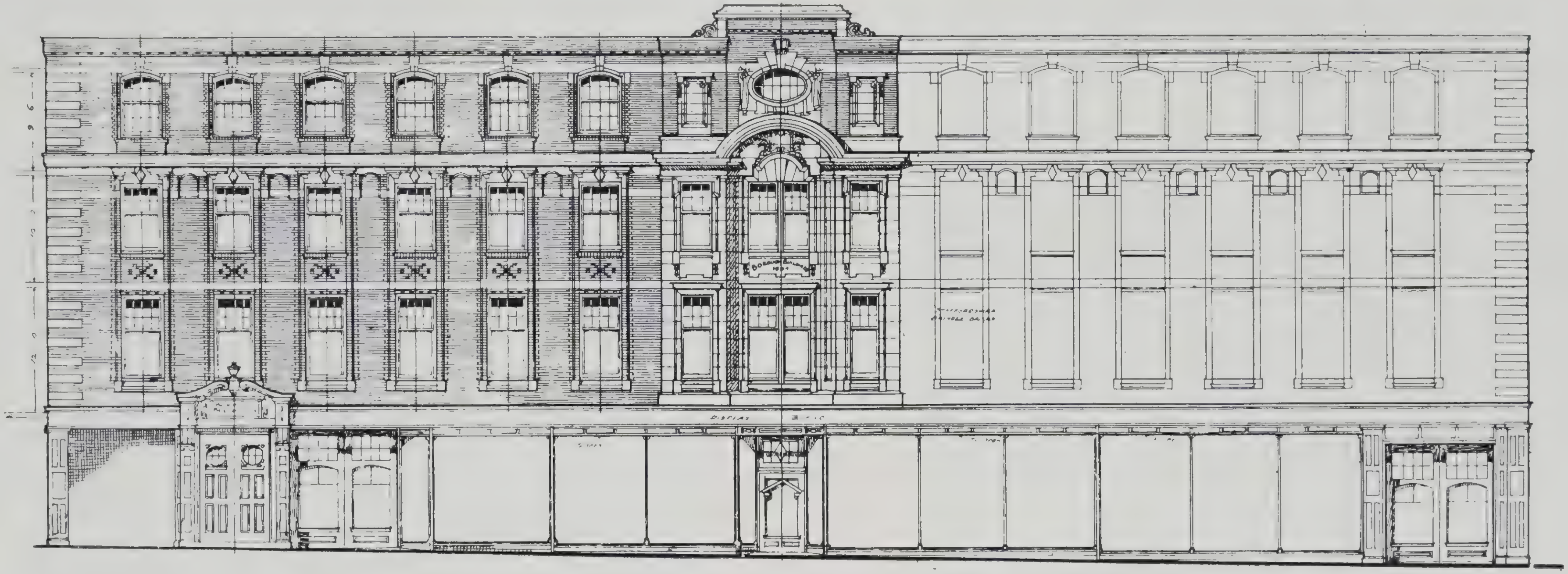


SECONDARY SCHOOL, SOWERBY BRIDGE, LONGBOTTOM AND CULPAN, ARCHITECTS.



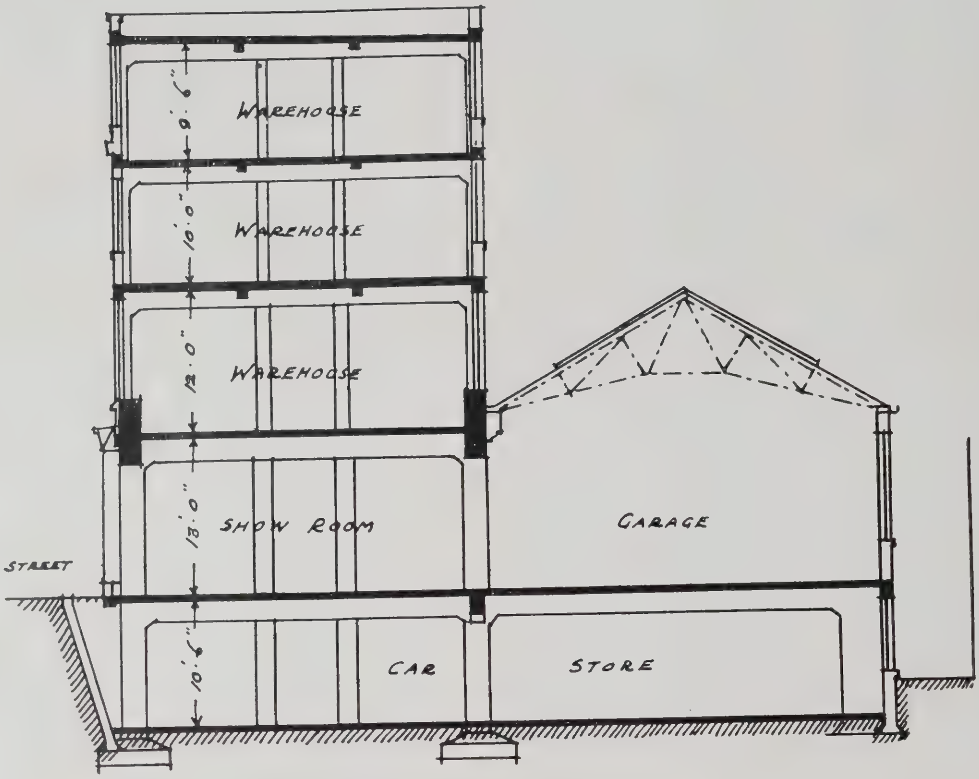
BOOT FACTORY, BROMSGROVE: INTERIOR. A. ANDERSON, ARCHITECT.
(*Note.*—Nearest bay of the floor is completed.)

(Armoured Tubular Floors.)

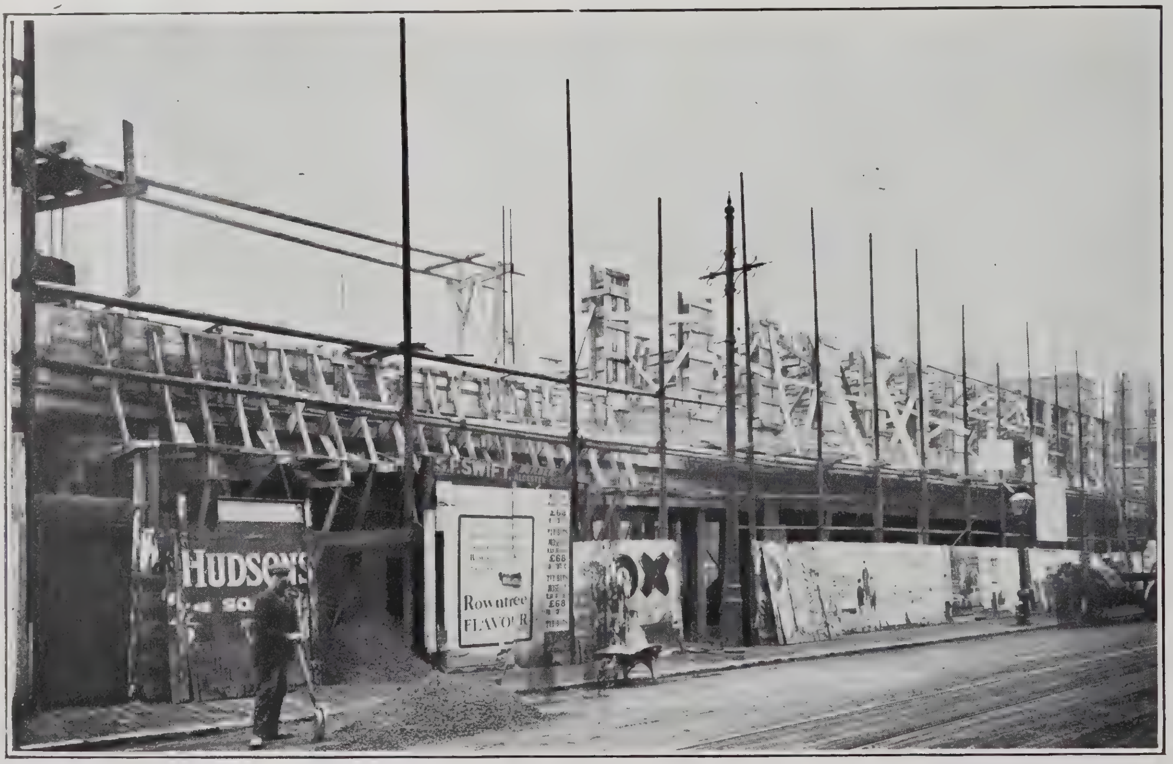


FRONT ELEVATION

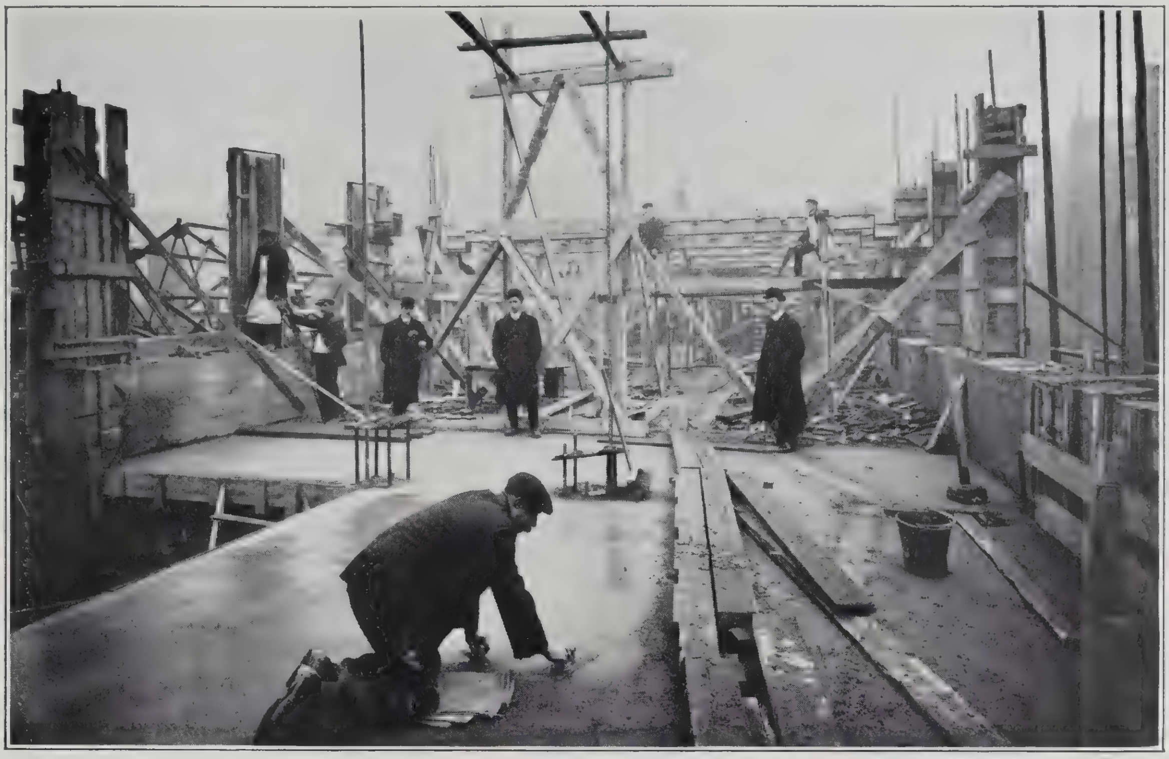
NEW GARAGE AND WAREHOUSE ROOMS, JOHN BRIGHT STREET, BIRMINGHAM. MARCUS O. TYPE, A.R.I.B.A., ARCHITECT.



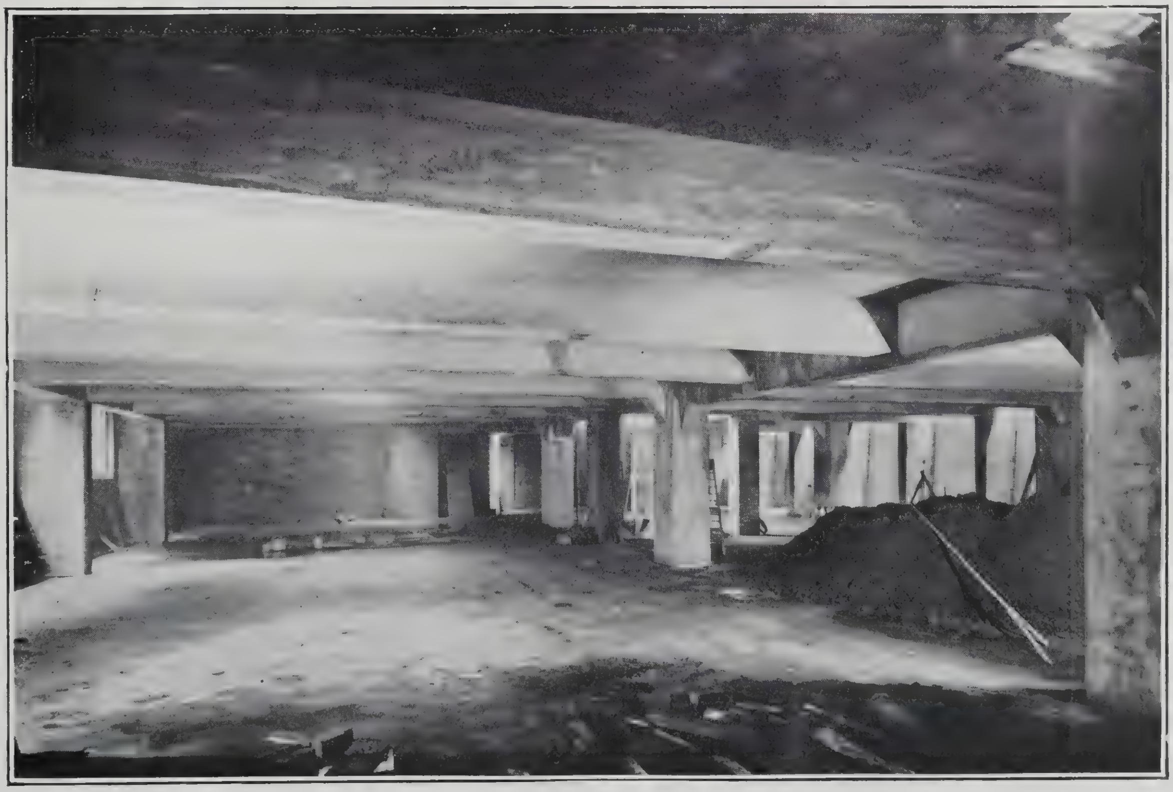
SECTION A.A



NEW GARAGE AND WAREHOUSE ROOMS, JOHN BRIGHT STREET, BIRMINGHAM.
MARCUS O. TYPE, A.R.I.B.A., ARCHITECT.



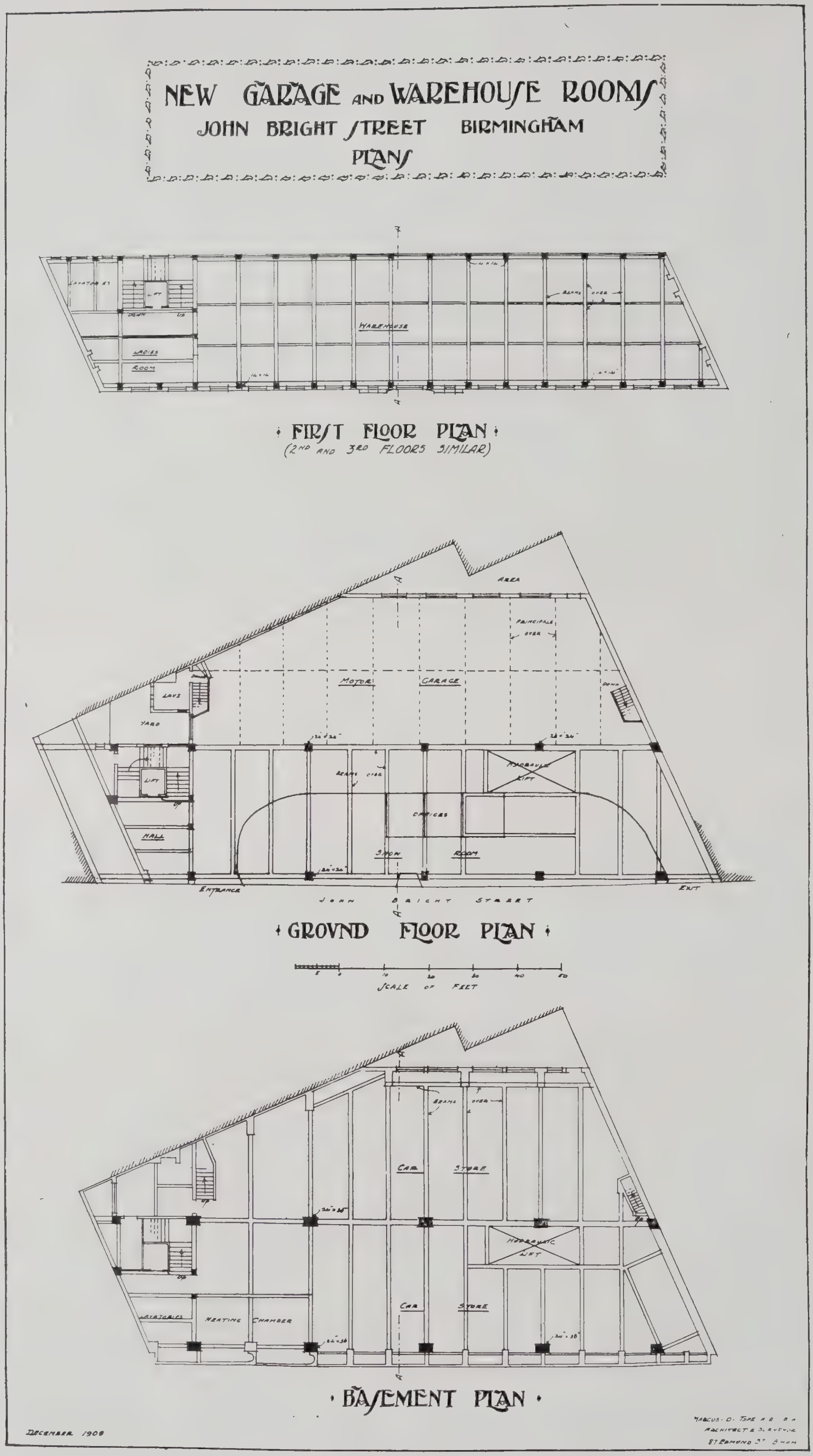
View showing first floor, staircase well on the left.



View of basement.

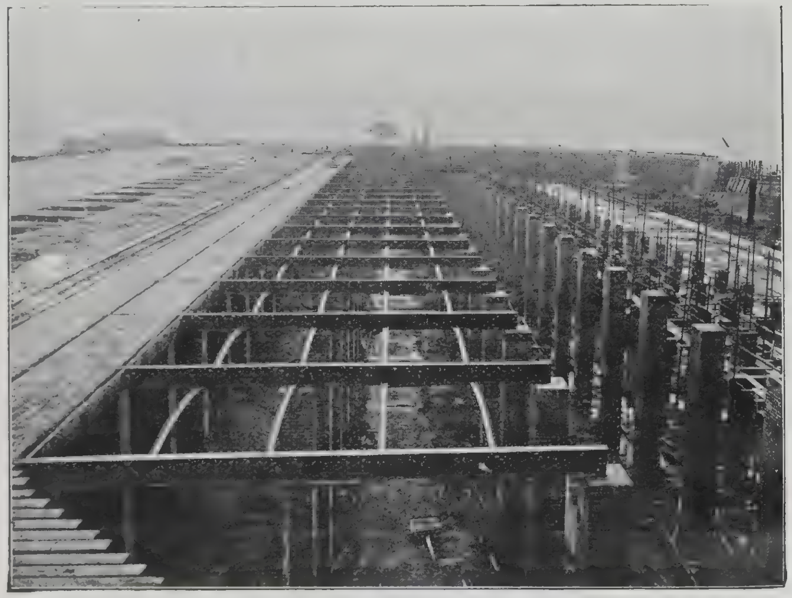
NEW GARAGE AND WAREHOUSE ROOMS, JOHN BRIGHT STREET, BIRMINGHAM. MARCUS O. TYPE, A.R.I.B.A., ARCHITECT.

(Kahn reinforcement.)


NEW GARAGE AND WAREHOUSE ROOMS
JOHN BRIGHT STREET BIRMINGHAM
PLANS
LAVATORIES
LIFT
DOWN
UP
WAREHOUSE
BEAMS OVER
LADIES ROOM
FIRST FLOOR PLAN
(2ND AND 3RD FLOORS SIMILAR)
AREA
PRINCIPALS OVER
LAVS
YARD
MOTOR GARAGE
DOWN
LIFT
BEAMS OVER
HYDRAULIC LIFT
OFFICES
HALL
SHOW ROOM
ENTRANCE
JOHN BRIGHT STREET
EXIT
GROUND FLOOR PLAN
5 0 10 20 30 40 50
SCALE OF FEET
BEAMS OVER
CAR STORE
HYDRAULIC LIFT
CAR STORE
LAVATORIES
HEATING CHAMBER
BASEMENT PLAN
DECEMBER 1909
MARCUS O. TYPE A.R. B.A.
ARCHITECT & SURVEYOR
87 EDMUND ST B'HAM

Reinforced Concrete Foundations and Lining.
RESERVOIR AT WHALEY BRIDGE. FRED OAKES AND SONS, ENGINEERS.

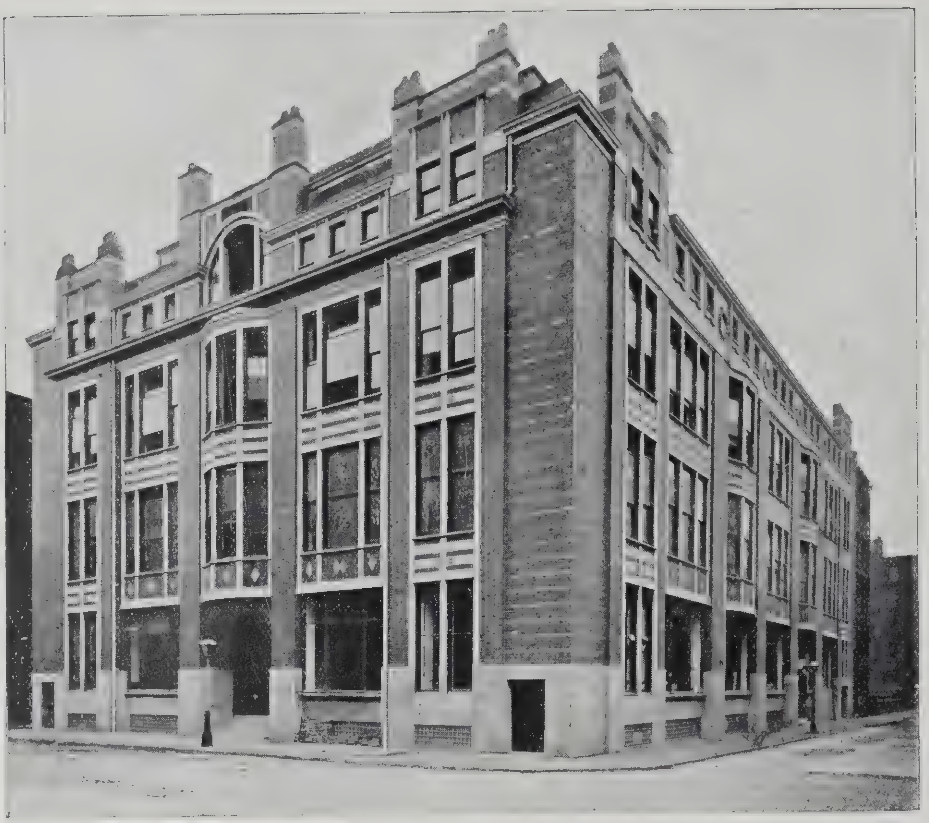
Reinforced concrete barrel roofs and domes.
OLDKNOW ROAD SCHOOLS, BIRMINGHAM. BUCKLAND AND HAYWOOD-FARMER, ARCHITECTS.



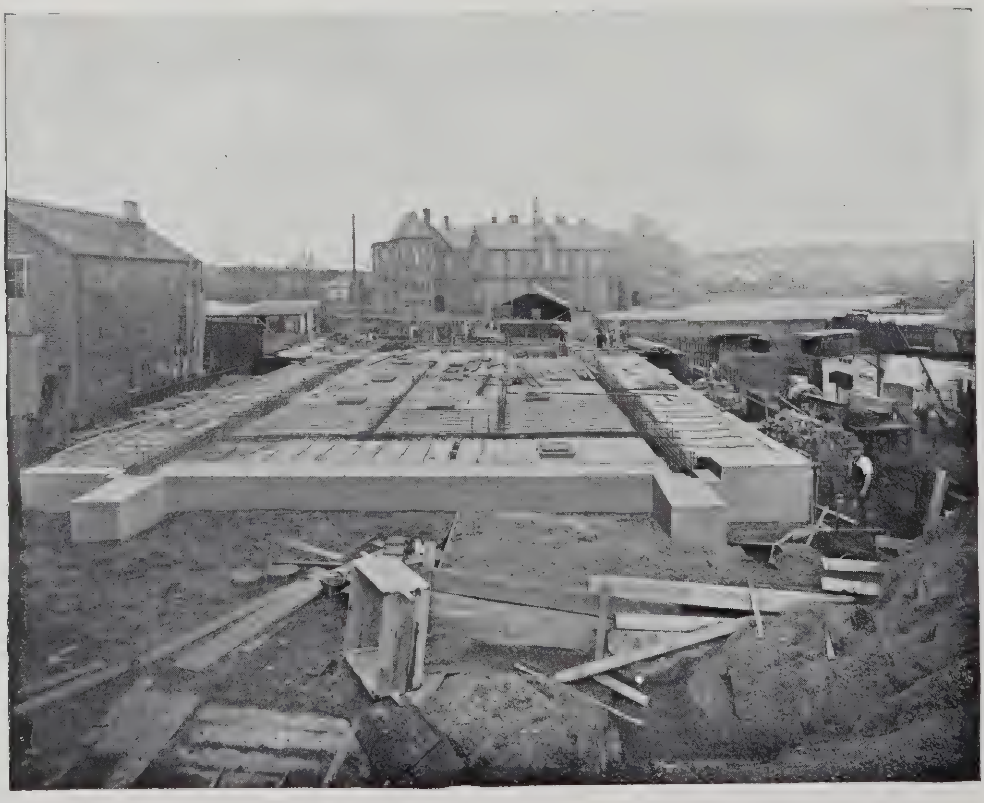
Reinforced Concrete Cover, 624 ft. by 360 ft.
DERWENT AQUEDUCT, AMBERGATE RESERVOIR. E. SANDEMAN, M.Inst C.E., ENGINEER.

Reinforced Concrete Ponds, Bridges, Retaining Walls, Flooring, etc.
SALFORD PUBLIC BATHS. MAGNALL AND LITTLEWOOD, ARCHITECTS.

(Expanded Metal Reinforcements.)



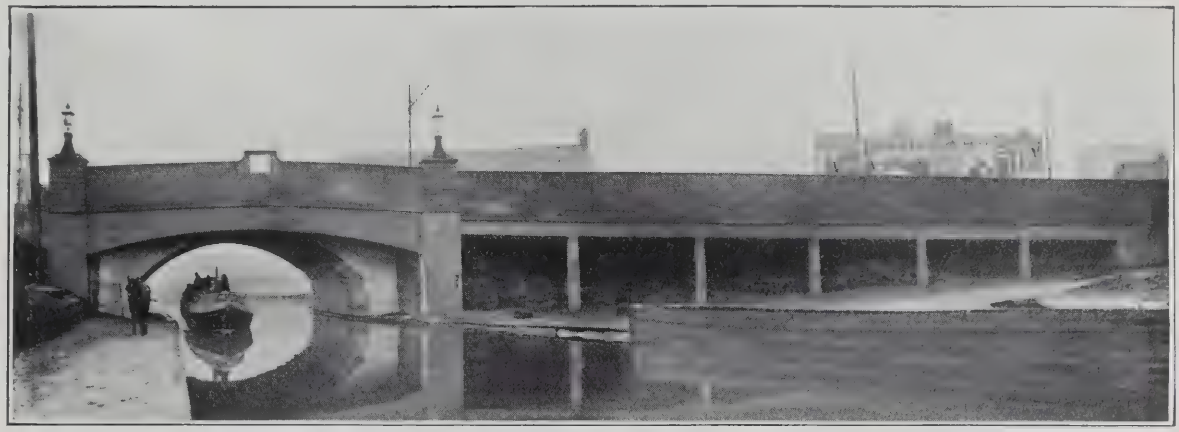
MANCHESTER TELEPHONE EXCHANGE. LEONARD STOKES, F.R.I.B.A., ARCHITECT.



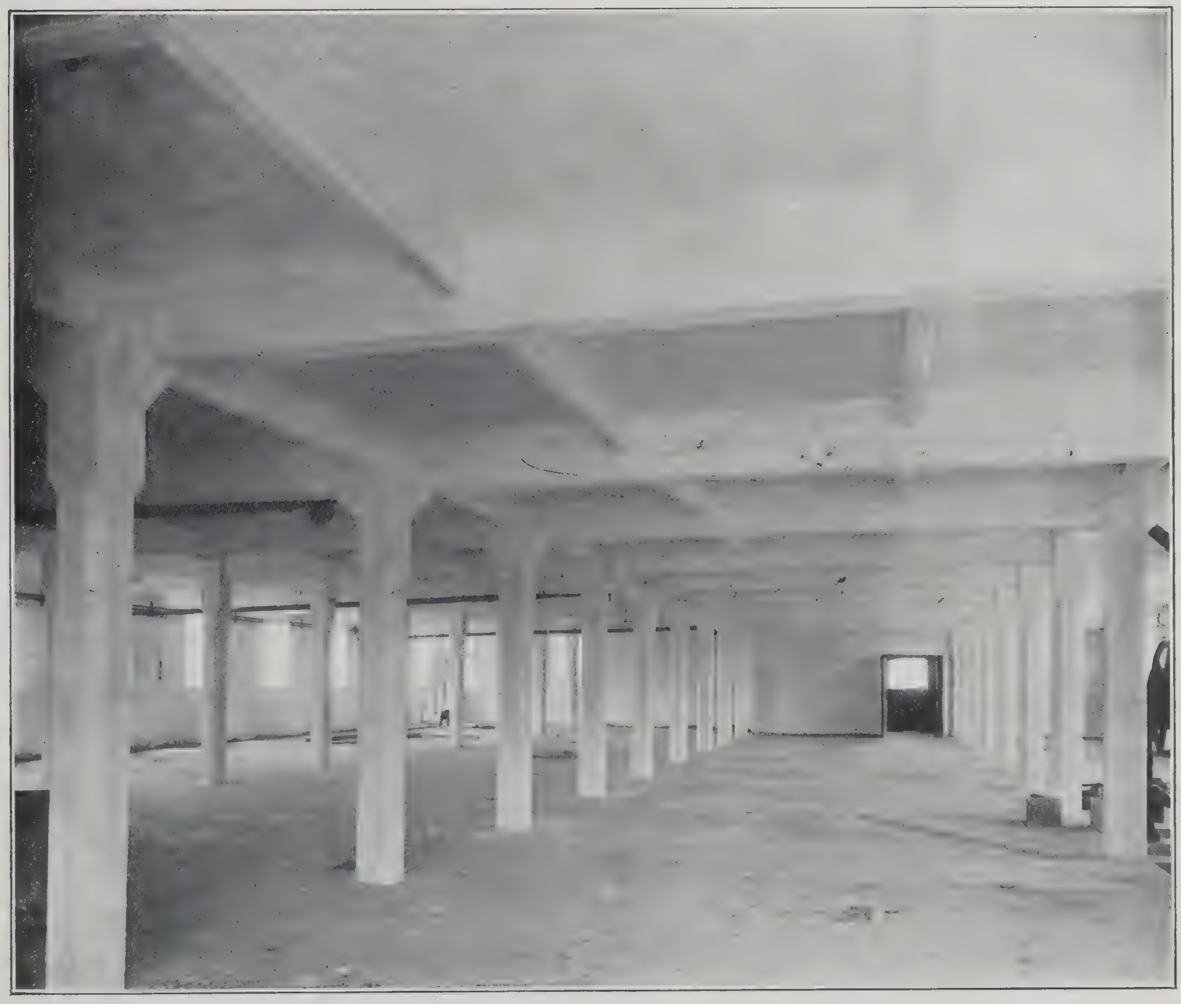
NEW BARNET CHURCH.

The whole of the foundations, stanchions, beams, etc., of this building have been constructed in reinforced concrete.

(United Kingdom Fireproofing Company's Reinforcement.)

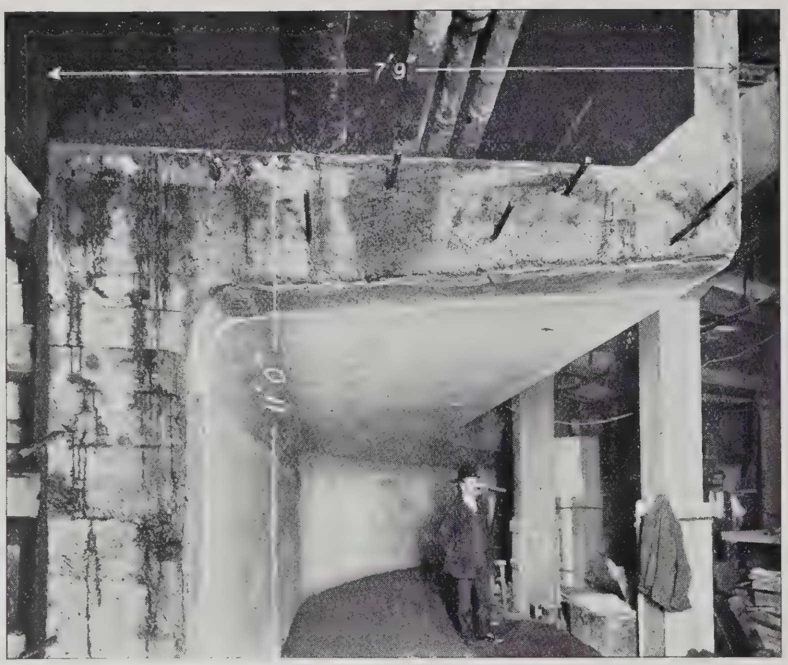


BRIDGE AND VIADUCT AT BROADHEATH.



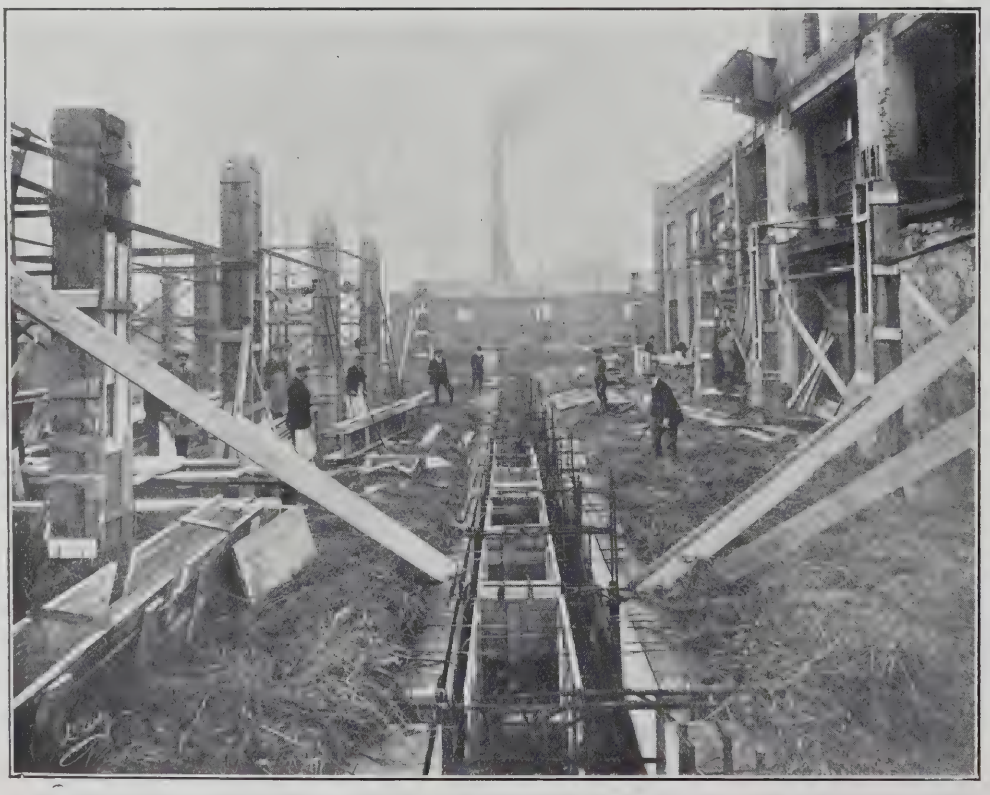
STORES FOR MESSRS. WHITBREAD AND CO., CHELSEA.

(Cubitt Concrete Construction Co., Contractors. Built with Saxon Portland Cement.)



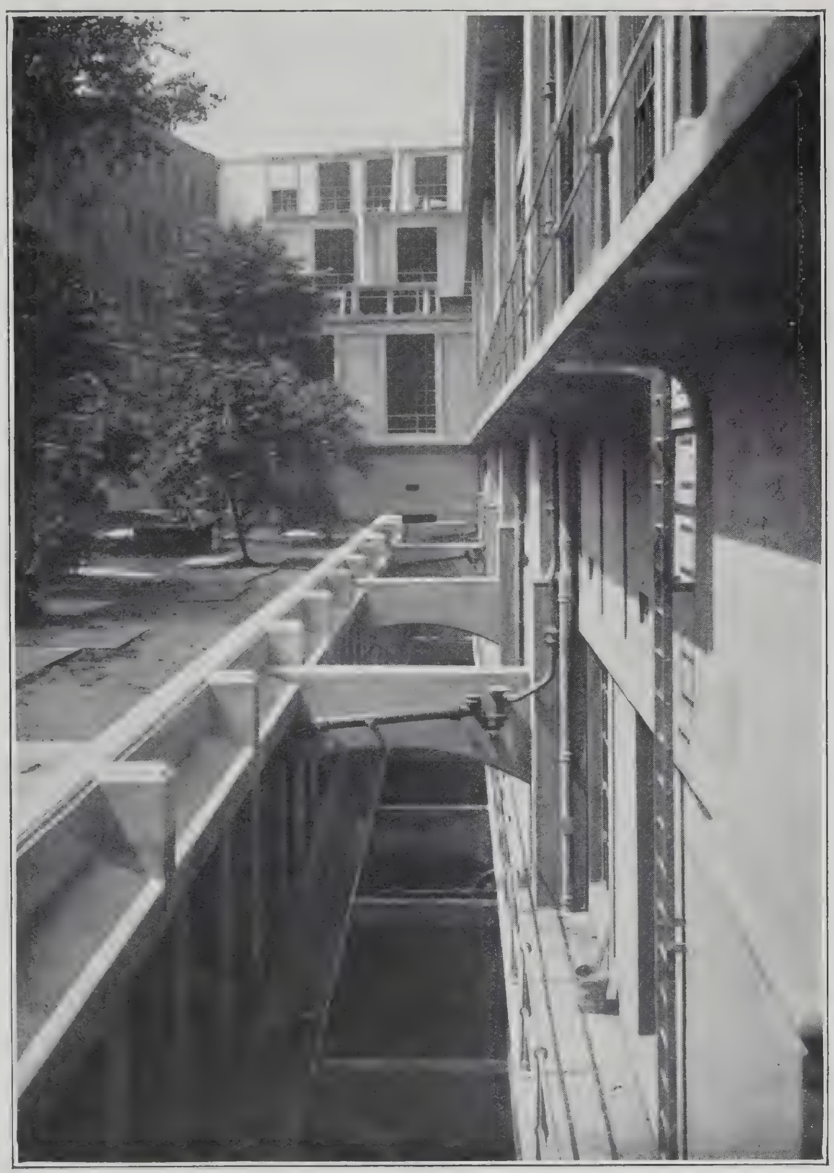
RETAINING WALL, MESSRS. MAPPIN AND WEBB'S PREMISES, CHEAPSIDE AND QUEEN VICTORIA STREET, LONDON, E.C. A. DREW, CONSULTING ENGINEER.

This retaining wall, only 14 in. thick, supports the exceptionally heavy motor traffic, etc., along Cheapside and Queen Victoria Street. The cantilever forms the sole support of pavement and all pipes, mains, etc.

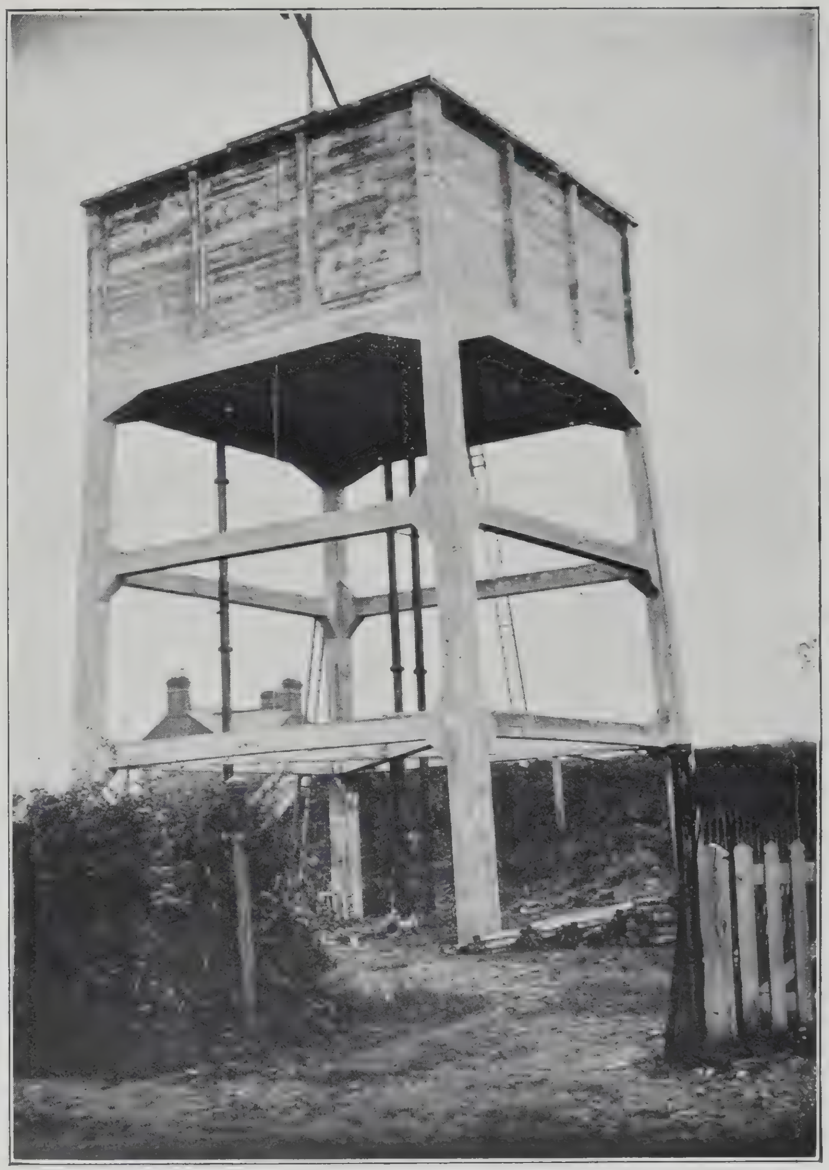


JAM FACTORY, DUBLIN, IN COURSE OF CONSTRUCTION FOR WILLIAMS AND WOODS, LTD. DONNELLY AND MOORE, ARCHITECTS.

The whole framework of the building, including four floors, flat roof, columns, balconies, and basement retaining walls, is constructed in reinforced concrete. The floors have been designed to carry very heavy loads, as much as 8 cwts., per foot super in one case. There is also a suspended gallery, and a tunnel is included in the scheme of reinforced concrete.
(Indented Bar Reinforcement.)

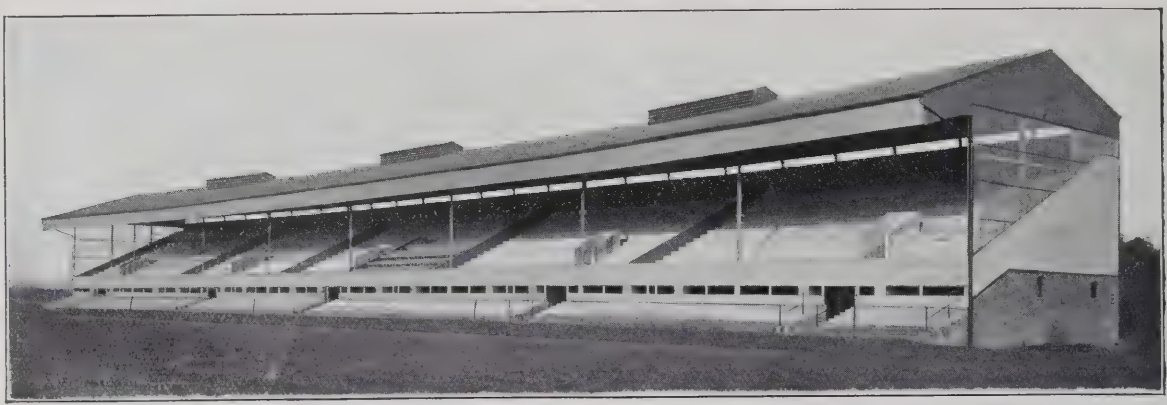


NEW GENERAL POST OFFICE BUILDING: SOUTH ELEVATION, SHOWING CANTILEVER BALCONIES AND SOUTH RETAINING WALL AND STRAPS.

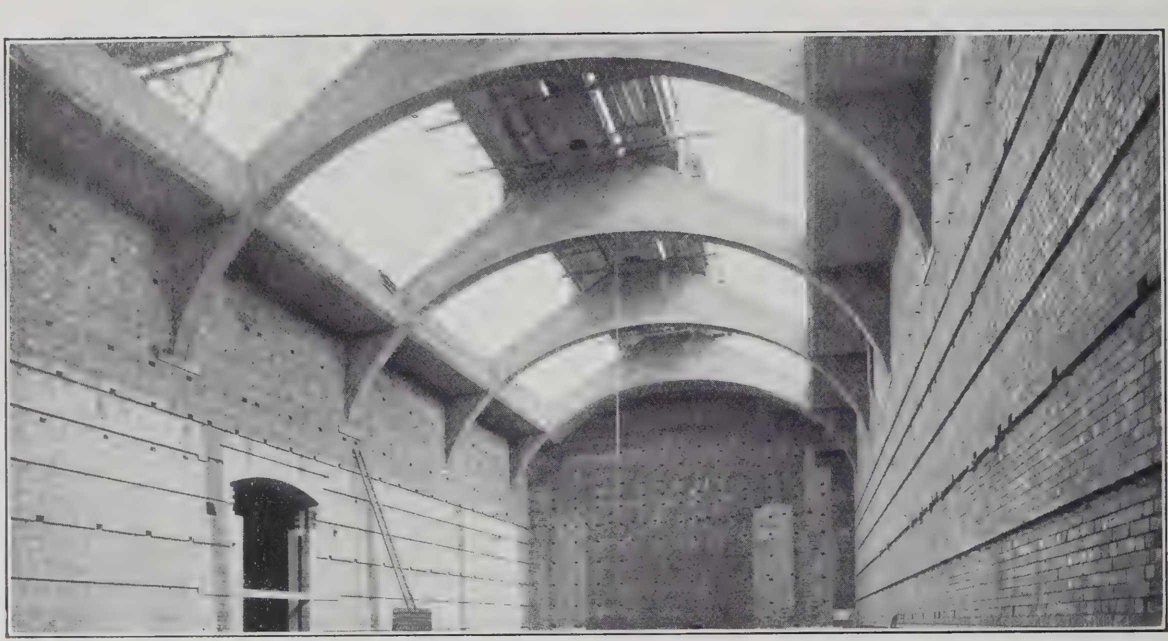


WATER TOWER, TO HOLD 30,000 GALLONS, FOR THE GREAT MARLOW WATER CO.

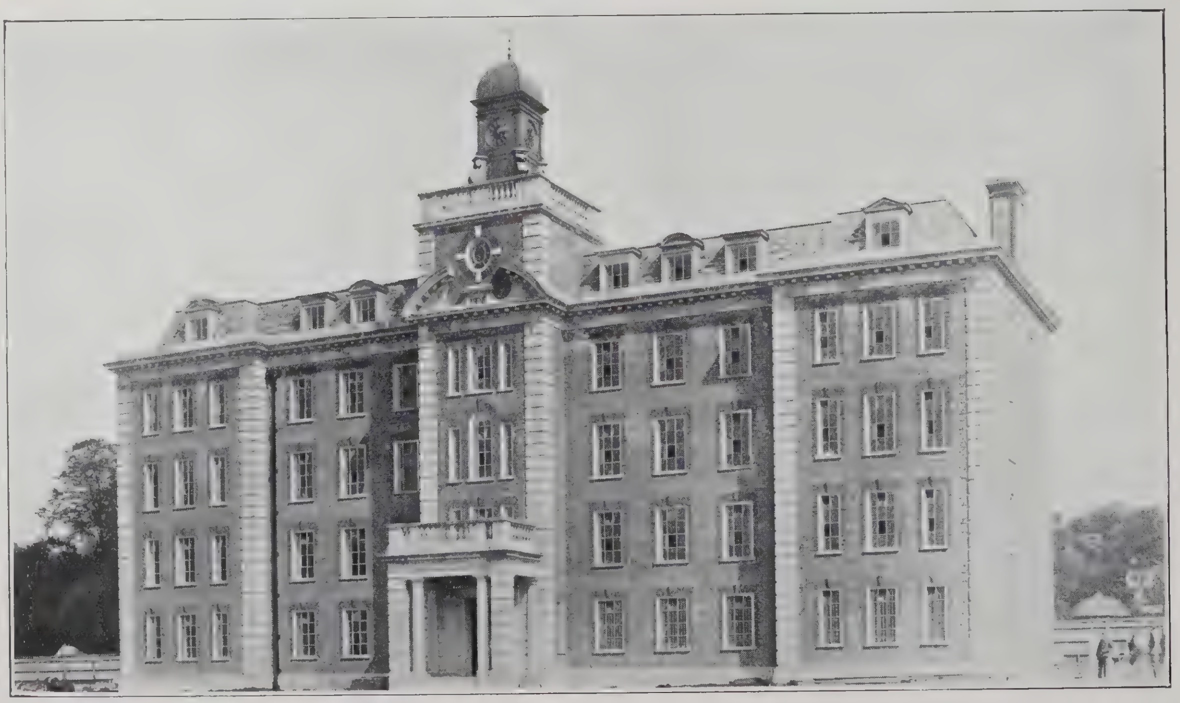
(Holloway Bros., **Ltd.**, **Contractors.**)



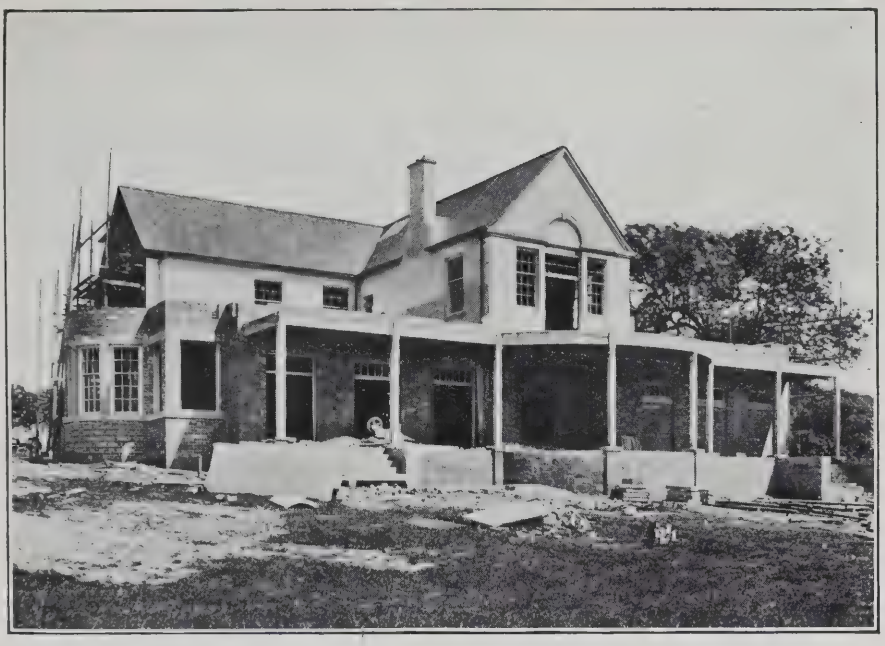
GRAND STAND FOR THE RUGBY FOOTBALL UNION, TWICKENHAM.



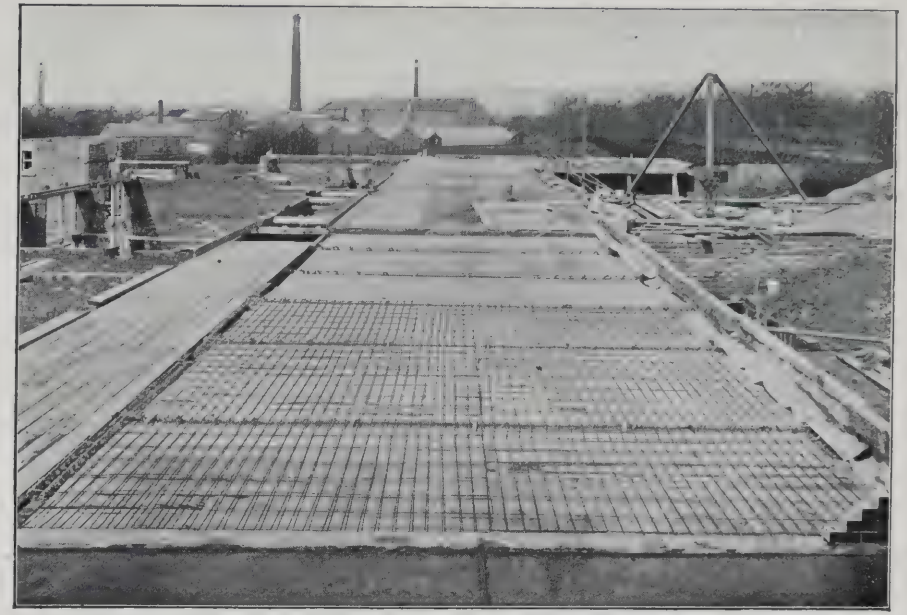
ROOF TRUSSES, NATIONAL GALLERY, LONDON.



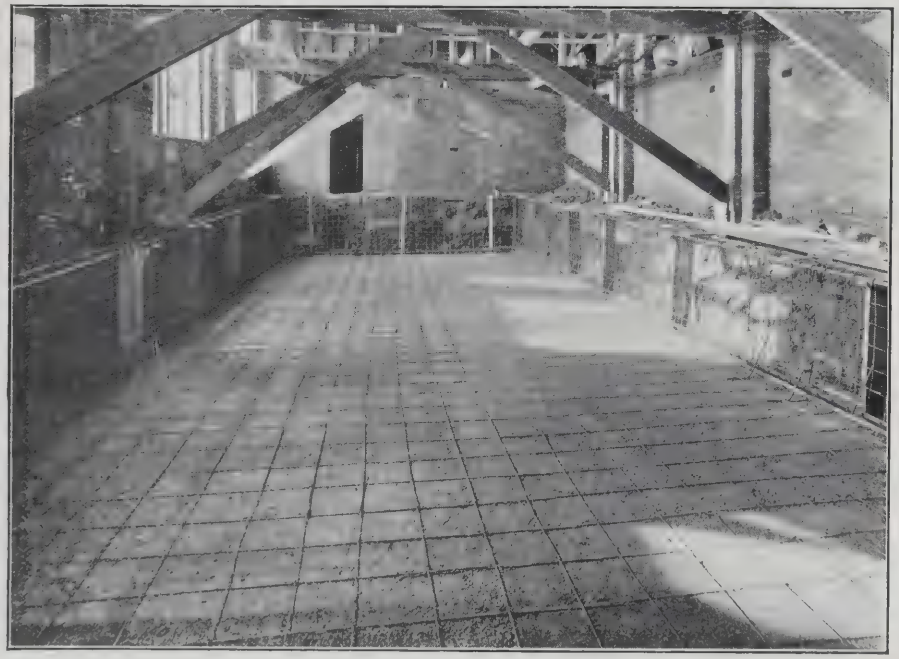
BANK OF ENGLAND RECORDS OFFICE, ROEHAMPTON. A. C. BLOMFIELD, F.R.I.B.A., ARCHITECT.
(Kahn Reinforcement.)



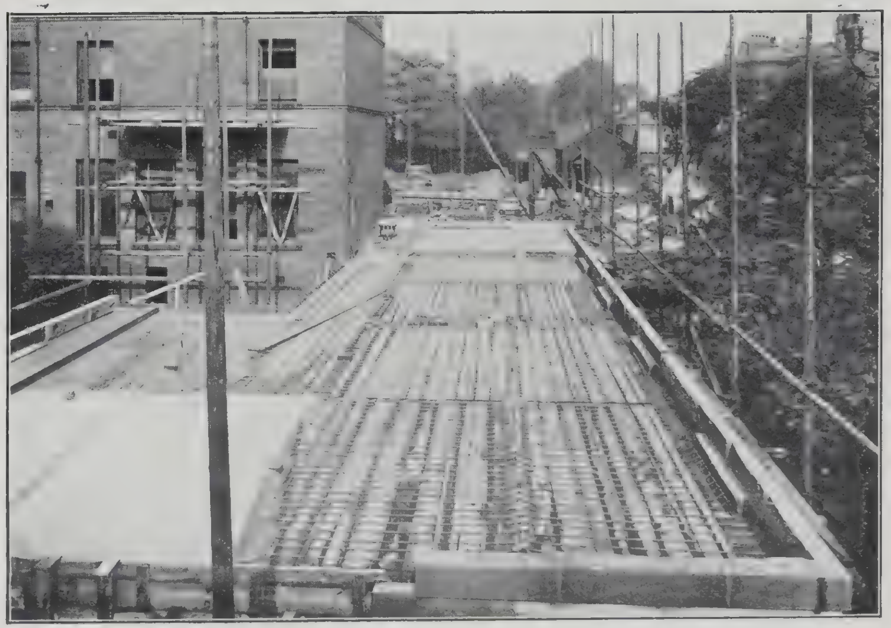
PAVILION FOR THE LEEDS GOLF CLUB, LTD. CARBY HALL AND DALBY, ARCHITECTS.



FLOOR, YEADON AND GUISELEY SCHOOL. W. BROADBENT, M.S.A., ARCHITECT.

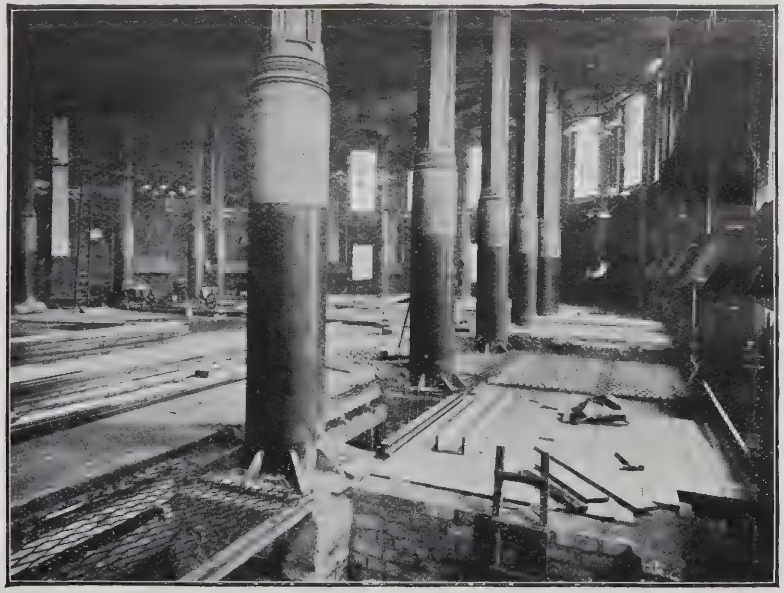


SWIMMING BATH, YEADON AND GUISELEY SCHOOL. W. BROADBENT, M.S.A., ARCHITECT.



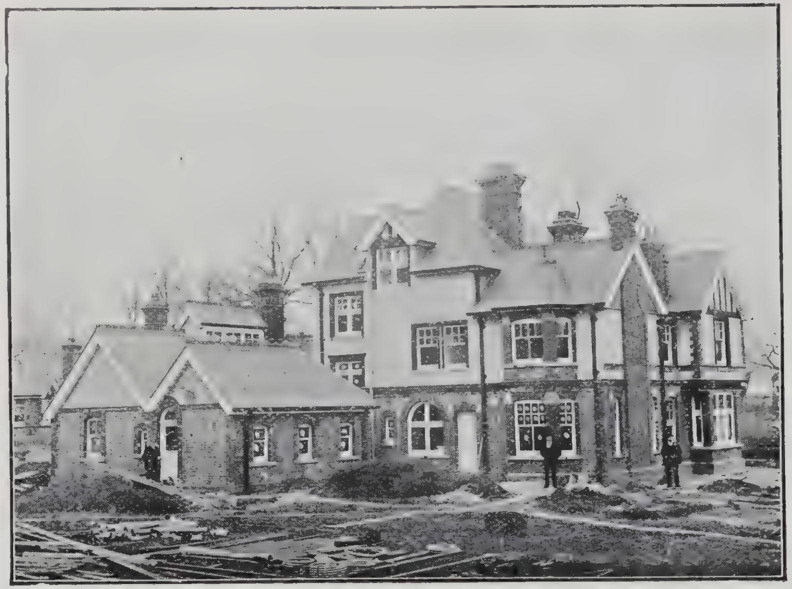
FLOOR, LEEDS MATERNITY HOSPITAL. SIDNEY D. KITSON, M.A., ARCHITECT.

(Henry Atkinson and Son, Contractors, Coignet Reinforcement.)

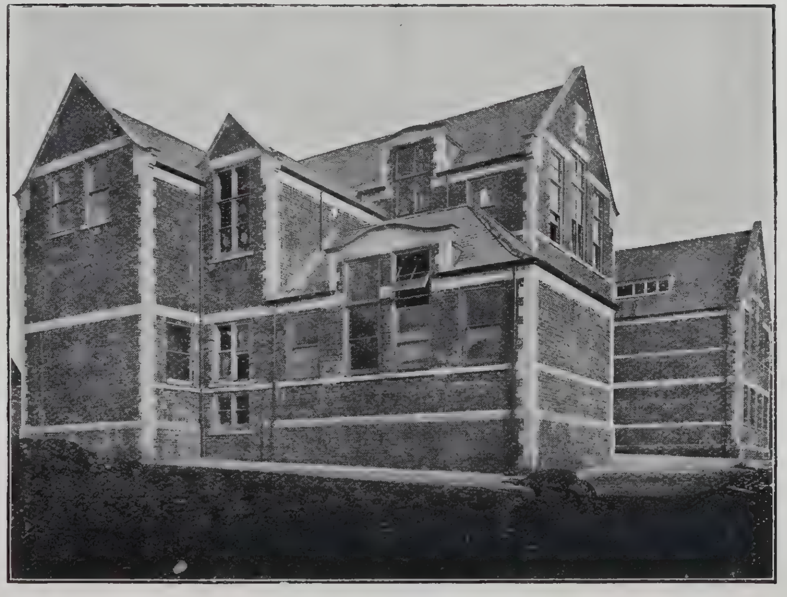


Reinforced Concrete Flooring

CENTRAL FREE LIBRARY, BIRMINGHAM. MESSRS. MARTIN, ARCHITECTS.

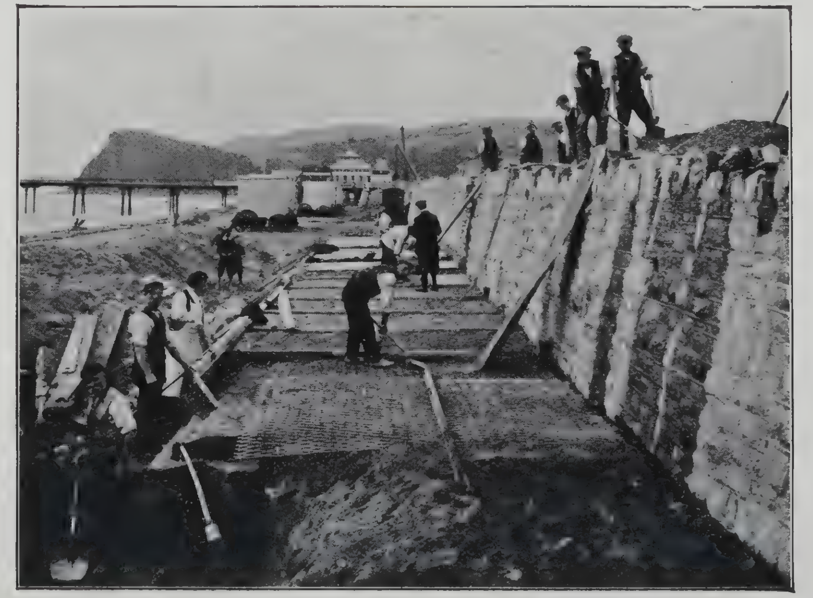


CHESHUNT ISOLATION HOSPITAL. R. H. JEFFS, A.M.I.C.E., ENGINEER.



Reinforced Concrete Flooring.

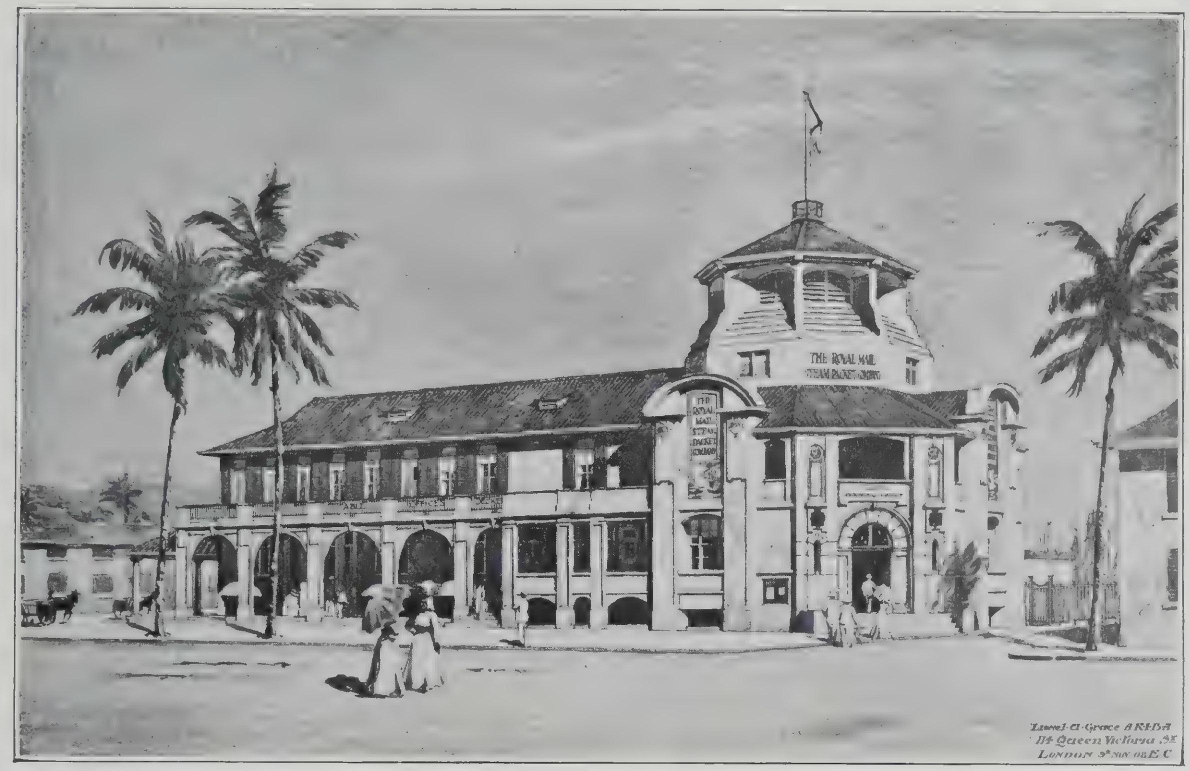
HELES SCHOOLS, EXETER. WARE AND SON, EXETER, ARCHITECTS.



Reinforced Concrete Promenade.

TEIGNMOUTH SEA DEFENCE WORKS. C. F. GETTINGS, ENGINEER.

(Expanded Metal Reinforcement.)


THE ROYAL MAIL STEAM PACKET COMPANY
THE ROYAL MAIL STEAM PACKET COMPANY
Lionel U. Grace ARIBA
114 Queen Victoria St
London 3rd Nov 08 E.C

ROYAL MAIL STEAM PACKET CO.'S PREMISES, KINGSTON, JAMAICA. LIONEL U. GRACE, A.R.I.B.A., ARCHITECT.

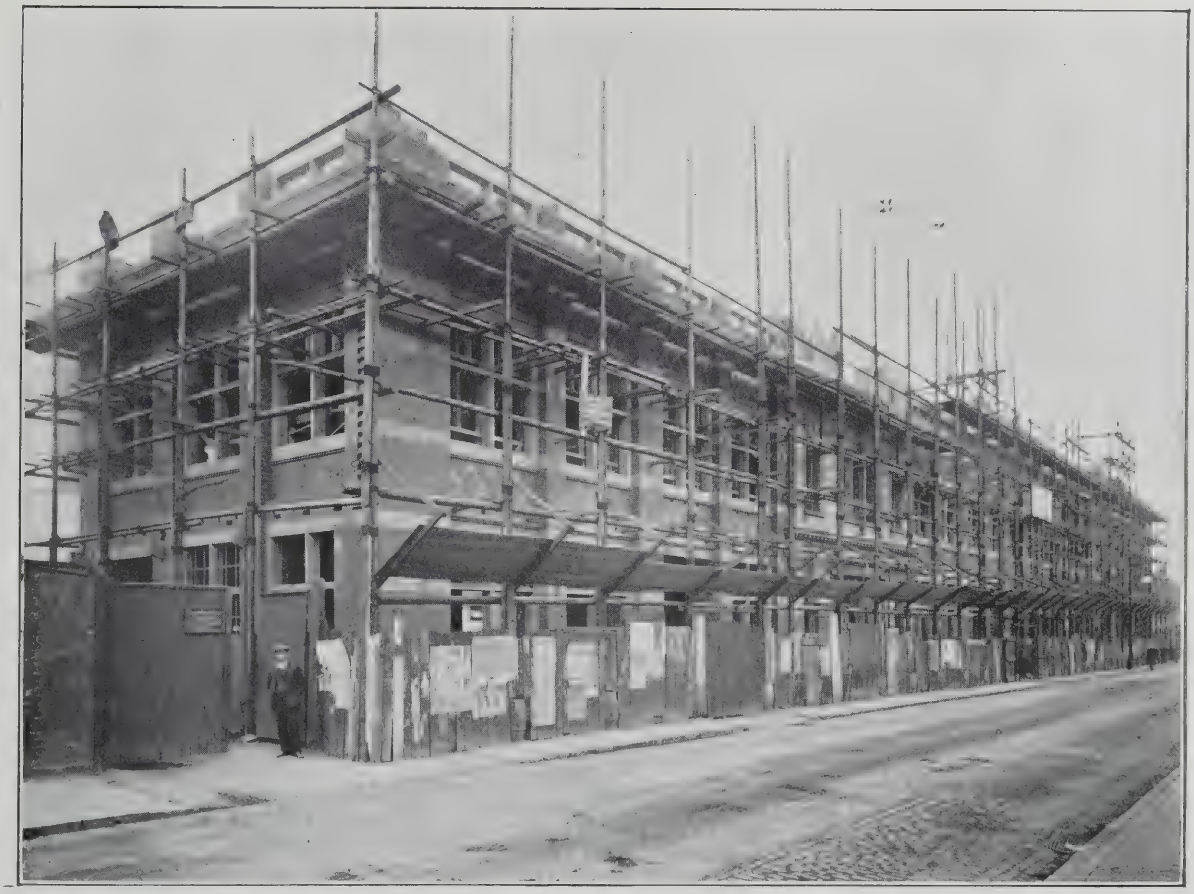
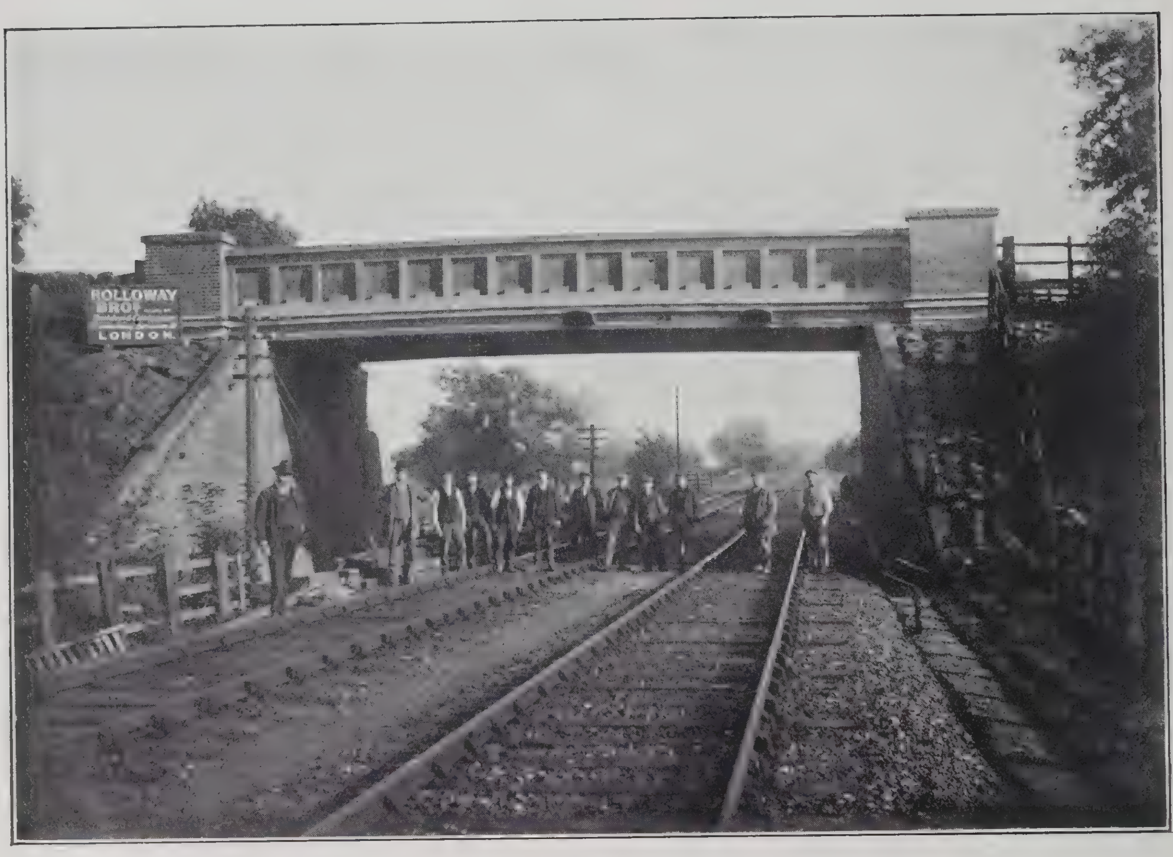
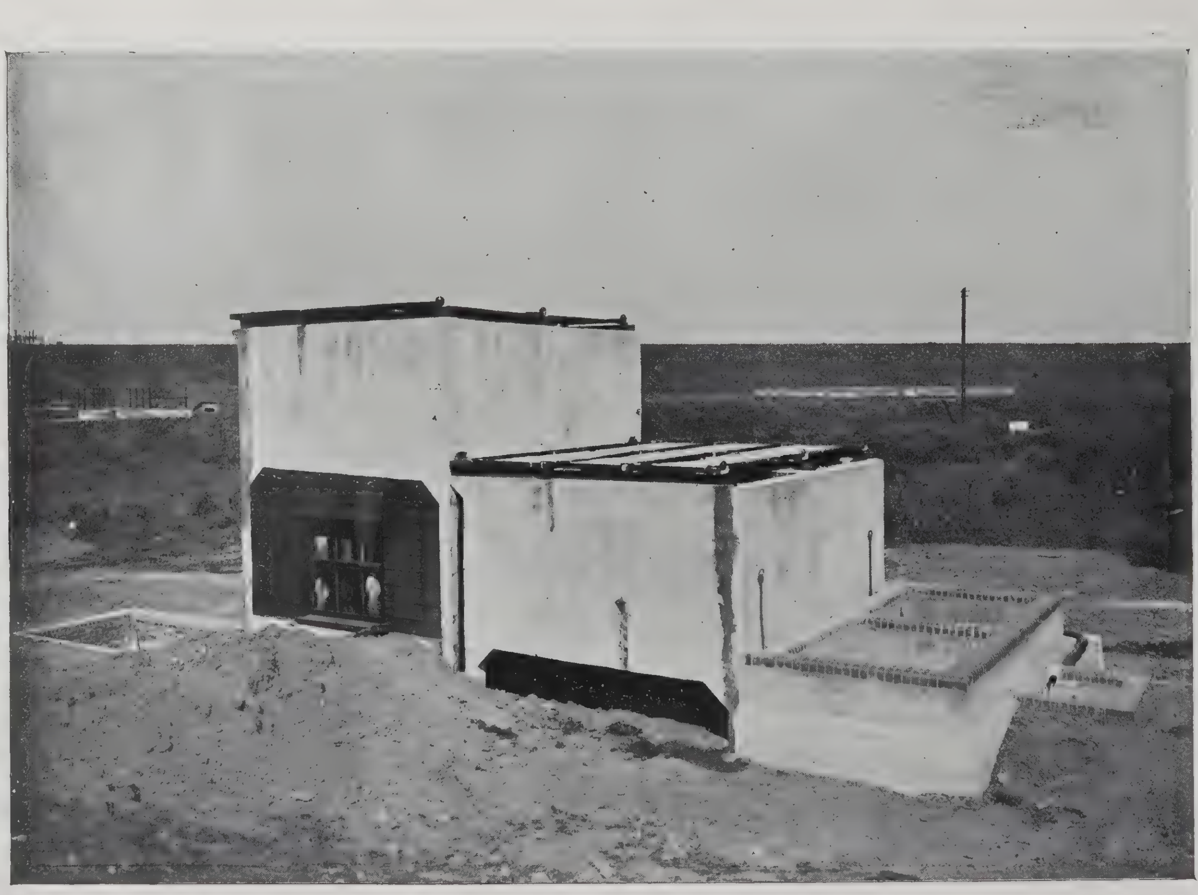


Photo: T. Lewis.

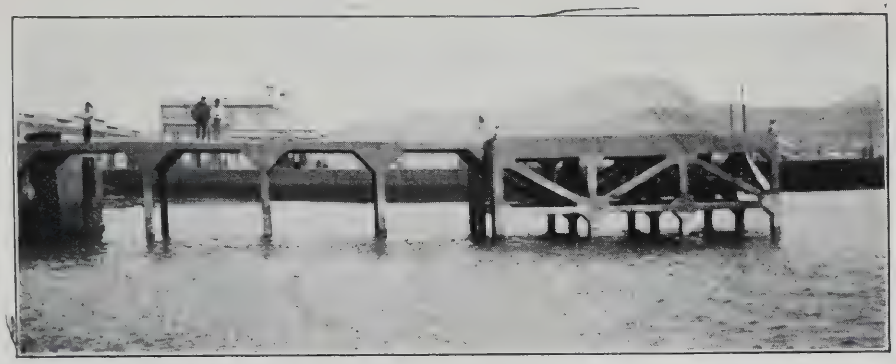
EXTENSION OF WORKS, DUNLOP RUBBER CO., ASTON, BIRMINGHAM.
(The Empire Stone Co., Ltd., Contractors.)



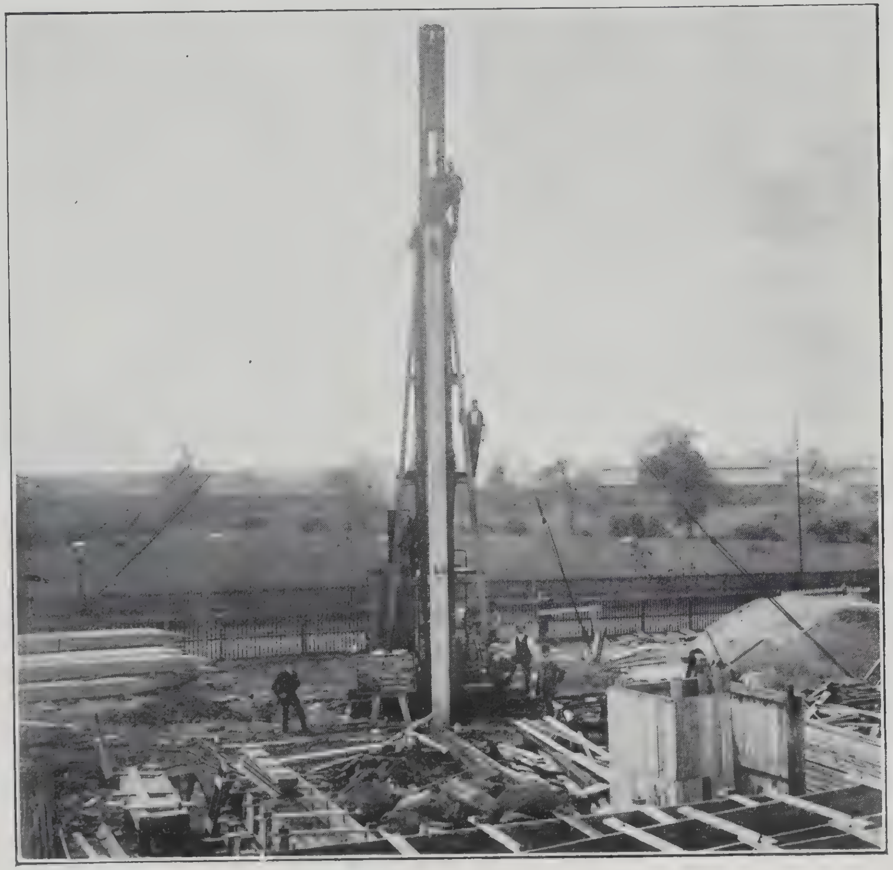
BRIDGE OVER THE LONDON AND SOUTH-WESTERN RAILWAY.
(Holloway Bros., Ltd., Contractors.)



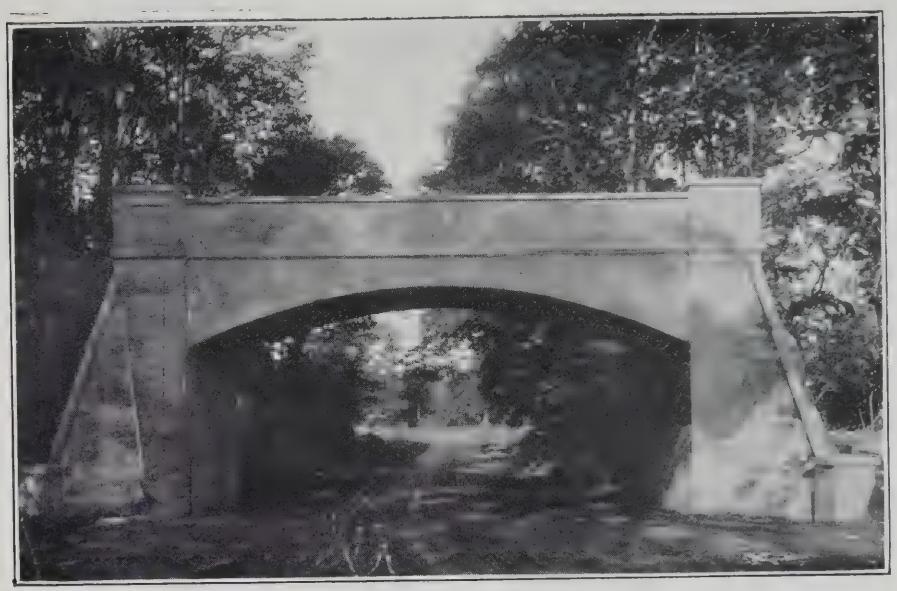
TANK AT KEMPTON PARK FOR THE METROPOLITAN WATER BOARD. W. B. BRYAN, M. Inst. C.E., CHIEF ENGINEER.
(Leslie and Co., Ltd., Contractors.)



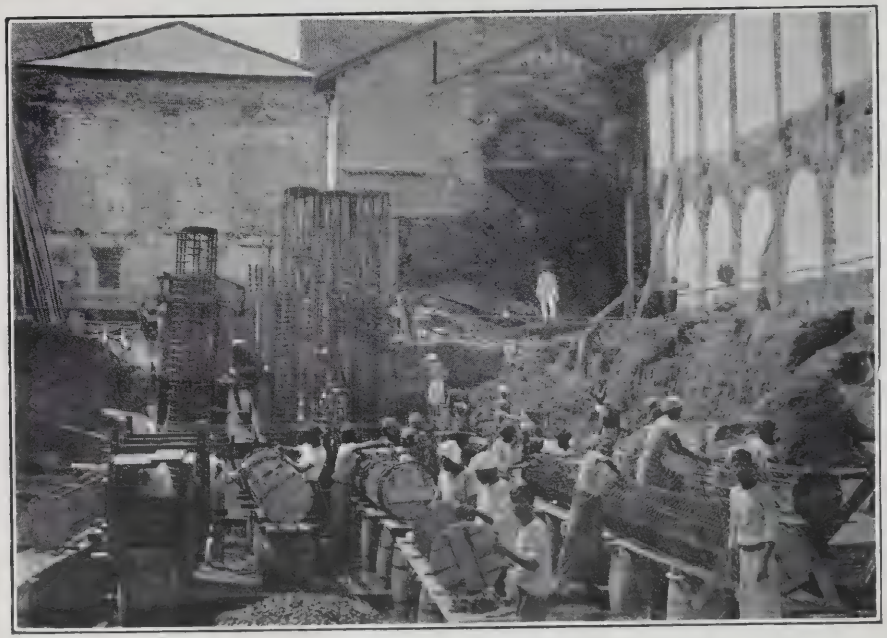
PIER, LAS PALMAS.



DRIVING KAHN PILES.

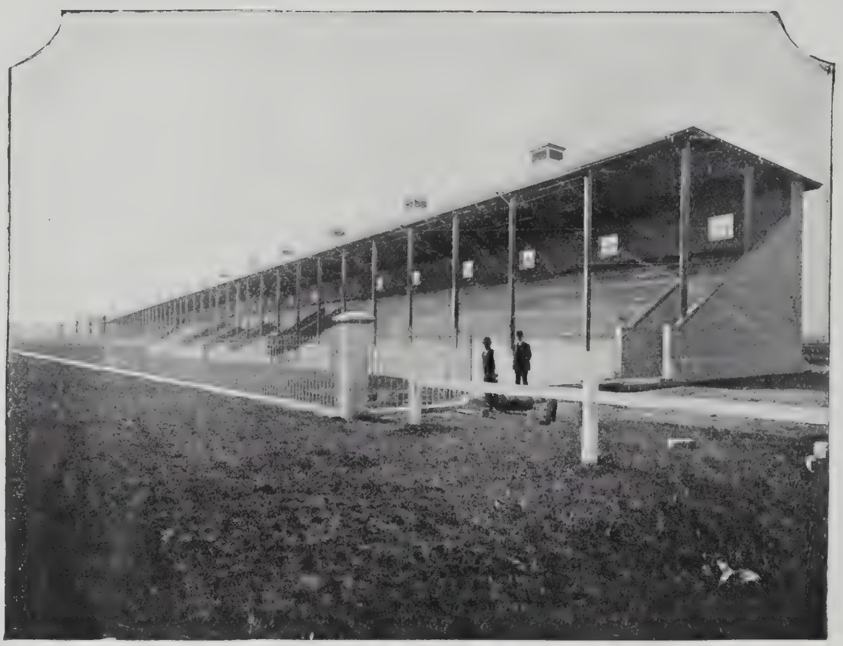


MOORTOWN BRIDGE.

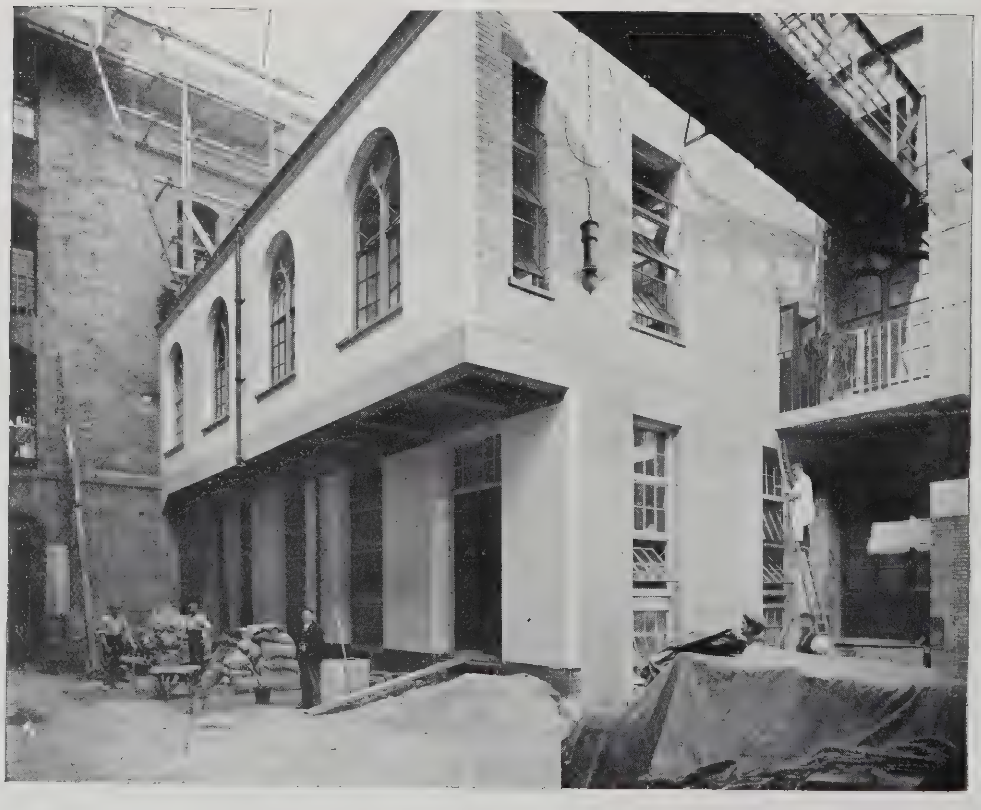


WAREHOUSE AT COLOMBO.

(Kahn Reinforcement.)



STAND, DONCASTER RACECOURSE.



COCOA FACTORY FOR MESSRS. JAMES EPPS AND CO. EDWIN T, HALL. F.R.I.B.A.
The floors of this building were tested up to 6 cwt. per foot with only ⅛ in. deflection.
(United Kingdom Fireproofing Co.'s System.)

Expanded metal reinforcement throughout.

QUEEN'S THEATRE, DUBLIN. R. T. STIRLING, DUBLIN, ARCHITECT

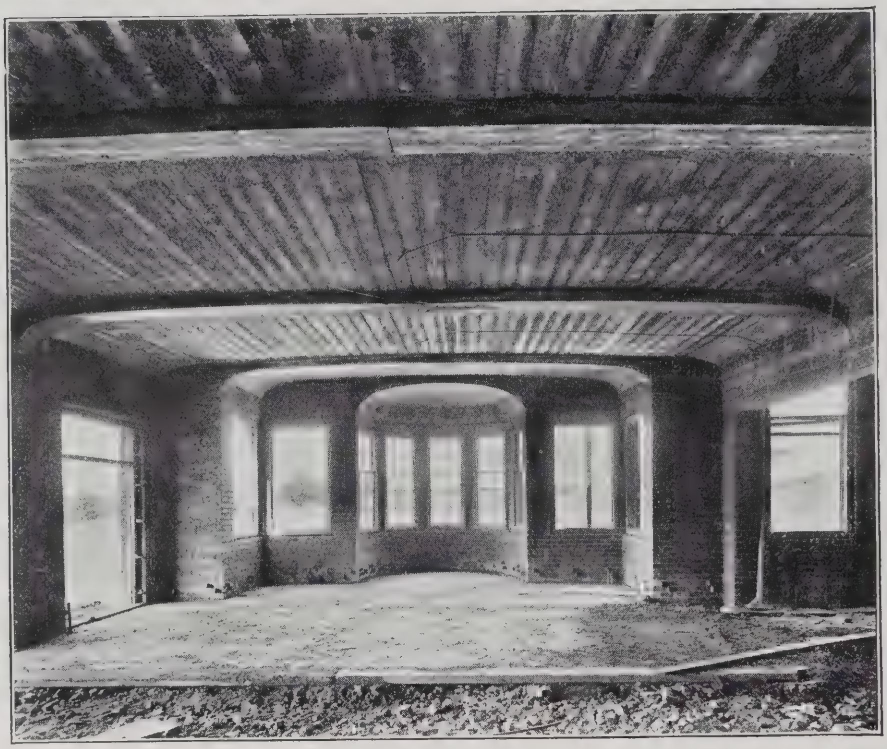
Reinforced concrete walling.

MESSRS. ISAAC ANDREWS AND SONS GRAIN STORES, BELFAST
SPENCER AND CO., MELKSHAM, ENGINEERS.

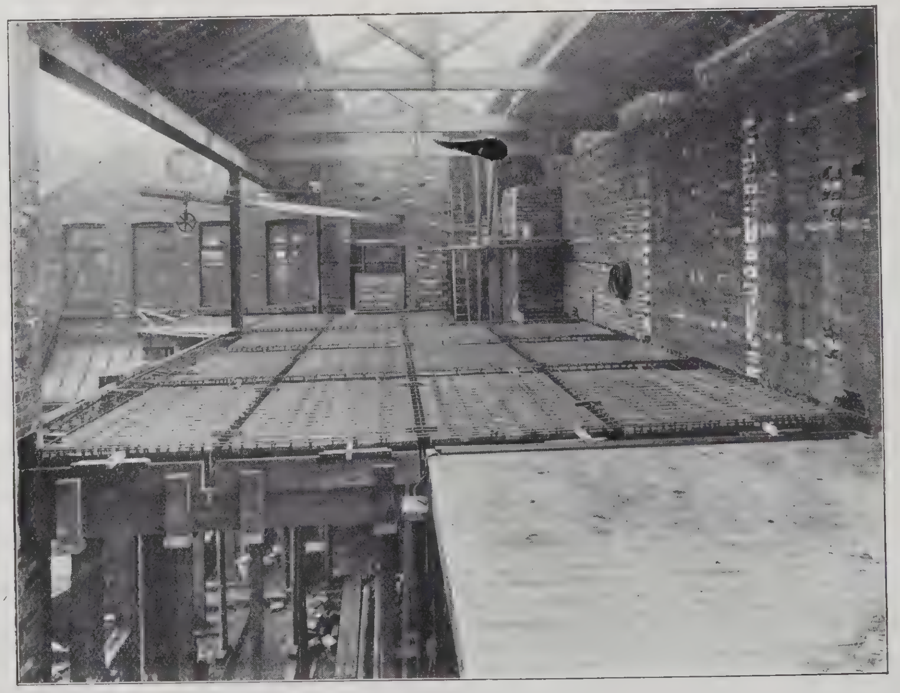
Reinforced concrete decking.

WALNEY ISLAND BRIDGE. THE LATE SIR BENJAMIN BAKER, ENGINEER.

(Expanded Metal Reinforcement.)

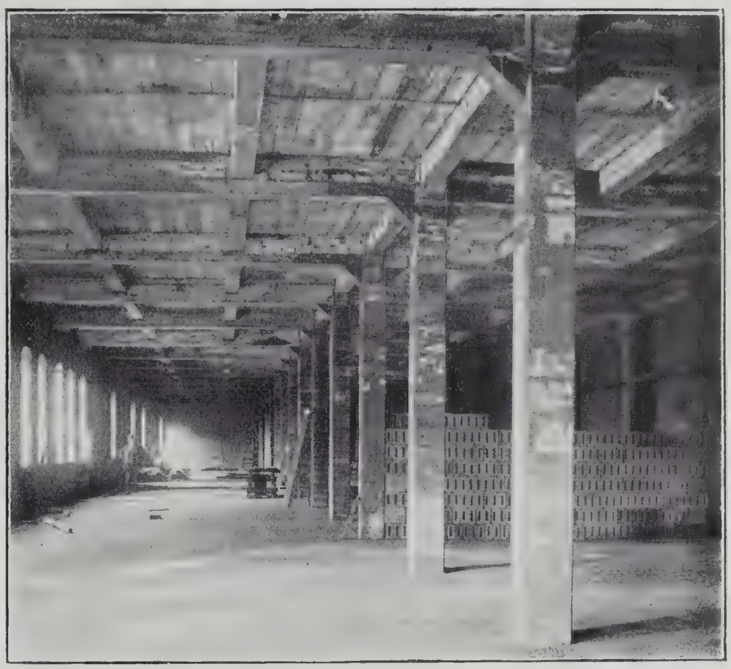


INTERIOR OF PAVILION FOR THE LEEDS GOLF CLUB, LTD. CARBY HALL AND DALBY, ARCHITECTS.

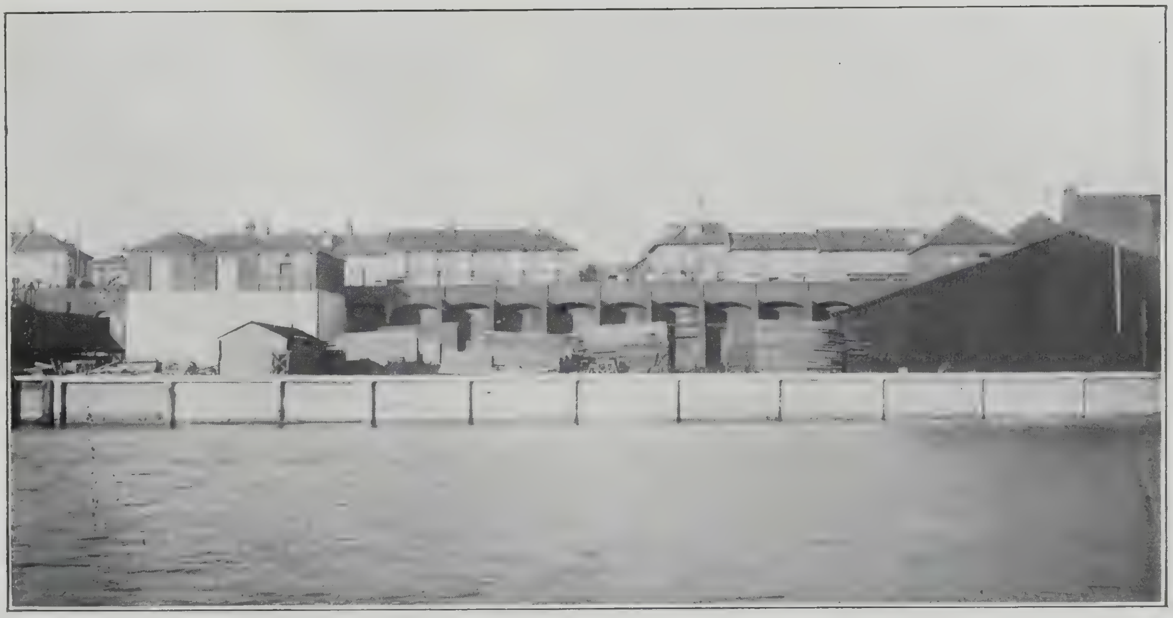


WORKSHOPS FOR HENRY ATKINSON AND SONS, LEEDS.

(Henry Atkinson and Sons, Contractors. Coignet Reinforcement.)

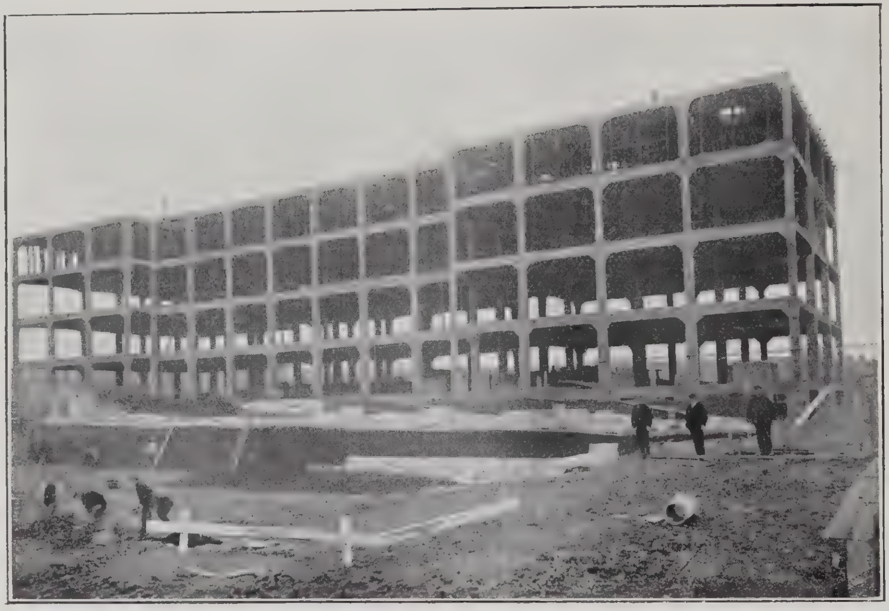


INTERIOR KODAK FACTORY, WEALDSTONE



WHARF AT PORTSLADE.

(D. G. Somerville & Co., Contractors.)



BIRMINGHAM TELEPHONE EXCHANGE.

(ubitt Concrete Construction Co., Contractors. Built with Saxon Portland Cement.)

PANTON STREET BREWERY, CAMBRIDGE.

(Floors by the United Kingdom Fireproofing Co. Spans 24 feet.)

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